

Searchable multi-dimensional Data Lakes supporting Cognitive Film Production & Dis- tribution for the Promotion of the European Cultural Heritage

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involvement and impact on the SSH aspects**

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Abbreviations

Abbreviations	Full name
AAPS	AI-based Audience Preferences Scouting tool
ABT	Audience Building Tool
AI	Artificial Intelligence
CCI	Cultural and Creative Industries
CDSM	Copyright in the digital single market
CFR	EU Charter of Fundamental Rights
EU	European Union
GenAI	Generative AI
GDPR	General Data Protection Regulation
GPA	General-purpose AI
LDMA	Literary, dramatic, musical and artistic works
ML	Machine learning
NEB	New European Bauhaus
NLP	Neuro-linguistic programming techniques
SCENE	Searchable multi-dimensional Data Lakes supporting Cognitive Film Production & Distribution for the Promotion of the European Cultural Heritage
SSH	Social Science and Humanities
T	Task
5IR	Fifth Industrial Revolution
UDHR	Universal Declaration of Human Rights
UNESCO	United Nations Educational Scientific and Cultural Organization
WP	Work Package
CGI	Computer Generated Imagery
GenAI	Generative Artificial Intelligence



Publishable summary

This deliverable has two main purposes. The first one concerns the promotion of fair working conditions of the cultural and creative industries sector. The second has to do with demonstrating the benefits of including the social sciences and humanities (SSH) sector in technological projects. In both cases with special attention their implications into the defined users of the SCENE platform and functionalities.

In relation to what concerns fair working conditions, the deliverable provides a definition of fair working conditions in accordance with the European legal framework. That framework refers to EU laws and regulations that promote fair working conditions, including directives on transparent employment terms, working time limits, and anti-discrimination, as well as foundational documents like the Charter of Fundamental Rights and the European Pillar of Social Rights applicable to all sectors of work. From here it focuses on the sector of cultural and creative industries in which the users of the SCENE platform are framed. The deliverable helps to highlight how the SCENE project can promote fair working conditions in the sector, serving as a reference to promote the realization of similar projects to promote and benefit the sector. Document also includes a dedicated section for analyzing the impact of AI in the filmmaking sector and jobs roles.

And according to the introduction of the *Social Science and Humanities (SSH) aspects* into technological projects and platforms, the document recapitulates the study of all SSH aspects that affect the CCI sector with special attention to the filmmaking industry to make suggestions for improving the working conditions and integrating SSH aspects. To this end, the recommendations of the New European Agenda for Culture adopted by the European Commission in May 2018, the EU Gender Equality Strategy 2020-25 adopted on 5 May 2020, as well as other more recent Commission instruments, have been taken into account.



1 Introduction

1.1 Purpose, context and scope of the document

This deliverable has two main purposes. The first one concerns the promotion of fair working conditions of the cultural and creative industries sector as users of SCENE. The second has to do with demonstrating the benefits of including the social sciences and humanities (SSH) sector in technological projects such as the SCENE project.

In relation to the first objective, which concerns fair working conditions, the deliverable provides a definition of fair working conditions in accordance with the European legal framework¹ applicable to all sectors of work. From here it focuses on the sector of cultural and creative industries in which the users of the SCENE platform are framed, as set out in the project, as well as those detected in deliverable *D.2.2. End-user needs & requirements.R1*. The deliverable will help to highlight how the SCENE project can promote fair working conditions in the sector, serving as a reference to promote the realization of similar projects to promote and benefit the sector.

Regarding the second objective, related to the inclusion of the social sciences and humanities sector in technological projects such as SCENE, the deliverable is focused on identifying the benefits of integrating SSH perspective and the arts into economic and social regeneration strategies to increase the competitiveness of the sector, its opportunities and equalize the working conditions.

In short, the deliverable summarizes the work carried out within the framework of the task *T2.3. Fair working condition requirements & SSH aspects*, with the objectives to study all SSH aspects that affect the filmmaking industry to make suggestions for improving the working conditions and integrating SSH aspects. To this end, the recommendations of the New European Agenda for Culture adopted by the European Commission in May 2018, the EU Gender Equality Strategy 2020-25 adopted on 5 May 2020, as well as other more recent Commission instruments, have been taken into account. Furthermore, within the framework of task *T2.3.*, collaboration and knowledge transfer between the new developments, proposed in SCENE, and the social sciences and humanities sector have been promoted through a qualitative and participatory approach.

1.2 Relationship with other deliverables

As this deliverable plays a transversal role in the SCENE project, it is related to other reports within the framework of this project (reported in the following bullet points), ensuring that dimensions such as social sciences and humanities and the working conditions of the sector, i.e., of the SCENE project users, are taken into account.

- **Deliverable *D.2.2. End-user needs & requirements. R1***: As this deliverable identifies the stakeholders who are engaged with the platform to understand their needs and determine the requirements, i.e., production companies, location managers and art directors. *D.2.4* then draws directly from this knowledge to detect the working conditions of these film industry professionals, who themselves

¹ The *European legal framework* refers to EU laws and regulations that promote fair working conditions, including directives on transparent employment terms, working time limits, and anti-discrimination, as well as foundational documents like the Charter of Fundamental Rights and the European Pillar of Social Rights. Access via: <https://eur-lex.europa.eu/>





belong to the cultural and creative industries sector. In addition, deliverable D.2.2. highlights the challenges and needs that each of these professionals faces when approaching their work.

- **Deliverable D.5.4. Recommendations & validation of the NEB values. R1:** Deliverable 5.4 sets out a general framework for partners in relation to the New European Bauhaus, its values and principles: the idea of creating a sustainable, inclusive, and aesthetically appealing future for Europe. D.5.4 offers a series of general recommendations for the SCENE project and for each of its modules with the aim of following the NEB principles: inclusion, sustainability and beauty. These concepts are not only related to the human dimension, easily addressed from the social sciences and humanities sector, but also from fair working conditions that, among others, follow the principles of inclusion and sustainability.
- **Deliverable D.2.2. End-user needs & requirements. R2:** As this deliverable is a revision and update of the *D.2.2. End-user needs & requirements. R1*, the updated information related to the user needs and requirements have been taken into account.

1.3 Structure of the deliverable D2.4

The deliverable 2.4 - *Report on the level of fairness in the working conditions and the level of involvement and impact on the SSH aspects* (D.2.4) serves as a complete guide to understand and apply the fair working conditions within the framework of the SCENE project, especially in the Cultural and Creative Industries (CCI) sector and its professionals, especially regarding the filmmaking industry and its professionals. As AI has impacted considerably the sector, the deliverable also provides an overview of its implications. In addition, the report serves as a framework to provide an overview of the benefits and impact associated with the inclusion of the social sciences and humanities sector in technological projects such as SCENE. The deliverable is organized into various sections that explore both the theoretical frameworks and the practical applications of the working conditions in relation to the objectives of the project. The document is composed of different sections, starting with an introductory one in which the object and the context are established, along with the relationship between the three resources of the SCENE project. It also introduces the structure of the document and provides background information on the objectives of the SCENE project.

The second section refers to the methodology followed for the preparation of this document.

The third section refers to the Fair Working Conditions and the CCI sector, offering a general definition of the fair working conditions in accordance with European regulations in this area, providing an overview of their relevance in the Cultural and Creatives Industries, centered especially in the film industry, relevant in the framework of the SCENE project and its users.

The fourth section focuses on providing a view of the main indicators such as diversity and inclusion, work-life balance, compensation, training and development, aspects that directly impact the CCI sector. Also discussed is the intersection between fair working conditions and technological innovations, offering practical guidance to ensure fair practices in an increasingly digitized environment.

The fifth section discusses Artificial Intelligence and how it affects the working environments and working conditions of professionals, specifically those working in the film industry. This section, which focuses on generative AI, explains how it affects each of the phases of a film and the roles and positions of workers in the sector.

The sixth section explores the relevance of SSH in technological projects with SCENE. It is detailed as to how the project is integrated, especially in relation to environmental sustainability and the values of the New



European Bauhaus (NEB). It also included a discussion of SCENE's impact on the community and society, as well as the ethical considerations involved in ensuring fair working conditions.

1.4 Background and objectives of the SCENE Project

SCENE is a project that promotes innovative, competitive and sustainable business models to address the challenges of the European film industry. To this end, it proposes a platform that makes it possible to analyze and evaluate all sub-sectors of the film industry, including pre-production, production, post-production and distribution sub-sectors, in order to help better understand the vulnerabilities of each sub-sector, mitigate risks, reduce waste of time, money and resources, minimize environmental impact and, in general, create a sustainable and innovative decision-making framework. In this sense, platforms such as SCENE promote and therefore impact the working conditions of the sector by including new dimensions, new knowledge and more opportunities.

To this end, SCENE takes advantage of the major impact of digital technology, which has penetrated the entire industrial chain of film production, including technologies using AI for preference analysis and audience creation, blockchain for IPR protection, simulation tools, etc.

And, on the other hand, of the growing interest in European Cultural Heritage not only as an asset to be protected and promoted, but as a significant, distinctive and attractive asset, especially for the film industry. To this end, through the SCENE platform, innovative tools are integrated (photogrammetry, 3D digital reconstruction, virtual simulations) to support and accelerate the film industry in a comprehensive manner, and the making of films at all stages, from pre-production to distribution.

In this sense, the inclusion of all these technologies has a great impact on the film industry and its professionals and, in turn, to address European Cultural Heritage from a purely technological perspective, the importance and need to include the dimension of social sciences and humanities (SSH) in this type of project such as SCENE and implementation of technologies.

2 Methodology

For this deliverable, a review of the European regulatory framework has been carried out to contextualize the concept of fair working conditions and improve its understanding and implications within the Consortium. On the other hand, the European framework also serves to better understand the cultural and creative industries sector and its vicissitudes. The objective is to provide Consortium members with the proper information to understand the overall framework, in order to have all relevant information about the implications and contributions that their work may have in relation to the cultural and creative industries sector. This review has focused mainly on official reports and documents of the European Commission, given the lack of homogeneity among the member states of the European Commission. In particular, Council Decision (EU) 2020/1512 of 13 October 2020 on guidelines for the employment policies of the Member States, the New European Agenda for Culture adopted by the European Commission in May 2018, the EU Gender Equality Strategy 2020-25 adopted on 5 May 2020, among others.

Finally, feedback on the development of the modules has been requested from partners in order to generate recommendations in line with the SCENE project. Through **bilateral meetings with the partners responsible for the modules and technological components**, that served on one hand, to contextualize the New European Bauhaus initiative in the framework of task 5.4, and on the other hand, to detect those aspects directly related to the social sciences and humanities.



3 Fair working conditions & CCI sector

This section provides the definition of fair working conditions according to the European Commission's normative framework². After establishing the general concept and how it applies to all labor sectors, the characteristics of the cultural and creative industries sector, to which the film industry belongs, are analyzed, especially those of the users related to the SCENE project. Finally, taking into account the sector and the end-users of the project, the aspects and challenges faced by the CCIs sector in relation to fair working conditions are detailed.

3.1 Fair working conditions framework and definition

The Universal Declaration of Human Rights of the United Nations (UDHR) establishes, for the first time, the fundamental human rights to be protected throughout the world³. Article 22 states that everyone, as a member of society, is entitled to social security and to the economic, social and cultural rights indispensable for his dignity and the free development of his personality.

In its turn, article 23 of the UDHR states that “everyone has the right to work, to free choice of employment, to just and favorable conditions of work and to protection against unemployment”. Therefore, the worker has the right to equal pay for equal work, without discrimination of any kind. That is to say, to just and favourable remuneration ensuring for himself and his family an existence worthy of human dignity, supplemented, where appropriate, by other means of social protection.

Article 27 of the UDHR establishes, on the one hand, that everyone has the right to participate freely in the cultural life of the community, to enjoy the arts and to share in scientific progress and its benefits. On the other hand, likewise, the worker has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.

In the complex context of European Union (EU) labor law, EU principles define in detail and establish a general regulatory framework for labor relations in its Member States. Article 31 of the EU Charter of Fundamental Rights (CFR)⁴ establishes the right of all workers to working conditions that respect their health, safety and dignity, as well as the limitation of maximum working hours, daily and weekly rest periods and paid vacations. Article 27 of the CFR guarantees the right of workers to information and consultation, while Article 28 of the CFR recognizes the right of workers and employers, or their organizations, to negotiate collective agreements, according to the European Union law as well as national laws. In addition, Article 23 of the CFR affirms the right to equality between women and men, including occupation, work and wages.

² The *European legal framework* refers to EU laws and regulations that promote fair working conditions, including directives on transparent employment terms, working time limits, and anti-discrimination, as well as foundational documents like the Charter of Fundamental Rights and the European Pillar of Social Rights. Access via: <https://eur-lex.europa.eu/>

³ United Nations. (1948). Universal declaration of human rights. <https://www.un.org/en/about-us/universal-declaration-of-human-rights>

⁴ European Parliament, Council of the European Union. (2012). *Charter of Fundamental Rights of the European Union*. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A12012P%2FTXT>





The European Social Charter⁵ recognizes that all workers have the right to fair working conditions and adequate compensation to ensure a decent standard of living for themselves and their families. It also emphasizes the importance of collective bargaining agreements and minimum wage setting mechanisms in guaranteeing these rights.

More recently, the European Pillar of Social Rights⁶, declared in 2017, reaffirms these principles. Principle 6 stresses that wages must be fair and adequate to ensure a decent standard of living for workers and those of the European Pillar of Social Rights families. It also stresses the need to avoid working poverty and to establish wages in a transparent manner. Furthermore, Principle 8 of the European Pillar of Social Rights underlines the importance of consulting the social partners in the formulation of labor and social policies, encouraging collective bargaining.

In this context, Council Decision (EU) 2020/1512⁷ urges Member States to ensure effective participation of the social partners in setting fair minimum wages, focusing on low- and medium-income groups. It is recommended that wages should be adequate and fair in order to improve the living and working conditions of all workers, thus contributing to sustainable and inclusive growth across the EU. Furthermore, the European Commission's 2019⁸ and 2020⁹ communications on Sustainable Growth insist on the need to ensure fair wages in response to growing social inequalities. With specific recommendations for Member States, they seek to improve the setting and updating of minimum wages, promoting upward convergence in the European labor market¹⁰.

In this sense, when we describe fair working conditions, we are referring to an environment where workers, whatever their field of employment, are treated with dignity, receive an adequate salary, work in safe conditions, have reasonable working hours, access to social security and are free from discrimination. Cultural and Creative Industries As all sectors, the cultural and creative industries are not excluded from all these basic conditions and principles that the international law and the European Commission has established according to the fair working conditions and that have been described in the previous section 2.1.

The cultural and creative sectors cover all sectors whose activities are based on cultural values or artistic expressions and other creative expressions, individual or collective, and are defined in the legal basis of the

⁵ Council of Europe. (1996). European Social Charter (revised). <https://www.coe.int/en/web/european-social-charter>

⁶ European Commission. (2017). *European Pillar of Social Rights*.

https://ec.europa.eu/info/strategy/priorities-2019-2024/economy-works-people/jobs-growth-and-investment/european-pillar-social-rights_en

⁷ Council of the European Union. (2020). Council Decision (EU) 2020/1512 of 13 October 2020 on guidelines for the employment policies of the Member States.

<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020D1512>

⁸ European Commission. (2019). Annual Sustainable Growth Strategy 2020.

https://ec.europa.eu/info/publications/annual-sustainable-growth-strategy-2020_en

⁹ European Commission. (2020). Annual Sustainable Growth Strategy 2021.

https://ec.europa.eu/info/publications/annual-sustainable-growth-strategy-2021_en

¹⁰ European Parliament, & Council of the European Union. (2022). Directive (EU) 2022/2041 of the European Parliament and of the Council of 19 October 2022 on adequate minimum wages in the European Union. Official Journal of the European Union, L 275, 33–47.





Creative Europe program. The European Commission establishes, according to article 2 of the European regulation establishing the Creative Europe Program¹¹, that “these activities include the development, creation, production, dissemination and conservation of goods and services embodying cultural, artistic or other creative expressions, as well as other related tasks, such as education or management”. On the other hand, the Commission includes as part of the cultural and creative sectors, “among others, architecture, archives, libraries and museums, artistic craftsmanship, audiovisual products (including cinema, television, and other creative activities as, video games and multimedia), tangible and intangible cultural heritage, design (including fashion design), festivals, music, literature, performing arts, books and publishing, radio and visual arts”¹².

This sector, as defined by the European Commission, is not homogeneous: it encompasses various disciplines and subsectors, such as performing arts, visual arts, design, media, audiovisual, among others, which operate according to different business logics and with different levels of public recognition and support. In fact, and even though it is out of the scope of the SCENE project, it is important to note that different definitions of artists and cultural workers coexist in Europe, a fact that hinders possible harmonization.

With regard to their legal form and organizational capacity, the cultural and creative industries are mainly made up of micro, small and medium-sized organizations and companies, as well as self-employed artists, cultural workers, independent and specialized professionals and entrepreneurs, who often work part-time and, in most cases, depend on irregular and mixed income from different sources¹³. Finally, in this sector self-employment rates are higher (33%) than in employment in the economy in general (14%) as highlighted by the Committee on Culture and Education in the Report on the situation of artists and the cultural recovery in the EU¹⁴.

The lack of homogeneity and the specific characteristics of the sector itself have an impact on issues related to the working conditions of cultural and creative workers, which are numerous and complex. Legal status, social security, the nature of income, taxation, intellectual property rights, collective bargaining, mobility, access to financing, freedom of expression, diversity and equality, as well as access to training and education are some of the aspects that vary depending on the different subsectors and to varying degrees. As a result, CCI workers often work under unstable and sometimes even precarious conditions. In fact, while several Member States have specific legislation that provides a special status for artists to guarantee them access to social benefits, this legislation varies considerably among Member States, a fact that hinders the mutual recognition of the status of artists and cultural and creative workers, and cross-border collaboration and mobility, thus creating barriers to cultural and artistic creation and expression, and to free movement, and ultimately to European cultural diversity and social sustainability.

¹¹ Regulation (EU) 2021/818 of the European Parliament and of the Council of 20 May 2021 establishing the Creative Europe Programme (2021 to 2027) and repealing Regulation (EU) No 1295/2013.

<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0818>.

¹² European Commission. (2018). Proposal for a regulation of the European Parliament and of the Council establishing the Creative Europe programme (2021 to 2027) (COM/2018/366 final).

<https://eur-lex.europa.eu/legal-content/ES/TXT/?uri=COM%3A2018%3A366%3AFIN>

¹³ European Parliament. (2021). *Report on the situation of artists and the cultural recovery in the EU (2020/2261(INI))*.

https://www.europarl.europa.eu/doceo/document/A-9-2021-0283_EN.html

¹⁴ European Parliament. (2021). *Report on the situation of artists and the cultural recovery in the EU (2020/2261(INI))*.

https://www.europarl.europa.eu/doceo/document/A-9-2021-0283_EN.html





Financial support for CCIs also varies widely among member states, both in terms of the size of budgets and the priorities and values that guide them, a fact that contributes to an even greater divergence in the sustainability of cultural workers' careers between countries and hinders the inclusiveness, sustainability and balance of cross-border collaboration and mobility.

Despite these difficulties and particularities, the cultural and creative sectors (CCS) play a fundamental role in shaping democratic, cohesive and reflective societies. Artistic, cultural and creative activities are essential for individual well-being and empowerment; they create a plural space for debate, drive social innovation and help us understand the complex and fast-paced realities in which we live. Culture is the basis of Europe's diversity and shared identity, as well as an essential component of the EU's economic dimension.

In recent years, these multiple values of the CCS have been increasingly recognized at the EU level. The European Agenda for Culture (2018)¹⁵ highlights the vital contribution of these sectors in various fields such as social life, economic development and international relations. However, this growing recognition of culture and the cultural and creative sectors is at odds with the lack of a coordinated and comprehensive approach at the European level to improve the working conditions of the individuals who “do culture” - artists, authors, performers, actors, cultural managers, and many other professionals in these sectors.

The vitality of European culture depends on the well-being, freedom and professional growth of people professionally dedicated to culture and the arts. Economic, social and cultural roles cannot be fulfilled without guaranteeing a fundamental living condition: a free and fair environment that allows creative people to develop their ideas and aspirations. This includes sufficient public recognition (legal, social, political) and adequate protection, as well as freedom from different types of pressures (economic, political, etc.). It is also necessary to create a broad space for cross-border exchanges, continuous learning, research and innovation.

In fact, the United Nations Educational, Scientific and Cultural Organization (UNESCO) has pointed out that artists “work primarily on a contractual, freelance and intermittent basis and their income continues to decline, fluctuate and remain uncertain”. The result is lower tax contributions, leading to lower access to social security, pensions and other welfare provisions. Indeed, the largest subsidy for the arts comes not from governments, patrons or the private sector, but from artists themselves in the form of unpaid or underpaid labor. This requires new thinking to revise labor and social protection frameworks that take into account the unique and atypical manner in which artists work, especially female artists¹⁶.

¹⁵ European Commission. (2018). Proposal for a regulation of the European Parliament and of the Council establishing the InvestEU Programme (COM/2018/267 final).

<https://eur-lex.europa.eu/legal-content/ES/TXT/?uri=COM%3A2018%3A267%3AFIN>

¹⁶ UNESCO. (2019). Culture & working conditions for artists: implementing the 1980 Recommendation concerning the Status of the Artist. UNESCO.



3.2 Filmmaking industry & SCENE end-users

3.2.1 Filmmaking industry

The media sector as a whole covers a variety of businesses that produce and distribute content, that share synergies, and whose value is based on intellectual property. The sector is largely composed by SMEs, although some bigger media companies have enough scale to incorporate media activities across sectors and along the value chain¹⁷.

In its turn, the audiovisual industry is made up of a large number of independent, highly innovative and creative companies, which cover all phases of content creation: pre-production, production and distribution. These companies are composed of different professionals including art directors, scriptwriters and technicians, among others.

In the last decade, the sector has undergone rapid and profound changes. It is directly affected by the digital transition and was severely hit by the COVID-19 pandemic, especially cinema. Distribution channels which emerged in the 2010s, such as video on demand (VoD), have had a structuring impact on consumption patterns and market dynamics. Altogether, the way content is financed, distributed and consumed has profoundly changed over the past few years.

After the impact of the pandemic and as mentioned in the European Media Industry Outlook Report¹⁸, the EU audiovisual industry is gradually recovering, leaving behind a 5.5% drop from 2019 to 2020, revenues to the EU market will increase by more than 8% the following year, reaching 91.4 billion euros in 2021. However, there are marked differences between the various subsectors. While VoD is growing rapidly and television remains resilient, cinema was the most affected by COVID-19 and physical video is disappearing. In this sense, the changes in the sector have been quite common in recent years, requiring a high flexibility from the sector.

The EU audiovisual sector employs approximately 490,000 people¹⁹. Production employment accounts for the largest share, with 42% of audiovisual employment in 2019. Broadcasters represent 34% (including information services as well as infrastructure/technical work), cinemas 13%, post-production 7% and distribution 3%. The main trend is the dramatic increase in production employment, which reflects the increase in production in the EU since the rise of streaming platforms.

In a sector, which includes a wide range of professions and a great dynamism in the changes and trends in the sector, as mentioned above, working conditions are also a reflection and vary significantly, with self-employed workers and short-term contracts being the most common practice in the sector. This generates economic vulnerability and lack of job security for workers. The value of this work is based on intellectual property and consequently on copyright, which is crucial in cinema, since films are creative products that need protection. However, negotiations on authors' rights are often not favorable to creators, often with contractual agreements that limit their rights to remuneration for the exploitation of their works.

¹⁷ European Commission. (2020). *Sustainable and smart mobility strategy – putting European transport on track for the future* (COM(2020) 784 final). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0784>

¹⁸ European Commission. (2023). *European Media Industry Outlook*. European Commission. https://ec.europa.eu/commission/presscorner/detail/en/ip_23_2814

¹⁹ Creative Europe Desk Ireland. (2023). *European media industry outlook report 2023*. <https://www.creativeeuropeireland.eu/content/images/European-Media-Industry-Outlook-Report-2023.pdf>



In fact, SCENE project already includes IP dimension as a strategic element, by including the Blockchain for IPR protection module as a horizontal one that will interact with all the services of the architecture that produce content like the MAM, 3D modeling, simulations, and any further component that generates multimedia. Its aim is to offer licensing control with smart contracts and will enable the auditability of the licensing for the multimedia content that is used in the process of filmmaking.

Funding is one of the biggest challenges for filmmakers, especially for independent productions. Financing models are often complicated and based on public grants, private investors and co-producers, a fact that can have a negative impact on the level of creative freedom of filmmakers. Given the current context, it is evident that the European film industry has to face technological innovations and changes in consumer preferences. The emergence of streaming platforms and digital consumption have forced the film industry to adapt quickly, with changes in its distribution and promotion strategies. In this context, the impact of Artificial Intelligence (AI) is also relevant, which has affected many sectors and professions (see *section 5. Impact of generative AI implementation on Working conditions*).

3.2.2 SCENE end-users

The SCENE project is an initiative aimed primarily at the cultural and creative industries sector, specifically at professionals in the film production and creation subsector. As highlighted in *D.2.2 End-users Needs & Requirements. R1 and R2*, the main users of the SCENE platform that have been identified according to its design, conceptualization and modules are i) *Location scouters*; ii) *Art Director*; iii) *Editor*; iv) *Director*; v) *Director of Photography*; iv) *Audio engineer*; v) *Producer*; and vi) *Distributor*.

i) Location scouters

Location scouters are responsible for finding and managing the locations where a film will be shot. They work closely with the director and production manager to ensure the locations fit the creative vision of the project. Location scouting is one of the main stages of the pre-production phase, which can have a considerable impact on both production and post-production phases. Evaluating the choice of shooting location is a crucial decision made by the production designer after reading the script. The fundamental tasks of that role are as follows²⁰:

- **Finding suitable locations:** Explore various potential locations and present options to the manager to evaluate each location based on various factors such as market potential, visual identity, visual requirements, accessibility, cost, competition, infrastructure and regulatory requirements. This stage helps to understand the feasibility and viability of each location.
- **Logistics management and coordination:** Coordinate permits, access and logistical needs for filming at each location.
- **Problem solving and documentation:** Deal with any obstacle that may arise during the shoot in external locations, such as unfavorable weather conditions or problems with authorizations.

There is no specific training for this role, although studying fields such as film production, real estate, urban planning, geography or history can provide useful background knowledge. It is also important to develop skills such as research in different disciplines, negotiation, problem solving and attention to detail.

ii) Art Director

²⁰ D.2.2 End-users Needs & Requirements R1 and R2



Art directors are responsible for set design, supervising artists and construction workers, selecting appropriate materials, and designing the overall look and feel of a film production. This involves working closely with the director to align set design with the story vision and emotional tone, ensuring that the aesthetics serve the narrative. Their tasks include creating concept art and detailed sketches, managing budgets and deadlines, overseeing the construction process, and coordinating with other departments, such as lighting, wardrobe and props, to maintain visual continuity throughout the scenes:

- **Research, design and creation:** Designing the aesthetics of the scenery, including colors, materials and furniture. This involves understanding the storyline, themes, period, atmosphere and specific requirements of each scene or setting. They conduct research on historical periods, architectural styles, cultural references and other relevant elements that will inform the design.
- **Construction and decoration:** from initial sketches or digital renderings to visualize the sets, they supervise the construction and decoration of the sets, as well as working with the art team to ensure that everything is ready for shooting. They collaborate with a team of craftsmen, carpenters, painters and other artisans to build and create the sets. They ensure that construction adheres to safety standards, timeliness and artistic vision.
- **Maintenance:** Makes adjustments to the sets during the shoot according to the needs of the director or cinematographer.
- **Documentation and Evaluation:** Finally, set designers document the entire process for future reference and evaluation. They analyse what worked well and what could be improved for future projects.

Although there are specific and regulated training courses for set designers, technological advances are re-defining the future of this role, playing an important role in shaping the aesthetics, practicalities and creative possibilities of set design. An example is the use of virtual reality (VR) and augmented reality (AR) in pre-visualisation, which allow space designs to be approached pre-construction and very much like reality.

iii) Editor

The editor is a technical-artistic profile dedicated to assembling (cutting) the images (rushes) as they arrive from the set. Since films are not usually shot in the order in which the story unfolds, editors may work on scenes from the end of the film before the beginning. Their job is to take scenes that do not follow the order of the story and edit them bit by bit to form a whole.

In the pre-production phase, editors work closely with the director to decide how to get the most out of the script. Once shooting begins, they review the rushes each day, check technical standards and the emerging sense of story and performance, and edit it into a series of scenes.

During post-production, the editor and director will work closely together to refine the rough cut into a director's cut, which must be approved by the producers, until picture lock is achieved (known as final cut). Music and sound are then added, a process overseen by the editors.

- **Media access and assembling Footages:** Editors mainly focus on organizing scenes to properly follow the film's narrative flow and rhythm. It is really important to maintain a structure of coherent transitions to maintain visual continuity across scenes. It also includes the proper integration between the audio and video contents, in close collaboration with the Audio Engineers, and the correct use of Metadata, to ensure the continuity and consistency of the process and content.
- **Technical Quality Control:** Editors monitor technical standards, including image quality, sound synchronization, and color consistency, ensuring that each scene aligns with production requirements and cinematic standards.



- **Collaboration with the Creative Teams (directors and producer):** Working closely with the director, sound designers, and sometimes even cinematographers, editors provide feedback on scene performance, lighting, and angles to maximize the film's visual and emotional impact.
- **Refinement and Polishing:** Editors refine each sequence to create the director's cut, this process involves fine-tuning the timing, rhythm, and transitions until the film fully aligns with the director's vision.

It is clear that technological advances are deeply impacting in the segment, as there are many opportunities to improve their efficiency in the “routine” works, such as tagging, quality control, content share and review, that can be improved through the use of new technologies.

iv) Directors

The director is responsible for the artistic and creative vision of the film. Their work is fundamental, as they lead and guide the work and make key decisions that affect all aspects of the project. Their duties include:

- **Interpretation and script development:** Analyzing the script and determining how it will be translated to the screen.
- **Selecting the cast and directing actors:** the director participates in directing the actors and working with them to obtain the performances that best reflect his artistic approach.
- **Collaboration with the crew:** Coordinate with the director of photography, the editor and other crew members to ensure that the film develops as planned.

As with the set designer, there are specific and regulated training courses and even a degree for this role as well. Even so, the role requires multiple skills that blend technical expertise with a profound artistic and creative vision, it requires a diverse set of skills often honed through years of practical experience. Through a transdisciplinary and interdisciplinary approach, the director participates in all phases of the film creation, requiring knowledge that spans a wide range of fields—cinematography, storytelling, sound design, editing, and acting, among others.

v) Director of Photography

The Director of photography is responsible for the look and feel of a film in close collaboration with the director. They research how to create that look through lighting, framing and camera movement, and what they will need in terms of equipment and crew to achieve it.

- **Visual style development and planning:** The Director of photography collaborates closely with the director to define the film's visual style, determining the look and feel that aligns with the narrative.
- **Lighting design and execution:** They are responsible for designing the lighting setup for each scene to evoke the desired atmosphere and highlight specific details. The Director of Photography carefully chooses light sources, positioning, intensity, and color to create depth, focus, and emotional tone implying a strong collaboration with the Lighting experts and other Directors.
- **Framing and Composition:** The Director of Photography decides on shot composition, framing, and aspect ratio for each scene. This includes planning shot sizes, camera angles, and positioning to visually tell the story and support character focus or scene dynamics.
- **Camera Movement and Techniques:** The Director of Photography chooses the camera movements—whether static, handheld, or with cranes and dollies—that enhance the scene's energy and perspective. They plan how and when to use techniques such as tracking, panning, or zooming for impact.



- **Equipment and crew coordination and management:** They determine the necessary cameras, lenses, lighting, and other technical equipment for achieving the visual style. The Director of Photography coordinates with the camera and lighting crew, ensuring that they work seamlessly to achieve each shot.

The photography director begins their careers with some type of formal training such as film school or photography school. They are a professional who has eminently technical knowledge related to the use of technological equipment such as cameras and lighting equipment, as well as knowledge of editing, as well as other skills such as communication and planning.

vi) Audio Engineer

Audio engineers are professionals in charge of recording, synchronizing, mixing and reproducing sound effects, music and vocals. Their work encompasses a variety of technical and creative tasks, the ultimate goal of which is to produce a high-quality recording that meets the needs and expectations of the project. The audio engineer works in close collaboration with the director and sound designer to understand the auditory vision of the project, ensuring the sound complements the story.

- **Sound Recording and Capture:** The audio engineer is responsible for setting up and operating equipment to record high-quality sound during production. This includes microphones, mixing boards, and recording devices, ensuring all sound sources are captured with clarity and precision.
- **Sound Design and Mixing:** They design and mix sound elements for a film, television show, or other media. This involves blending dialogue, sound effects, and music into a coherent soundtrack that enhances the visual experience, ensuring balance and clarity across all audio elements.
- **Technical Setup and Equipment Management:** Audio engineers ensure that the recording and playback systems are set up and functioning correctly. They select and maintain the appropriate microphones, speakers, and sound devices to match the acoustic needs of the production.
- **Audio Processing and Editing:** After capturing sound, the audio engineer is responsible for processing and editing the audio to remove unwanted noise, adjust levels, and fine-tune the quality. This includes equalizing sound, adding effects, and synchronizing audio with visuals during post-production.
- **Live Sound Management:** In productions involving live sound, the audio engineer is responsible for mixing and managing sound levels in real-time, ensuring clear, consistent audio for audiences during performances or events.
- **Final Audio Mastering:** In post-production, the audio engineer finalizes the sound by mastering the tracks, optimizing sound quality across various formats and ensuring it meets technical standards for broadcast or distribution.

There are many technologies impacting the sector and will require their continuous learning process in the overall audio management tool, including from the new technologies for artificial audio creation to the synchronization and management of audio information.

vii) Producers

Producers are responsible for the overall management of the project, including its financial, logistical and creative aspects. Their role is essential to ensure that the film is made successfully and according to the budget. Their tasks include:

- **Financing:** Raising funds for the project, which may include investors, grants or loans.



- **Planning and logistics:** Coordinate production and ensure that shooting dates, locations and budget are respected.
- **Team Management:** Supervise the entire production team and collaborate with the director and other professionals to maintain the creative vision.
- **Creative Decision Making:** Producers often have creative input, offering feedback on scripts, casting choices, editing, and overall storytelling. They work closely with the director to maintain the vision of the film.
- **Marketing and Distribution:** Producers are involved in marketing strategies and decisions about how the film will be distributed and promoted to reach its audience effectively.
- **Legal and Administrative Tasks:** They handle legal issues, contracts, permits, insurance, and other administrative tasks necessary for the production.

There are many types of producers (e.g., executive producer, line producer, assistant producer, associate producer, among others), and it is an ill-defined role within the film industry that can vary from production to production. In most cases, they are professionals who have worked in very different positions within the same industry, other producers come from a finance or business background, and in any case, it involves a combination of different skills such as marketing, fundraising, budgeting, among others as well as creative vision.

viii) Distributors

Distribution executives are responsible for getting films to screens or streaming platforms. In the film industry, they attend film markets to acquire films from production companies or sales agents, negotiating rights for distribution. This includes agreements on promotion, classification and possible editions. They then present the films to exhibitors and platforms and coordinate the release, including marketing strategies to maximize profits.

- **Rights acquisition:** Negotiate and acquire rights to distribute films or dramas in cinemas, on TV or digital platforms.
- **Assistance to film and TV markets and fairs:** Evaluate films and series, ensuring acquisitions meet the company's objectives.
- **Release planning:** Coordinate the launch and distribution of content, determining release dates and distribution strategies.
- **Marketing and promotion:** Develop and oversee promotional campaigns, focused on attracting target audiences and maximising financial returns.
- **Negotiation with exhibitors and platforms:** They present films and series to cinema exhibitors or streaming platforms, managing exhibition and transmission agreements.
- **Merchandising and publishing rights management:** They oversee potential product extensions, such as merchandise or related publications.

Distribution professionals often begin their careers in business or marketing. Whether their background lies mostly in the production or business side of the industry, they have to understand the roles involved in the overall filmmaking process.

The main users of the SCENE platform described above i) Location Managers; ii) Art Directors; iii) Editors; iv) Directors; v) Directors of Photography, vi) Audio Engineers vii) Producers and viii) Distributors, within the audiovisual and creative industries, are typically linked to project-based work. This form of employment is characterized by the self-employment or contracts that are temporary and tied to specific productions with



a defined beginning and end. Such roles often lack the stability and security of long-term or permanent positions, which is a core issue regarding fair working conditions in the cultural and creative industries sector. In project-based work, workers face challenges such as inconsistent income, short and tight deadlines, fluctuating schedules, and limited access to social protections, including unemployment benefits or health insurance, as the roles are often classified as freelance or temporary.

These professions are closely linked to technological advances, offering a wide range of creative possibilities but an uncertain future. This forces them on the one hand to adapt constantly, accessing training or the help of new professionals who were not initially linked to the industry, and on the other hand to rethink their roles in the sector (see section 5. Impact of Generative AI implementation on working conditions).

3.3 Importance of Fair Working Conditions in the CCI sector

The European Commission states that the cultural and creative industries sectors (CCIS) play a fundamental role in human flourishing and in promoting Europe's social and economic cohesion, vibrant democracy and the prosperity and inclusiveness of our societies. This requires supporting the sector so that they can carry out their work with all the guarantees, possibilities and capabilities. As the Commission reminds²¹, many artists and cultural professionals have a secondary job in either an art- or non-arts-related field, motivated both by artistic interests and above all by financial needs. In fact, this precariousness leads many of them to leave the sector, especially migrant artists and cultural professionals or those with a difficult socio-economic background. One of the biggest challenges for these artists is to ensure that there is enough time to dedicate to their artistic and/or creative occupation. This makes it difficult to reconcile family life with their work experience and career, as these professionals often deal with complicated schedules and working hours, unstable and changing working conditions, and insecure incomes (or lack of them). Complex situations that have a direct impact on the work of these professionals and that in many cases are not in line with the fair working conditions referred to by the European Commission (see section 3.1. *Fair working conditions framework and definition*).

In view of these usual situations in the sector, ensuring fair working conditions in the cultural and creative industries (CCIs) is essential not only for the well-being of individual artists and cultural professionals, but also for the sustainability and vitality of the sector as a whole. Fair working conditions include several key factors: secure employment, adequate wages, social protections such as health insurance and pensions, and access to professional development opportunities. Without these guarantees, many CCI professionals face increased financial instability, which can hinder their creative output and innovation.

In addition, the COVID-19 pandemic has highlighted and intensified vulnerabilities within the CCI sector. As containment measures were imposed, productions being canceled, locations becoming inaccessible or travel impossible, and also cinemas were closed, resulting in a drastic drop in income for many creative professionals. The lack of a consistent and predictable income has led to an increased reliance on temporary or part-time jobs outside the creative field, which in turn reduces the time spent on artistic activities.

The precarious nature of employment in the CCIs disproportionately affects vulnerable groups, including women, young professionals and artists from diverse ethnic backgrounds, who often face additional barriers such as unequal pay, limited access to social security and fewer opportunities for career advancement. These

²¹ European Parliament. (2021). *Report on the situation of artists and the cultural recovery in the EU (2020/2261(INI))*. https://www.europarl.europa.eu/doceo/document/A-9-2021-0283_EN.html



inequities can exacerbate social disparities and contribute to the loss of cultural diversity, which is one of the pillars of the European Union's commitment to inclusiveness and equality.

Fair working conditions would help artists and cultural workers maintain their creative occupations without the constant pressure of financial insecurity. These conditions would also support cross-border mobility, allowing professionals to engage in cultural exchanges and collaborations across Europe. With a more stable environment, artists and cultural professionals could focus on their creative work, which is vital to Europe's cultural diversity, innovation and social progress.

4 Aspects & recommendations of fair working conditions regarding the CCI sector

This section focuses on detailing the key aspects that need to be observed to ensure fair working conditions, detailing recommendations to the challenges faced by the cultural and creative industries sector, in particular the target groups of the SCENE project.

4.1 Key aspects related to the fair working conditions

In this section the key aspects related to the fair working conditions of the sector are provided, that is, these aspects that directly affect the life quality and well-being of the cultural and creative workers. This includes aspects such as job security, which refers to contract stability and predictability of income; fair wages, which allow for a dignified life and reflect the value of the work performed; work-life balance, which ensures reasonable and flexible working hours; access to social benefits such as health and unemployment protection. In addition, non-discrimination and gender equality in the workplace are fundamental principles for ensuring fair working conditions. All these factors are essential to ensure that professionals in the sector can develop their creative activities in a respectful, equitable and dignified environment. Finally, the definitions reported in this section are based on the resolution of the European Parliament of *21 November 2023* in which recommendations to the Commission on an EU framework for the social and professional situation of artists and workers in the cultural and creative sectors were provided²².

4.1.1 Fair wages

The wage constitutes a fundamental element in the employment contract, determining not only the employment relationship itself, but also its adequacy to satisfy the personal and family needs of the workers. In addition to being a remuneration for the labor activity, the salary is an inherent right to the concept of decent and fair work. This is set out in the Universal Declaration of Human Rights (Article 23), the International Covenant on Economic, Social and Cultural Rights, the United Nations Sustainable Development Goals (Objective 8) and the European Social Charter (Article 4), among others.

Labor law, aimed at balancing the relationship between employers and workers by setting minimum standards, establishes minimum wage limits. This translates into the guarantee of a minimum remuneration, below

²² European Parliament. (2023). EU framework for the social and professional situation of artists and workers in the cultural and creative sectors: European Parliament resolution of 21 November 2023 with recommendations to the Commission on an EU framework for the social and professional situation of artists and workers in the cultural and creative sectors (2023/2051(INL)). <https://www.europarl.europa.eu>



which the hiring of workers is not allowed. This protection is a requirement of both international law and many national laws, as it is key to ensuring decent living conditions.

Although European institutions do not have full competencies in this area, they have promoted the implementation of mechanisms to ensure fair and adequate wages. This responds to the objective of guaranteeing working conditions that contribute to the well-being of workers and their families, within the framework of decent work and beyond the strict logic of the employment contract itself. In fact, all EU states already have legal systems or at least conventional - often sectoral - tools for minimum wage setting.

Fair wages should reflect the worker's character, knowledge, skills, background, effort and hours worked, and be in line with the cost of living. The phenomena of globalization and digitalization have led to a concentration or polarization of quality jobs and, consequently, to the emergence and proliferation of low-skilled occupations and even unconventional forms of work, all of which are poorly paid.

The cultural and creative industries (CCIs), as the European Commission points out, are renowned for their low wages, with 38% of professionals in this sector being in the three lowest wage deciles according to the Eurofound Labour Force Survey²³. It is essential that cultural work is considered a professional activity and, as such, should be fairly remunerated, reflecting the level of education, skills and experience of the workers. However, practices such as unpaid work, unpaid internships, jobs non-associated to the amount of effort and hours and compensation in the form of exposure remain common in the sector, exacerbating power imbalances between employers and workers. This often impels artists to work below market value (and potentially below minimum wages) in order to secure a contract.

Another major concern is the practice of late payments, which affects the solvency of both the self-employed and small and medium-sized enterprises (SMEs), widening socio-economic inequalities among professionals. In addition, there is an urgent need to implement European directives to ensure fair and timely payment.

The use of 'buy-out' contracts, which transfer exploitation rights in exchange for a one-off payment, has also been highlighted as an abusive practice that makes creators more precarious, exacerbating imbalances between the contracting parties.

Finally, the importance of public funding and the role of public funders in promoting fair practices is underlined. It is considered that all professional institutional engagements in CCIs should be adequately remunerated, and authorities are called upon to introduce social clauses in public funds to ensure fair working conditions throughout the subcontracting chain.

The European Parliament and Council of the European Union recently issued Directive (EU) 2022/2041²⁴ which represents a significant change in EU wage policy, demonstrating a renewed focus on minimum wage protection in the face of growing in-work poverty. In contrast to the previous approach, which strictly linked wages to business competitiveness, the directive introduces mechanisms to guarantee a minimum wage. It establishes the need to set adequate minimum wages and assigns to the States the responsibility for their

²³ Eurofound (2024), Minimum wages for low-paid workers in collective agreements, Minimum wages in the EU series, Publications Office of the European Union, Luxembourg.

²⁴ European Parliament & Council of the European Union. (2022). Directive (EU) 2022/2041 of the European Parliament and of the Council of 19 October 2022 on adequate minimum wages in the European Union. <https://eur-lex.europa.eu/legal-content/ES/TXT/?uri=CELEX%3A32022L2041>



control, promoting collective bargaining beyond the company level. This is a significant step forward, as it represents the first time that the EU has addressed the issue of wages in a more direct manner.

The transposition of this directive in Member States, including those with strong wage-setting systems, could achieve at least two objectives. First, to improve minimum wages to reach international standards, such as 60% of median gross pay. Second, to encourage the adequacy of wages to ensure a decent standard of living, which could limit the use of wages as a tool for internal flexibility. Taken together, these measures suggest a shift towards greater protection of labor rights in the European context.

4.1.2 Social protection

Social protection, or social security, is a human right and can be defined as the set of policies and programs aimed at reducing and preventing poverty and vulnerability throughout life. Social protection includes the access to benefits such as health care, pensions, unemployment insurance, and paid leave. Social protection systems address all these policy areas through a combination of contributory schemes (social insurance) and non-contributory tax-financed benefits, including social assistance.

Workers in the cultural and creative sector face many difficulties in accessing social protection, in part linked to the nature of their contracts and the characteristics of their work.

In most countries, entitlement to social protection benefits from social security schemes is determined by the type of activity, the contractual relationship and the income from work. The characteristics of occupations in the cultural and creative sector, often lead to sporadic social security contributions, which can have a significant impact on workers' access to social protection benefits when a particular contingency (such as maternity, maternity leave, etc.) occurs. Such sporadic contributions may mean, for example, that workers in the cultural and creative sector may not contribute for the periods of time required to be eligible for social protection benefits, such as retirement pensions, due to low contribution densities (resulting from interrupted employment career). In addition, national social protection systems may not be sufficiently adapted to the realities of these workers, which also has an impact on their social protection coverage.

In Europe, due to the diversity of legal systems and regulations that vary among member states, there is a wide range of rights and protections that can differ significantly from one country to another. In some countries, contributory schemes cover formal workers with employment contracts; these schemes may be extended to the self-employed, but often affiliation is voluntary and the worker is responsible for both the employer's and the worker's share of contributions. In other countries, the self-employed may simply be excluded by law.

Indeed, persons working in the cultural and creative sector are usually considered to be economically independent contractors and are therefore not covered by labor law; they are not wage earners and may therefore not be covered by social insurance mechanisms. In some countries, workers in the cultural and creative sector may prefer to be self-employed; however, in certain countries and professions, they may have no other choice. As pointed out by the European Parliament, “experts have identified the lack of a definition of



CCS professionals and of recognition of the specificities of their working conditions as one of the main factors leading to the weak social protection coverage of CCS professionals”²⁵.

Contributing to social protection schemes when self-employed can be expensive, as the worker is responsible for the employer's share of contributions in addition to the worker's own, as explained above. This means that, although not excluded from social protection schemes by law, the self-employed may, in practice, choose not to participate if it is not compulsory.

The European Parliament in a recent resolution with recommendations to the Commission on an EU framework for the social and professional situation of artists and workers in the cultural and creative sectors²⁶ encourages EU Member States - who do not yet have one - to establish a specific status for artists and professionals in the cultural and creative sectors. The specific status is an instrument to facilitate their access to adequate social protection and complying with the minimum standards set by the Council Recommendation of 8 November 2019²⁷. States that already have an “artist status” are urged to monitor and improve their adequacy to ensure coverage for all CCS professionals, especially freelancers, adapting to the new challenges brought by digitalisation and the COVID-19 pandemic.

4.1.3 Employment security

Employment security means that workers have protection against arbitrary and short-notice dismissal from employment, as well as having long-term contracts of employment and having employment relations that avoid casualisation. Protection against arbitrary dismissal is a central aspect of employment security, ensuring that workers are not dismissed without just cause or proper procedure. This is achieved through laws that mandate employers to provide valid reasons for dismissal, mandatory prior notification periods, and mechanisms for challenging unfair dismissals. In addition, in many cases, severance pay is required, making it difficult for employers to arbitrarily dismiss workers without justification.

Another aspect that contributes to job security are certain types of contracts, such as long-term or permanent employment contracts. Permanent contracts provide workers with greater job stability and continuity. In many countries, there are restrictions on the use of temporary contracts for jobs of a continuous nature and, after a certain period, these contracts must become permanent. In any case, temporary or fixed-term contracts are the most common in the cultural and creative industries sector for labor relations, which makes it difficult for these professionals to reach job security.

As mentioned, most professionals in the Cultural and Creative Industries (CCI) work on temporary, project-based contracts or as freelancers, lacking job security—particularly within the film industry. Often, they are

²⁵ European Parliament. (2023). *EU framework for the social and professional situation of artists and workers in the cultural and creative sectors* (P9_TA(2023)0405). European Parliament resolution of 21 November 2023 with recommendations to the Commission on an EU framework for the social and professional situation of artists and workers in the cultural and creative sectors (2023/2051(INL)). <https://www.europarl.europa.eu>

²⁶ European Parliament. (2023). *EU framework for the social and professional situation of artists and workers in the cultural and creative sectors* (P9_TA(2023)0405). European Parliament resolution of 21 November 2023 with recommendations to the Commission on an EU framework for the social and professional situation of artists and workers in the cultural and creative sectors (2023/2051(INL)). <https://www.europarl.europa.eu>

²⁷ Council of the European Union. (2019). Council Recommendation of 8 November 2019 on access to social protection for workers and the self-employed (2019/C 387/01). Official Journal of the European Union. <https://eur-lex.europa.eu>





retained and paid only until a project's end, without assurance of re-hiring for future projects, making job security harder to guarantee than for regular employees. Additionally, the risk of "de facto dismissal" by not being selected for subsequent projects is a concern that impacts CCI workers more than regular employees.

Employment security also seeks to avoid the "casualization" of work, that is, the transformation of stable jobs into more precarious forms of work. This involves limiting the use of casual, hourly or non-guaranteed hourly contracts, and ensuring that part-time or temporary workers receive similar protections and benefits as permanent full-time employees.

4.1.4 Collective bargaining

Collective bargaining refers to the right of workers to negotiate collectively for better terms of employment and working conditions, a principle supported by the European Union. As all workers, also professionals in the cultural and creative sectors, including freelancers and self-employed workers, have the right to form and join trade unions and professional organizations in order to participate in the process of cultural, social and labor policy-making. Indeed, collective bargaining is a mechanism that promotes decent working conditions and fair wages. The importance of collective bargaining in ensuring adequate minimum wage protection and better working conditions is also highlighted.

The right to freedom of association and collective bargaining is guaranteed in several international treaties, given its link to workers' ability to obtain fair compensation and access to social protection. Yet, collective bargaining in the cultural and creative industries sector varies across EU Member States and is highly fragmented. The lack of collective bargaining practices in the cultural and creative industries sector contributes to low quality of work, insufficient income and limited social protection, generally focusing on employees rather than the self-employed. Globally, initiatives have been implemented to strengthen collective bargaining for atypical workers, including the extension of collective agreements to non-unionised workers. This is particularly relevant in sectors such as the performing arts, where many self-employed workers are not covered by collective agreements despite their long tradition of unionization. New forms of employment have segmented the labor market, generating precarious working conditions and low incomes, leading to a rapid decline in collective bargaining coverage and a shift towards more decentralized and individual bargaining processes.

4.1.5 Work-life balance

Work-life balance is a concept that refers to the equal and balanced participation of any people in both their family life and the labor market²⁸. This balance is crucial to ensure that workers can fulfill their family responsibilities without sacrificing their career and economic well-being. In recent years, this aspect has become more prominent in labor legislation, with the introduction of a number of measures designed to promote more equal participation in both spheres.

Among the main legislative measures related to work-life balance are parental leave, which offers equal leave opportunities for both progenitors, parental leave and the possibility of reduced working hours. These

²⁸ European Commission. (2017). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: An initiative to support work-life balance for working parents and carers (COM/2017/0252 final). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52017DC0252>



measures aim to alleviate the burden placed on people, especially women, by the need to reconcile paid work and family responsibilities.

Despite improvements in education and training, where women in the EU tend to achieve better educational outcomes than men, their participation in the labor market remains lower. This lower participation has a direct impact on their economic independence. One of the main causes of this labor gap is the unequal sharing of family responsibilities between men and women. In many families, the birth of children significantly increases the gender gap in employment, as women face greater difficulties in balancing child-rearing and family responsibilities with their work. Inadequate work-family reconciliation policies mainly affect women, who in many cases are under pressure to reduce their working hours or leave the labor market temporarily or permanently. This contributes to increasing gender inequality, not only in terms of labor participation, but also in terms of income and career development. At the same time, men are often disincentive or discouraged from taking family leave or making use of flexible working arrangements, which perpetuates traditional gender roles. In this regard, parental leave policy reforms are crucial, as they encourage greater involvement of men in childcare.

Several countries have introduced substantial reforms on parental leave, supporting, in most cases, a more active involvement of the second progenitor in childcare. Some of them are parental leave that provides equal leave opportunities for both parents, leave of absence from work and possibility of reduced working hours, among others²⁹. This work-life balance challenge is an issue particularly relevant in the Cultural and Creative Industries, where workers often face irregular and unpredictable working hours, work commitments during evenings and weekends, and unpaid overtime. In this sector, it is common for workers to rely on high mobility and job flexibility, making work-life balance even more difficult. Moreover, many workers in CCIs, especially the self-employed and those on project-based contracts, face additional challenges such as a lack of wage transparency and insufficient social support, which aggravate working conditions and make it difficult to balance their personal and professional lives.

Work-life balance measures in CCIs are often insufficient, leading to high gender inequality in the sector, as women are often disproportionately affected. The lack of effective mechanisms to facilitate the reconciliation of work and family responsibilities contributes to the fact that many women face barriers to professional development in these industries.

4.1.6 Equality and non-discrimination

Equality and nondiscrimination refer to the treatment of workers regardless of gender, race, nationality, or socio-economic background. This includes equal opportunities for pay, promotions, and access to jobs. Despite the gender gap being closed in education, it persists in employment, pay, care responsibilities, power and pensions. Too many people continue to contravene the principle of gender equality through sexist hate speech and by obstructing measures against gender-based violence and gender stereotypes. Gender-based violence and gender-based harassment remain at alarming levels³⁰.

²⁹ European Parliament & Council of the European Union. (2019). Directive (EU) 2019/1158 of the European Parliament and of the Council of 20 June 2019 on work-life balance for parents and carers and repealing Council Directive 2010/18/EU. Official Journal of the European Union, L 188, 79–93. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019L1158>

³⁰ European Commission. (2020). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Union of Equality: Gender Equality Strategy 2020-2025 (COM/2020/152 final). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0152>





Women are frequently victims of sexism, gender stereotyping and sexual harassment, and often earn less than men in equivalent positions. As stated by the European Commission, gender stereotypes are one of the root causes of inequality between men and women and affect all areas of society. Stereotypical expectations based on fixed norms for women and men, girls and boys limit their aspirations, choices and freedom and must be eliminated³¹. Gender stereotypes are a major contributor to the gender pay gap. They are often combined with other stereotypes, such as those based on racial or ethnic origin, religion or belief, disability, age or sexual orientation, and this can reinforce the negative effects of stereotypes.

The cultural and creative sectors, due to often precarious working conditions and unbalanced power structures, have a higher-than-average exposure to bullying and discrimination. The live entertainment and film/television production sub-sectors are particularly affected by this situation³². Nowadays, women are not actively denied the opportunity to be an artist or a cultural professional – although they still face systemic discrimination. Nevertheless, according to Eurostat’s cultural statistic edition 2019, women constitute the vast majority of students in all cultural fields³³.

4.2 Recommendations

This section focuses on detailing the recommendations to ensure fair working conditions, detailing indicators and possible solutions to the challenges faced by the cultural and creative industries sector, in particular the end-users of the SCENE project.

In relation to this sector, ensuring fair working conditions requires joint work and effort from policymakers, employers, and workers within the cultural and creative sectors.

On the employers and companies’ side, there are aspects such as the contract stability, the number of working hours, the health and safety compliance, among others that can be guaranteed by the employers and companies:

- **Contract stability:** employers should prioritize offering permanent contracts over temporary or freelance contracts, ensuring the access of these professionals. In the event that the professional's work is associated with a specific project, the reallocation should be promoted. This stability not only provides financial security for workers, but also gives them access to benefits such as healthcare, pensions and job security. By fostering long-term employment relationships, companies can help retain talent and create a more engaged workforce.
- **Working hours:** It is essential that employers set clear and reasonable working hours, following general standards. Applying rules to ensure that employees are not overworked will contribute to their

³¹ European Commission. (2020). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Union of Equality: Gender Equality Strategy 2020-2025 (COM/2020/152 final). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0152>

³² European Parliament. (2023). *EU framework for the social and professional situation of artists and workers in the cultural and creative sectors* (P9_TA(2023)0405). European Parliament resolution of 21 November 2023 with recommendations to the Commission on an EU framework for the social and professional situation of artists and workers in the cultural and creative sectors (2023/2051(INL)). <https://www.europarl.europa.eu>

³³ OMC Working Group of Member States’ Experts. (2021). *Towards gender equality in the cultural and creative sectors: Report of the OMC working group of Member States’ experts*. Publications Office of the European Union. <https://op.europa.eu/en/publication-detail/-/publication/2ef2c9d2-7b6d-11eb-9ac9-01aa75ed71a1>



overall well-being and productivity. In any case, overwork should be remunerated fairly and adequately. Flexible working hours can also help accommodate the unique demands of creative work, allowing professionals to devote themselves fully to their projects without compromising their personal lives.

- **Health and safety compliance:** Employers must comply with health and safety regulations to create a safe working environment for all employees. This includes providing necessary safety equipment, conducting regular risk assessments, and fostering a safety culture that encourages workers to express their concerns in this regard. In addition, the employer must at all times provide safety and health-related training to workers so that they are protected.
- **Work-life balance:** the employers should implement measures to balance between the professional and private life of artists and cultural professionals, allowing for an improvement in the living conditions of these professionals, thus contributing to a reduction of informality in the sector. This can include offering flexible working hours, remote work options, and sufficient paid leave.
- **New digital business models:** Also, is necessary to ensure an adequate remuneration of artists and creators in new digital business models. The pandemic has encouraged the use of digital media and further highlighted the need to move towards digital business models that can provide fair remuneration for artists and creators. Employers should develop fair pricing strategies for digital content that reflect the value of the creators' work. This includes establishing transparent revenue-sharing agreements and exploring innovative monetization methods that prioritize fair compensation for artists and creators.

Other challenges stated by the EU Parliament in 2023³⁴, are related directly with policymakers, such as the development and application of the artist's statute in the European level, among others:

- **The European artist's statute:** which will establish a framework for the working conditions and common and minimum standards common to all European Union countries, measures to ensure the sustainability of the careers of artists and cultural workers.
- **Diversity of policies:** as mentioned above, the heterogeneity of the sector makes it necessary to design and implement policies in the cultural field that take into account the diversity of sectors, industries and workers. In particular, their production models, business models, cost structures and legal form, but also the different origin, gender, age, social class, etc., of professionals, which determine, to a large extent, their training and professional curriculum.
- **Training programs:** It is necessary to support training programs and initiatives enabling professional development. These actions should facilitate access to lifelong learning and training, skills upgrading and retraining that support the transition from education to cultural and creative employment, as well as collaboration with other artists and international mobility.

Finally, it is necessary to work for the recognition of the individual, community and social value of art and culture, as well as their economic value. This effort will result in greater recognition of the status of those working in culture and the arts, facilitating safer creative environments.

³⁴ European Parliament. (2023). *EU framework for the social and professional situation of artists and workers in the cultural and creative sectors* (P9_TA(2023)0405). European Parliament resolution of 21 November 2023 with recommendations to the Commission on an EU framework for the social and professional situation of artists and workers in the cultural and creative sectors (2023/2051(INL)). <https://www.europarl.europa.eu>



5 Impact of Generative AI Implementation on Working Conditions

5.1 Introduction to Generative AI in the Filmmaking Industry

Generative Artificial Intelligence (GenAI) represents a significant advancement in the realm of artificial intelligence, characterized by its ability to create new content from existing data. Unlike traditional AI, which primarily focuses on data analysis and pattern recognition, generative AI can produce novel outputs, including images, text, audio, and even video. This capability has profound implications for various industries, particularly filmmaking, where creativity and innovation are paramount.

The filmmaking industry has always been at the forefront of adopting new technologies to enhance storytelling and production quality. From the very beginning and throughout its history, motion picture production has been inherently linked to technological advancements. A few decades ago, films were recorded on physical media using bulky cameras that often required several crew members to operate. Aerial shots necessitated heavy constructions mounted on helicopters. Editors meticulously cut, spliced, and threaded film to ensure seamless exhibition in cinemas. Even the smallest scratch could ruin all the effort and result in the loss of entire scenes. Animation was hand-drawn by artists on celluloid. Props and sets for visual effects were manually crafted, sometimes resulting in unrealistic viewing experiences due to the lower quality than technically possible at the time, shattering the illusion the movie is supposed to create for viewers. Moreover, the entire filmmaking process was time-consuming and the costs were considerable³⁵.

From the early days of special effects to the integration of digital animation and computer-generated imagery (CGI), filmmakers have continuously pushed the boundaries of what is possible. Generative AI is the latest in this line of technological innovations, offering new tools and methods to transform the creative process. The market size for generative AI in movies is projected to increase from USD 276 million in 2022 to approximately USD 2,882 million by 2032, with a compound annual growth rate (CAGR) of 27.2% over the period from 2023 to 2032³⁶. The media industry is expected to lead all sectors in AI investment growth, boasting a five-year compound annual growth rate of over 30%³⁷.

Generative AI can be used in multiple stages of filmmaking^{2,38,39}. Industry leaders can leverage AI tools to enhance the creative process and introduce new efficiencies in the production workflow from scriptwriting and pre-visualization to content localization and sound editing⁴⁰.

³⁵ "Understanding Media and Culture: An Introduction to Mass Communication", University of Minnesota, 2016.

³⁶ <https://marketresearch.biz/report/generative-ai-in-movies-market/>

³⁷ International Data Corp.'s (IDC), "Worldwide Artificial Intelligence Spending Guide", 07 Mar 2023.

³⁸ <https://medium.com/@channelasaservice/exploring-the-impact-of-ai-on-film-production-in-2024-f02da745af00>

³⁹ <https://www.lexisnexis.com/blogs/gb/b/research/posts/generative-ai-media-production>

⁴⁰ <https://www.dataart.com/blog/balancing-act-the-promise-and-perils-of-generative-ai-in-film-and-tv-by-doron-fagelson#:~:text=Generative%20AI%20can%20help%20with,like%20footsteps%20or%20ambient%20environments>



5.1.1 Pre-Production

Most filmmakers would concur that the most tedious and time-consuming aspects of pre-production are: a) breaking down scripts, b) generating storyboards and shot lists, c) optimizing schedules, and d) creating budgets. AI algorithms can generate script ideas, dialogue, and storyboards, providing filmmakers with a vast array of creative inputs to refine and develop their narratives. Since the releases of "Sunspring" and "Zone Out," AI has made remarkable progress in scriptwriting. In 2019, BAFTA- and Oscar-winning director Kevin Macdonald filmed a sixty-second advertisement for Lexus, entirely composed by AI, which is now seen as a coherent story⁴¹. The Belgian company ScriptBook has introduced their AI scriptwriting tool "DeepStory" for public use⁴². While still in development and currently available only for testing, the quality of generated screenplays is considered average. Nonetheless, it already serves as a creative assistant for filmmakers, game developers, and content creators. AI models like GPT-3 can create story ideas, character backgrounds, and plot twists, offering inspiration to screenwriters⁴³. Furthermore, AI can assist in composing dialogues that match the tone and style of a screenplay, greatly accelerating the scriptwriting process⁴⁴.

The utilization of AI makes the process of script analysis and development more precise and resource-efficient⁴. Current AI algorithms are advanced enough to assist the filmmaking crew with research and organization tasks during the pre-production phase. Using NLP techniques for text analysis, key information elements can be extracted from the script, such as characters and their interactions in scenes, audio effects, necessary props, location descriptions, and further scouting. Through ML algorithms, complex non-linear schedules can be created, considering numerous variables, including the availability of key participants, location availability, budget constraints, and weather. With a holistic approach, AI assistance in preparatory tasks can significantly enhance the film production value chain by optimizing time, reducing overlaps, improving organizational control, and increasing transparency in decision-making⁴⁵.

Generative AI technology plays a significant role also in image creation by offering various capabilities that enhance the creative process. It assists in generating design materials and resources for artists and designers. Utilizing AI picture creation platforms, designers can create a wide range of design elements, such as textures, patterns, and shapes, which can serve as the foundation for their creative projects⁴⁶. AI models such as DALL-E excel at generating images based on text descriptions, broadening the possibilities for concept art, storyboarding, and visual design⁴⁷. One of the key features of generative AI technology is its ability to create images with specific styles. Platforms like DeepArt use neural networks to produce creative visuals inspired

⁴¹ Rose, S. 2020. "It's a war between technology and a donkey" – how AI is shaking up Hollywood.

The Guardian, 16 January 2020. Accessed on 06/06/2024. Retrieved from: <https://www.theguardian.com/film/2020/jan/16/its-a-war-between-technology-and-a-donkey-how-ai-is-shaking-up-hollywood>

⁴² DeepStory. 2022. A tale of co-creation between man & machine. DeepStory website. Accessed on 06/06/2024. Retrieved from <https://www.deepstory.ai/#/>

⁴³ Antony, V. N., & Huang, C.-M. (2023). "ID.8: Co-Creating Visual Stories with Generative AI." arXiv preprint arXiv:2309.14228.

⁴⁴ Coenen, A., Davis, L., Ippolito, D., Reif, E., & Yuan, A. (2021). "Wordcraft: a Human-AI Collaborative Editor for Story Writing." arXiv preprint arXiv:2107.07430.

⁴⁵ Ray, D. 2017. Data Science and AI in Film Production. Medium Magazine, 29 September 2017. Accessed on 5 December 2021. Retrieved from <https://medium.com/rivetai/data-science-and-ai-in-film-production-8918ea654670>

⁴⁶ Archana Balkrishna Yadav "An Analysis on the Use of Image Design with Generative AI Technologies", Vadodara, Gujarat, India. International Journal of Trend in Scientific Research and Development (IJTSRD) Volume 8 Issue 1, January-February 2024 Available Online: www.ijtsrd.com e-ISSN: 2456 – 6470.

⁴⁷ Lyu, Y., Wang, X., Lin, R., & Wu, J. (2022). "Communication in Human–AI Co-Creation: Perceptual Analysis of Paintings Generated by Text-to-Image System." Applied Sciences, 12(22), 11312.



by user-provided input photographs. Techniques like style transfer allow users to combine the content of an input image with the artistic style of another image, resulting in unique and visually appealing artworks¹². Additionally, generative AI technology enables the conversion of image styles, allowing artists to experiment with different artistic styles and aesthetics. By adjusting parameters like style strength and the number of iterations, AI algorithms can generate images with distinct artistic styles, providing artists with a versatile tool for exploring new creative directions¹². At the second “AI on the Lot” conference in Los Angeles⁴⁸, Renard Jenkins, president and CEO of I2A2 Technologies, Labs, and Studios and former executive at Warner Bros and PBS, noted that the fashion industry and other forms of still photography, as well as 2D and 3D animation, have already experienced significant disruption⁴⁹. Widely-used tools such as Midjourney, Stable Diffusion, and OpenAI's ChatGPT are making a big impact.

5.1.2 Production

AI-driven tools are significantly enhancing the efficiency of the film production phase. For example, crew members can use these tools to optimize camera angles and lighting, generate realistic visual effects, and select the best takes from a scene. AI-powered motion systems can detect characters, analyse scenes, and optimize camera movements to meet production objectives. Companies like Axibo are developing advanced camera motion systems that utilize deep learning and AI for object detection and voice recognition³⁷. In addition, Generative AI can streamline the animation process by producing intermediate frames, thus minimizing the manual labour of in betweeners traditionally needed in animation⁵⁰.

AI can create detailed virtual sets and environments, reducing the need for physical locations and sets and even sometimes improve the real scenario by p.e enabling sets that enhance the physical environment and fit within the structure that is there and/or enhance or adapt the footage for a period.

Traditionally, set design in film production has been a multifaceted and expensive process, requiring extensive planning, construction, transportation, and maintenance. Depending on the film's genre and scope, set design can also present creative and technical challenges, such as finding appropriate locations, obtaining permits, ensuring safety, and aligning with the director's vision⁵¹. Physical sets often face limitations related to space, time, and budget, which can impact the quality and variety of the final production. AI-generated environments are digital scenes created using machine learning and deep learning techniques. Filmmakers can leverage AI-generated environments to create more immersive, flexible, and efficient virtual sets compared to traditional methods. AI-generated environments streamline the filmmaking process by reducing the need for physical sets, location shooting and miniature sets. This cuts costs, saves time and allows for more creative freedom in designing worlds. The common techniques that are employed to create such virtual environments include¹⁷:

⁴⁸ <https://www.joinai.la/events/ai-on-the-lot-2024>

⁴⁹ David Bloom, “AI In Hollywood Draws Heavy Crowd For New Kind Of Filmmaking”, May 20, 2024. Accessed on 10/06/2024 at: <https://www.forbes.com/sites/dbloom/2024/05/17/ai-in-hollywood-draws-heavy-crowd-for-new-kind-of-filmmaking/?sh=462d9db722ac>

⁵⁰ Ranzato, M., Szlam, A., Bruna, J., Mathieu, M., Collobert, R., & Chopra, S. (2016). “Video (language) modeling: a baseline for generative models of natural videos.” arXiv preprint arXiv:1412.6604.

⁵¹ Edward Hays, “Virtual Sets and Beyond: The Future of Film Production with AI-Generated Environments”, Aug 7, 2023. Accessed on 11/06/2024 at: <https://medium.com/@toddkslater/virtual-sets-and-beyond-the-future-of-film-production-with-ai-generated-environments-2125bb565492>



- Neural holography, utilizes neural networks to create holographic displays that project 3D images that appears to be projected in the air.
- Neural rendering, utilizes neural networks to synthesize photorealistic images from sparse or incomplete data.
- Neural style transfer, utilizes neural networks to transfer the style of one image to another image.

The creation of such environments starts from the collection of large volumes of data, including images, videos, text, and sound, from online databases, cameras, scanners, and sensors. This data is then labeled, annotated, cleaned, and organized for further processing. The collected data is fed into neural networks, which analyze the information and extract features, patterns, and relationships. The outcome is a model that encapsulates the learned knowledge and can generate new data. The trained model is utilized to create new data that meets specific requirements, such as resolution, quality, style, and content. This newly generated data is then displayed on appropriate devices like screens, projectors, or headsets. AI-generated environments have already been used in the movies “Avatar” (2009), “Ready Player One” (2018) and “The Lion King” (2019).

AI can enhance character performances through digital avatars and virtual actors, enabling the portrayal of characters that may be impossible or impractical with human actors alone. This is possible through the *De-aging* technique of using computer-generated images to rejuvenate (or age) actors without the use of make-up. These avatars, designed to mimic human-like personas, are often hyperrealistic 3D models that use deep learning algorithms to improve business-client interactions⁵². Generative AI avatars are versatile tools used across multiple fields. They enhance customer service, assist professionals with data-driven insights, and create personalized educational content in e-education. In virtual assistance, avatars could make popular assistants like Google Assistant and Siri more relatable. In medical care, they provide emotional support to patients. They also transform gaming and media by creating lifelike non-playable characters (NPCs) and curating multimedia experiences.

AI-powered algorithms analyse user preferences, viewing habits, and behaviour to recommend movies and shows tailored to each user's tastes, thereby boosting user interaction on streaming services⁵³. The AI analyzed social media activity, demographic data, and past engagement metrics to segment the audience. AI goes beyond mere data processing to interpreting information, uncovering audience insights that might otherwise remain hidden. By analysing customer data, AI tools can detect patterns, trends, and preferences, which are crucial for developing personalized and effective marketing strategies. AI tools analyze both historical and real-time data to forecast future behaviors. This predictive capability enables businesses to anticipate market changes, refine their marketing strategies, and stay ahead of the competition. Identifying these patterns helps in creating content and campaigns that strongly resonate with your target audience. Artificial Neural Networks, specifically the Backpropagation Network, has been used for predicting TV audience ratings based on social media data⁵⁴ and the research findings suggest that utilizing Facebook fan page data for

⁵² Shashank Mishra, “The rise of Generative AI Avatars: How Virtual Avatars Are Revolutionizing Digital Interactions”, November 2, 2023. Accessed on 11/06/2024 at: <https://www.iamdave.ai/blog/the-rise-of-generative-ai-avatars-how-virtual-avatars-are-revolutionizing-digital-interactions/>

⁵³ Wang, W., Lin, X., Feng, F., He, X., & Chua, T.-S. (2023). "Generative Recommendation: Towards Next-generation Recommender Paradigm." arXiv preprint arXiv:2304.03516.

⁵⁴ Wen-Tai Hsieh, Seng-cho T. Chou, Yu-Hsuan Cheng, Chen-Ming Wu, “Predicting TV Audience Rating with Social Media”. IJCNLP 2013 Workshop on Natural Language Processing for Social Media (SocialNLP), pages 1–5, Nagoya, Japan, 14 October 2013.



ratings forecasts is feasible, highlighting the potential of AI-driven analysis in understanding audience dynamics and predicting TV audience ratings.

In addition, AI can be used to generate personalized marketing content, including trailers, social media posts, and email campaigns, tailored to different audience segments. In 2023, Deloitte conducted a study⁵⁵ revealing that 41% of marketing, sales, and customer service organizations had either partially or fully integrated generative AI, ranking just behind IT and cybersecurity departments in adoption rates. Similarly, a Salesforce survey⁵⁶ from the same year, which polled 1,000 marketers, indicated that over 50% are currently utilizing generative AI, with an additional 22% planning to do so within the next year. Additionally, a cross-industry survey by Boston Consulting Group in 2023⁵⁷ found that 67% of marketing executives are investigating generative AI for personalization, 49% for content creation, and 41% for market segmentation. Among those already leveraging generative AI, the survey highlighted that between 40% and 50% are using it for social listening, predictive analysis, crafting custom product descriptions, and chatbot marketing. Josie Kaye, a veteran Groundlings performer and an actor, writer, and cinematographer mentioned that she has utilized AI tools to generate social-media content and music videos, including one for an improvisational rapper¹⁵.

5.1.3. Post-Production

In post-production is where the raw material is shaped into a narrative and the sound and visuals are merged. Generative AI simplifies editing procedures by automating tasks such as colour correction, integrating visual effects, adding elements, and enhancing details⁵⁸. Generative AI algorithms boost visual effects in movies by creating realistic CGI elements, improving scene composition, and streamlining post-production workflows, thereby enhancing the overall visual quality of films². AI tools now offer automated video analysis, identifying key scenes and suggesting edits to create engaging scripts. AI based tool are also used in the field of visual effects (VFX) to enhance visual effects by generating realistic simulations of natural phenomena, complex animations, and other visual elements. AI-driven tools, such as GANs, enable the creation of highly realistic 3D elements, ranging from creatures and characters to complete environments, significantly enhancing the visual aspects of films⁵⁹. In addition, AI-powered tools facilitate quick subtitling, dubbing, and accessibility functions such as audio descriptions, ensuring content accessibility for international audiences⁶⁰. Moreover, algorithms are now capable of modifying an actor's lip movements to synchronize with re-recorded dialogue, whether it's by the same actor, a different actor, or in a different language⁶¹.

⁵⁵ Now decides next: Insights from the leading edge of generative AI adoption Deloitte's State of Generative AI in the Enterprise Quarter one report January 2024. Accessed on 12/06/2024 at: <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/consulting/us-state-of-gen-ai-report.pdf>

⁵⁶ Accessed on 12/06/2024 at: <https://www.salesforce.com/news/stories/generative-ai-statistics/#h-marketers-believe-generative-ai-will-transform-their-role-but-worry-about-accuracy>

⁵⁷ David Ratajczak, Matthew Kropp, Silvio Palumbo, Nicolas de Bellefonds, Jessica Apotheker, Sarah Willersdorf, and Giorgio Paizanis, "How CMOs Are Succeeding with Generative AI", JUNE 15, 2023. Accessed on 12/06/2024 at: <https://www.bcg.com/publications/2023/generative-ai-in-marketing>

⁵⁸ Xu, Y., AlBahar, B., & Huang, J.-B. (2022). "Temporally Consistent Semantic Video Editing." arXiv preprint arXiv:2206.10590

⁵⁹ Li, C., Zhang, C., Waghvase, A., Lee, L.-H., Rameau, F., Yang, Y., Bae, S.-H., & Hong, C. S. (2023). "Generative AI meets 3D: A Survey on Text-to-3D in AIGC Era."

⁶⁰ Lin, K., Li, L., Lin, C.-C., Ahmed, F., Gan, Z., Liu, Z., Lu, Y., & Wang, L. (2022). "SwinBERT: End-to-End Transformers with Sparse Attention for Video Captioning." Proceedings of Computer Vision and Pattern Recognition (CVPR) 2022.

⁶¹ Helm, B. 2023. "How AI for Lip Dubbing Could Change the Film Industry." Fast Company. Accessed January 29, 2024. Accessed on 13/06/2024 at: <https://www.fastcompany.com/90981017/ai-dubbing-film-television-marz>.





The use of AI video editing tools tackles several common challenges faced by video editors⁶²:

- AI tools can automate repetitive task, sorting through footage and making basic edits, speeding up the editing process.
- They can assist with synchronizing audio and video, selecting transition frames, and managing dual-track audio-video elements to simplify the process.
- They can enhance videos through tasks like color correction, audio equalization, visual improvements, and background removal, improving the overall quality of the content.
- They can automate tasks such as segment composition, subtitling, video segmentation, and filtering out poor shots, streamlining the workflow.
- They facilitate video manipulation at higher levels of abstraction, such as working with shots and dialogue, music and sound effects.

Furthermore, generative AI has been able to generate music using models like Jukebox and WaveNet, which introduce a new dimension to film scoring and sound effects, adding an unexpected layer of creativity⁶³. Generative AI represents a revolutionary leap in the field of artificial intelligence, marked by its ability to generate new content from existing data. Unlike traditional AI, which primarily focuses on analysing data and recognizing patterns, generative AI can create novel outputs, including images, text, audio, and video. This capability has profound implications for various industries, particularly filmmaking, where creativity and innovation are essential.

The filmmaking industry has always been a pioneer in adopting new technologies to enhance storytelling and production quality. Generative AI is the latest innovation in this lineage, offering new tools and methods to transform the creative process. Generative AI can be leveraged in multiple stages of filmmaking, from pre-production and production to post-production, making the production process more efficient, accessible, and creative. Its ability to automate tasks, enhance visual and audio quality, and provide innovative solutions for storytelling ensures that AI will continue to play a crucial role in the future of filmmaking. As AI technology continues to evolve, it promises to bring unprecedented levels of complexity and artistry to the cinematic experience. However, the adoption of generative AI in the filmmaking industry comes with several implications and impacts for the industry and the people working in it. The following chapter explores those implications and how they affect the future of the industry.

5.2 Implications for the Filmmaking Industry

Generative AI, known for its ability to autonomously create and enhance content, presents significant implications and challenges for the media and film industry. Before addressing them individually in detail we are laying the main implications of the use of generative AI for the film industry below:

- Encouraging Creativity and Artistic Expression

Generative AI fosters new avenues for creative collaboration by enabling artists and AI systems to co-create. It allows artists to explore unconventional styles and territories they may not have ventured into independently. Tools like DALLE and DeepDream enhance artistic capabilities by offering fresh perspectives and aiding in ideation. However, this collaboration prompts discussions on how AI influ-

⁶² Than Htut Soe, "AI video editing tools", University of Bergen, 16/09/2021.

⁶³ Dhariwal, P., et al. (2020). Jukebox: A Generative Model for Music. arXiv:2005.00341.



ences traditional artistic processes and the impact on human creativity¹³. While generative AI can generate content, the role of human creativity remains indispensable. Filmmakers must learn to collaborate with AI tools, using them to enhance rather than replace their creative vision.

- Improving Efficiency and Cost Effectiveness

Generative AI optimizes content creation workflows by automating repetitive and time-intensive tasks. This acceleration potentially reduces production time and costs, offering economic benefits to the industry. However, careful consideration is required to balance automation with the preservation of human creativity and innovation⁶⁴.

- Legal and Ethical Concerns and Bias

The integration of Generative AI in the creative process raises legal and ethical issues. Specifically, raises questions about authorship, copyright, and intellectual property. Clear guidelines and policies are necessary to ensure that the rights of creators are protected. Ensuring AI-generated content respects copyright and does not deceive consumers about its origin is crucial.

Post-production techniques like AI lip sync and dubbing highlight a significant issue of 'theft' within the media industry. For instance, if an algorithm can fluently re-voice a video in another language, it is seen as stealing the work and livelihood of voice performers. When Screen Actors Guild members joined the Writers Guild strike in 2023, this threat of job theft, broadly defined, was a major concern for both Guilds regarding Gen-AI. Actors feared that AI-generated digital likenesses might replace them in major roles, a scenario depicted in Ari Folman's 2013 film *The Congress*, where an out-of-work actor sells the rights to her digital self⁶⁵. Moreover, identifying and mitigating biases in training data is necessary to prevent perpetuating stereotypes and inequalities in generated content⁶⁶.

- Lack of Creativity and Originality

AI's dependence on algorithms and data-driven decisions can result in uniformity, especially in storytelling and scriptwriting. Over-reliance on AI might stifle creativity and originality, producing one-dimensional content and diminishing unique perspectives³⁷.

- Skill Development

As AI tools become more prevalent, there will be a growing need for filmmakers to acquire new skills to effectively utilize these technologies³⁷. Training and education will be crucial in preparing the industry for this transition.

- Societal Impact

The automation of certain aspects of filmmaking may lead to concerns about job displacement and the changing nature of creative work³⁷. Additionally, the Writers Guild expressed concerns that Gen-AI

⁶⁴ Briggs, K., & Kodnani, (2023). "The Potentially Large Effects of Artificial Intelligence on Economic Growth." Goldman Sachs Economics Research.

⁶⁵ Broderick, M., S. M. Bender, and T. McHugh. 2018. "Virtual Trauma: Prospects for Automedia." *M/C Journal* 21 (2). <https://doi.org/10.5204/mcj.1390>.

⁶⁶ Crawford, K., & Calo, R. (2016). There is a blind spot in AI research. *Nature*, 538(7625), 311-313.



could replace background actors, or 'extras,' eliminating their jobs⁶⁷. Writers were worried about studios using Gen-AI to rewrite scripts, generate plot ideas, or even create entire scripts, thereby taking away paid jobs from human writers ⁶⁸.

The Writer’s strike ultimately led to regulations over the use of Gen-AI content, such as prohibiting studios from using Gen-AI to create or revise literary material, denying AI writing credits, and requiring studios to disclose if they were providing Gen-AI material to human writers for further work. Additionally, 'guardrails' were established to prevent studios from using AI likenesses of actors without their consent and compensation⁶⁹.

Despite its promise, Generative AI faces technical limitations. Current AI models may struggle to achieve human-level creativity and deep contextual understanding. Acknowledging these constraints is essential for managing expectations and guiding future advancements. The dynamic landscape of AI challenges in the media and film industry underscores the need for ongoing research and innovation to overcome obstacles and enhance the capabilities of Generative AI⁷⁰. As with any technological advancement, it is crucial to approach its integration thoughtfully, considering both the opportunities and challenges it presents.

5.3 Analysis of the working conditions and AI

The implementation of generative AI in the filmmaking industry introduces a range of implications for working conditions. This analysis examines how generative AI affects job roles, skill requirements, employment patterns, and the overall work environment. It also considers ethical, legal, and social dimensions, ensuring a holistic view of the changes and challenges brought by this technology.

5.3.1 Impact on job roles and skill requirements

5.3.1.1 Job roles

As AI automates or transforms various film production processes, there is a potential risk of human displacement. Traditional roles, such as script analysts and colour correction experts, may see reduced demand for their professional input. Voice cloning, deep fakes, and synthetic video and image production may require less human involvement, necessitating collaboration between actors, filmmakers, and AI. The transformation in various job roles within the filmmaking industry can be both beneficial and disruptive as shown in the table below:

Table 1: Job roles in filmmaking industry

Roles	Benefit	Disruption
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⁶⁷ Rogin, A., and A. Corkery. 2023. "Why Artificial Intelligence is a Central Dispute in the Hollywood Strikes." PBS NewsHour, May 5, 2023. Accessed on 13/06/2024 at: <https://www.pbs.org/newshour/show/why-artificial-intelligence-is-a-central-dispute-in-the-hollywood-strikes>.

⁶⁸ Merchant, B. 2023. "The Writers’ Strike Was a Victory for Humans over AI." Los Angeles Times, September 25, 2023. Accessed on 14/06/2024 at: <https://www.latimes.com/business/technology/story/2023-09-25/column-sag-aftra-strike-writers-victory-humans-over-ai>.

⁶⁹ Coyle, J. 2023. "In Hollywood Writers’ Battle against AI, Humans Win (for Now)." AP News. Accessed January 29, 2024. Accessed on 14/06/2024 at: <https://apnews.com/article/hollywood-ai-strike-wga-artificial-intelligence-39ab72582c3a15f77510c9c30a45ffc8>.

⁷⁰ Hassabis, D., Kumaran, D., Summerfield, C., & Botvinick, M. (2017). Neuroscience-inspired artificial intelligence. Neuron, 95(2), 245-258.



Creative Roles	AI tools can assist in scriptwriting, storyboarding, and visual effects creation, enhancing the creative process by offering new possibilities and efficiencies.	Potential displacement of creative professionals if AI tools are perceived as replacements rather than augmentations of human creativity.
Technical Roles	AI tools can automate certain editing, sound design, and post-production tasks.	Professionals need to adapt to new AI-driven tools, which requires upskilling and continuous learning to stay relevant and effectively use these advanced technologies.
Administrative Roles	AI tools can streamline administrative tasks such as scheduling, budgeting, and resource management.	Necessitates a shift in skill sets towards managing and interpreting AI-generated data.

For example, AI-powered editing tools could decrease the time human editors spend on a project. With new AI standards and tools emerging, skill requirements will shift, compelling filmmakers to learn how to effectively collaborate with AI-powered technologies⁷¹. In areas like voice cloning, deep fakes, and the creation of synthetic videos and images, actors and filmmakers will need to work more closely with AI, potentially reducing the need for human contribution. For instance, the use of AI-driven editing tools can greatly reduce the amount of time human editors spend on a project³⁷.

The perception of job theft was underscored by an incident during the strike when Marvel Studios faced backlash for promoting the AI-created title sequence of its series *Secret Invasion* (2023). Artists who had worked on earlier parts of the show criticized this decision. The visual effects vendor, New Method Studios, had to issue a statement assuring that AI was just one tool among many and did not replace any artists' jobs but rather complemented and assisted their creative teams⁷².

These issues also unfolded against a broader backdrop of intellectual property theft, with a growing movement of artists, writers, and filmmakers who are challenging tech companies for using their work to train AI models without permission or compensation⁷³. In the first case brought by a group of visual artists against this Gen-AI training method, the judge dismissed the lawsuit, advising the plaintiffs to refile due to the language used in their complaint. The judge ruled that while AI-generated material does not infringe copyright, "the AI training process violates their rights"⁷⁴.

AI-driven tools can assist in generating plot ideas, dialogue, and character development, serving as a co-creator alongside human writer. This collaboration can lead to more diverse and innovative narratives. However, scriptwriters must now acquire skills in interacting with AI tools, understanding their suggestions, and refining AI-generated content to maintain human creativity and originality. AI can automate the creation of storyboards and enhance visual effects by generating complex scenes and simulations that would be time-

⁷¹ Baptiste Aelbrecht & Jacques Mojsilovic, "ARTIFICIAL INTELLIGENCE, A NEW ACTOR IN CINEMA AND MOVIE MAKING INDUSTRY", 20 septembre 2023. Accessed on 10/06/2024 at: https://numalis.com/publications-118-artificial_intelligence_a_new_actor_in_cinema_and_movie_making_industry.php

⁷² Giardina, C. 2023. "'Secret Invasion' Opening Using AI Cost 'No Artists' Jobs'." The Hollywood Reporter, June 6, 2023. Accessed on 14/06/2024 at: <https://www.hollywoodreporter.com/tv/tv-news/secret-invasion-ai-opening-1235521299>.

⁷³ Gerrit De Vynck, "AI learned from their work. Now they want compensation." The Washington Post, July 16, 2023. Accessed on 14/06/2024 at: <https://www.washingtonpost.com/technology/2023/07/16/ai-programs-training-lawsuits-fair-use/>.

⁷⁴ Brittain, B. 2023. "Artists Take New Shot at Stability, Midjourney." Reuters, November 30, 2023. Accessed on 14/06/2024 at: <https://www.reuters.com/legal/litigation/artists-take-new-shot-stability-midjourney-updated-copyright-lawsuit-2023-11-30>.



consuming and costly to produce manually. Visual artists and storyboard creators need to adapt by learning to use AI software, focusing more on conceptualization and creative oversight rather than manual execution.

There is a strong influence of "technological solutionism" in the film industry, where the belief prevails that technology can solve many of the world's problems, including the high financial risks associated with green-lighting films⁷⁵. Traditionally, film producers and studios rely on gut feeling and subjective assessments to decide which screenplays to invest in, but this approach often leads to unprofitable outcomes. In recent years, the tech industry has attempted to address this issue using AI, machine learning, big data, and risk analysis. Several start-ups have developed AI-powered platforms to help Hollywood executives predict the potential success of new film projects, aiming to determine whether a film will be a box office hit and whether it should be greenlit. These platforms use analytics based on screenplay content, casting choices, budget considerations, and market trends⁷⁶.

A report by CVL Economics⁷⁷ has highlighted the significant impact that generative AI is expected to have on jobs within the films and animation industry. The report is based on a survey conducted late in 2023, involving 300 leaders from six entertainment industries, including C-Suite executives (such as CEOs, CTOs, CFOs), senior executives, and mid-level managers. Regarding job replacement concerns, the report reveals that 55% of business leaders foresee sound designers facing the highest degree of displacement due to generative AI over the next three years. Furthermore, over 40% of respondents identified the roles of music editors, audio technicians, and sound engineers as particularly vulnerable. In addition, approximately 33% of the surveyed leaders expect songwriters, composers, and studio engineers to be significantly impacted by generative AI within the same timeframe.

The findings from the CVL Economics report suggest that generative AI will significantly transform the landscape of the entertainment industry, particularly in roles related to audio and sound. This technological advancement is poised to enhance efficiency and creativity in content production but also raises concerns about job displacement and the need for professionals to adapt to new AI-driven workflows. As generative AI continues to evolve, industry professionals may need to focus on upskilling and diversifying their expertise to remain competitive. Embracing new technologies and integrating AI tools into their creative processes could help mitigate the risk of job displacement. The potential of generative AI to produce high-quality content in areas such as sound design, dubbing, and music production presents opportunities for creative collaboration between humans and AI. This synergy could lead to innovative outcomes and new forms of artistic expression, ultimately enriching the entertainment industry.

The arts, design, entertainment, and media sectors exhibit a notably high rate of self-employment and non-standard work arrangements compared to other occupational groups. This characteristic plays a significant role in how Generative AI (GenAI) affects job dynamics within these fields. Approximately 29% of workers in the arts, design, entertainment, and media sectors are self-employed or engaged in similar non-standard employment arrangements⁴⁴. This is substantially higher than the 7% average across 22 major occupational

⁷⁵ Chow, Pei-Sze: Ghost in the (Hollywood) machine: Emergent applications of artificial intelligence in the film industry. In: NECSUS_European Journal of Media Studies, Jg. 9 (2020-07-06), Nr. 1, S. 193-214. DOI: <http://dx.doi.org/10.25969/mediarep/14307>.

⁷⁶EVA FREDERICK, "Artificial intelligence predicts which movies will succeed—and fail—simply from plot summaries", 2 AUG 2019. Accessed on 14/06/2024 at: <https://www.science.org/content/article/artificial-intelligence-predicts-which-movies-will-succeed-and-fail-simply-plot>

⁷⁷ CVL Economics, "FUTURE UNSCRIPTED: The Impact of Generative Artificial Intelligence on Entertainment Industry Jobs", January 2024. Accessed on 18/06/2024 at: <https://animationguild.org/wp-content/uploads/2024/01/Future-Unscripted-The-Impact-of-Generative-Artificial-Intelligence-on-Entertainment-Industry-Jobs-pages-1.pdf>



groups. As GenAI tools become more widely adopted and integrated into creative workflows, there is a risk that jobs in these industries may become more precarious. This could manifest in two main ways:

- **Outsourcing:** More work might be contracted out to freelancers, leading to less job security.
- **Decline in Freelance Work:** Conversely, the amount of freelance work available might decline if GenAI tools can efficiently perform tasks traditionally done by freelancers.

The creative industry may experience a transitional period where job security and work availability fluctuate before fully adapting to new production methods enabled by GenAI. GenAI technology's integration into various creative occupations reveals complex trends in job demand and employment growth.

According to CVL report⁴⁴ the roles of software engineers and video game designers have experienced significant AI integration into their workflows and continue to enjoy high labour demand. Workers in these fields are likely to benefit from increased demand for skills that involve both developing and utilizing GenAI technology. On the other hand, despite a 117% increase in AI integration in graphic design roles, demand for graphic designers fell by 3%. This decline may be attributed to other factors but suggests that rapid AI adoption in sectors previously reliant on outsourced graphic design services is reducing the need for human talent as AI-generated content becomes a sufficient substitute. Similar to graphic design, these roles have also seen increased AI integration without corresponding employment growth, indicating potential vulnerability to GenAI technologies. Although AI technologies have been less needed recently for 3D Modelers (where job growth increased by 25% from 2017 to 2022⁴⁴) and Sound Designers (where job growth declined by 3%⁴⁴), the CVL survey results suggest both roles may become increasingly vulnerable over the next three years.

The integration of GenAI into creative roles suggests a shift where certain jobs may become redundant or require new skills. This dynamic presents a challenge for creative workers who must adapt to evolving technological demands. The issue of job displacement due to AI is not limited to creative industries but is likely to affect various high-tech roles across different sectors. This broader economic impact necessitates a comprehensive approach to workforce development and retraining. Based on CVL's survey results 59% of the business leaders surveyed agree that the implementation of AI in their workflows yielded an increase in the efficiency of routine task, 51% that it introduced new task and responsibilities, 49% that their employees needed upskilling or retraining and 43% that it reduced the time spent on repetitive tasks⁴⁴.

Therefore, emphasizing the development of skills that complement GenAI technology will be crucial for maintaining job relevance and security. Furthermore, continuous monitoring of AI integration and job demand trends will help identify emerging vulnerabilities and opportunities. Lastly, implementing supportive policies and programs to assist workers in transitioning to new roles or upgrading their skills will be essential to mitigate the adverse effects of GenAI adoption.

A more detailed mapping of the benefits and disruptions in each function is presented in the table below:

Table 2: Mapping of the benefits and disruptions in each function

Function	Benefit	Disruption
Scriptwriting	AI-driven tools can assist in generating plot ideas, dialogue, and character development, serving as a co-creator, leading to more diverse and innovative narratives.	Scriptwriters must acquire skills in interacting with AI tools, understanding their suggestions, and refining AI-generated content to maintain human creativity and originality.



Storyboarding and Visual Effects	AI can automate the creation of storyboards and enhance visual effects by generating complex scenes and simulations that would be time-consuming and costly to produce manually.	Visual artists and storyboard creators need to adapt by learning to use AI software, focusing more on conceptualization and creative oversight rather than manual execution.
Directing	Leverage AI for tasks such as pre-visualization, shot composition, and editing. AI tools can provide insights and suggestions, streamlining the decision-making process.	Directors must develop the ability to interpret AI-generated options and integrate them into their vision while maintaining the human touch that defines their artistic style.
Editing	AI-powered editing tools can automatically select the best takes, cut scenes, and synchronize audio, reducing the time and effort required for post-production.	Editors must become proficient in using these tools, shifting their focus towards creative decision-making and fine-tuning AI-generated edits to ensure they align with the director's vision.
Sound Design	AI can assist in creating and mixing soundscapes, automating tasks such as noise reduction, audio enhancement, and effects generation.	Sound designers need to understand AI capabilities and integrate them into their workflows, using AI to enhance their creativity rather than replace it.
Post-Production	AI can streamline post-production tasks such as color correction, special effects, and compositing.	Post-production professionals must adapt by learning to work with AI tools, understanding their limitations, and ensuring that the final output maintains high artistic and technical standards.
Scheduling and Resource Management	AI can automate scheduling, manage resources, and optimize production timelines.	Administrative staff must learn to use AI tools for these tasks, ensuring they can interpret AI-generated schedules and make adjustments as needed.
Budgeting	AI can assist in budgeting by analyzing cost data, predicting expenses, and identifying potential savings.	Financial planners and producers need to understand AI-generated financial models and use them to inform their budgeting decisions.
Project Management	AI can streamline project management by tracking progress, identifying bottlenecks, and suggesting improvements.	Project managers must become adept at using AI tools to monitor and guide projects, while also maintaining the ability to make human judgments and decisions.

The integration of generative AI in the filmmaking industry not only raises concerns about job displacement but also introduces significant psychological and social impacts on the workforce.

- **Job Security Concerns:** The fear of job displacement due to automation can cause significant anxiety among workers. Concerns about losing their livelihood and the uncertainty of future employment prospects can affect mental health.



- **Skill Relevance:** Workers may worry about their skills becoming obsolete and the need to continuously adapt to new technologies. This pressure to stay relevant in an evolving industry can be a source of stress.
- **Increased Workload:** While AI can automate repetitive tasks, it can also lead to increased expectations for productivity and performance, potentially resulting in longer working hours and increased pressure to meet higher standards.

AI integration can impact job satisfaction and employee engagement in both positive and negative ways:

- **Enhanced Creativity:** AI tools can handle mundane tasks, allowing filmmakers to focus on more creative and strategic aspects of their work. This shift can enhance job satisfaction and engagement by enabling employees to engage in more meaningful and fulfilling activities.
- **Loss of Autonomy:** The over-reliance on AI for decision-making can reduce employees' sense of autonomy and control over their work, potentially leading to decreased job satisfaction.
- **Skill Development:** Opportunities for learning and development through the use of advanced AI tools can enhance job satisfaction. However, if employees feel inadequately supported or trained to use these tools, it can lead to frustration and disengagement.

5.3.1.2 *Impact of AI on the Workflow of the filming process*

Beyond the work roles in this sector, generative AI also affects the work process itself. This technology allows the workload to be redistributed between the different phases of the filming process, automating routine tasks and allowing professionals to focus on more complex and creative aspects:

- **Automation of Repetitive Tasks:** AI tools can handle repetitive and time-consuming tasks such as data entry, initial editing cuts, and basic sound mixing. This automation reduces the burden on human workers, freeing them to concentrate on tasks that require creativity and critical thinking. For instance, editors can spend less time on basic cuts and more time on crafting the narrative flow and emotional pacing of the film.
- **Enhanced Pre-Production Efficiency:** In the pre-production phase, AI can assist with tasks such as location scouting, script analysis, and scheduling. By automating these activities, AI reduces the pre-production workload and accelerates the planning process, allowing filmmakers to start production sooner and with greater precision.
- **Accelerated Decision-Making:** AI-driven analytics provide real-time insights and recommendations, enabling quicker decision-making. For example, AI can analyze audience preferences and suggest modifications to the script or marketing strategies, allowing filmmakers to adapt swiftly and stay aligned with audience expectations.
- **Improved Accuracy and Quality:** AI tools can enhance the accuracy and quality of various filmmaking tasks. In post-production, AI can identify and correct errors in color grading, audio syncing, and special effects, resulting in higher-quality outputs with fewer revisions. This increased accuracy reduces the need for extensive manual corrections, saving time and resources.
- **Resource Optimization:** AI can optimize the allocation of resources such as time, budget, and personnel. By predicting potential issues and suggesting efficient solutions, AI helps ensure that projects stay on schedule and within budget. This optimization leads to more efficient use of resources and a higher overall productivity rate.



While AI has the potential to enhance creativity, efficiency, and flexibility in the filmmaking industry, it also necessitates careful management of its impacts on job roles, employment patterns, and the work environment. Generative AI can significantly alter the work environment and the nature of collaboration within filmmaking:

- **Team Dynamics:** The integration of AI tools requires effective collaboration between creative professionals and technologists. This necessitates a culture of continuous learning and openness to interdisciplinary collaboration, which can be challenging to cultivate.

Generative AI can influence employment patterns in the filmmaking industry mainly in two ways:

- **Job Creation and Displacement:** While AI can create new job opportunities in areas like AI tool development, data analysis, and tech support, it may also lead to the displacement of certain roles. The net effect on employment depends on how the industry manages this transition and the extent to which it invests in retraining and reskilling its workforce.
- **Freelance and Gig Work:** The flexibility and efficiency offered by AI tools might lead to an increase in freelance and gig work, as filmmakers and production companies can more easily scale their operations up or down. This shift raises questions about job security, benefits, and fair compensation for freelance workers.

5.3.1.3 Skill requirements

The entertainment industries have been incorporating earlier forms of AI technology for years, and the pace of AI integration into creative job roles has been accelerating rapidly. This trend is reflected in a significant increase in job postings that seek candidates with AI-related skills. Between 2020 and 2022, the number of job postings in the entertainment industry that listed the ability to use artificial intelligence tools as a desired skill increased by 122%⁴⁴. Proactive measures can help mitigate the risks of job displacement and support affected workers in transitioning to new roles or industries:

- **Reskilling and Upskilling Programs:** Investing in reskilling and upskilling programs that equip workers with new skills and competencies aligned with emerging technologies can facilitate workforce transitions. Training initiatives focused on AI literacy, data analysis, creative collaboration, and project management prepare workers for evolving job demands.
- **Job Redesign and Task Augmentation:** Redesigning job roles to leverage the strengths of both humans and AI technologies can create new opportunities for meaningful work. Task augmentation strategies involve integrating AI tools into existing workflows to enhance productivity, creativity, and job satisfaction while preserving human agency and expertise.
- **Career Counseling and Transition Support:** Providing career counseling, job placement assistance, and financial support to workers affected by job displacement helps mitigate the social and economic impacts of automation. Guidance on exploring alternative career paths, entrepreneurship opportunities, and life-long learning initiatives empowers workers to navigate transitions successfully.
- **Collaborative Workforce Planning:** Engaging stakeholders across the filmmaking ecosystem in collaborative workforce planning efforts fosters industry-wide resilience and adaptability. Collaboration between employers, labor unions, educational institutions, and government agencies enables the development of holistic strategies for managing workforce transitions and promoting inclusive growth.

Addressing the risks of job displacement associated with the integration of generative AI in the filmmaking industry requires proactive measures and collaborative efforts from stakeholders across the ecosystem. As



generative AI becomes more integrated into the filmmaking process, the skill sets required for various roles are transforming. Key areas of change include:

- **Technical Proficiency:** Professionals need to develop a strong understanding of AI technologies, including how to operate and troubleshoot AI tools. This proficiency involves familiarity with software applications, data analytics, and machine learning concepts.
- **Data Literacy:** With AI's reliance on data, there is an increased need for data literacy. Filmmakers and technicians must be capable of interpreting data outputs as well as being aware of where the source data comes from, understanding AI-generated insights, and making data-driven decisions. This skill is crucial for roles such as editors, producers, and directors who utilize AI for predictive analytics and audience insights.
- **Creative Collaboration with AI:** While AI can automate many tasks, the human element of creativity remains irreplaceable. Professionals must learn to collaborate with AI tools, using them to enhance their creative vision rather than replace it. This collaboration involves understanding AI's capabilities and limitations and integrating AI-generated suggestions into the creative process.
- **Ethical and Responsible AI Use:** As AI raises ethical concerns, such as bias and privacy issues, professionals must be educated on the ethical implications of AI. This education includes understanding how to use AI responsibly, ensuring fair and unbiased outcomes, and maintaining data privacy and security.

Therefore, the introduction of generative AI in filmmaking also creates new roles that blend technical and creative skills:

- **AI Specialists:** These professionals are responsible for developing, maintaining, and optimizing AI tools used in filmmaking. They work closely with creative and technical teams to ensure AI solutions meet the industry's needs.
- **Data Analysts:** Data analysts interpret the vast amounts of data generated by AI tools, providing insights that inform creative and production decisions. They must have a strong understanding of both data science and the filmmaking process.
- **Ethics and Compliance Officers:** As AI introduces new ethical and legal challenges, roles focused on ensuring compliance with regulations and ethical standards become increasingly important. These officers oversee the responsible use of AI, addressing issues such as data privacy, bias, and intellectual property rights.

The integration of generative AI in the filmmaking industry demands a shift in skill requirements and necessitates targeted training programs to equip the workforce with the necessary skills. These programs should cover the following areas:

- **AI Technology Training:** Comprehensive training on the specific AI tools and technologies used in filmmaking is essential. This training should include hands-on workshops, tutorials, and certification programs to ensure that professionals are proficient in using AI software and hardware.
- **Data Analytics and Interpretation:** Training programs should focus on building data literacy skills, teaching professionals how to analyze and interpret data outputs from AI tools. Courses in data science, machine learning, and statistics can provide the foundational knowledge required for these tasks.
- **Creative Workshops:** Workshops that emphasize the collaborative potential of AI and human creativity are crucial. These workshops can demonstrate how AI can enhance creative processes, provide



case studies of successful AI-human collaborations, and offer practical exercises for integrating AI into creative work.

- **Ethics and Compliance Training:** To address ethical concerns, training programs should include modules on the ethical use of AI, data privacy, and compliance with legal standards. These modules can help professionals understand the broader societal impact of AI and ensure responsible usage.
- **Ongoing Professional Development:** Professionals should engage in ongoing professional development to stay updated with the latest AI advancements and industry trends. This development can include attending conferences, participating in webinars, and enrolling in online courses.
- **Cross-Disciplinary Collaboration:** Encouraging cross-disciplinary collaboration can facilitate knowledge sharing and innovation. For example, filmmakers can work with AI specialists to gain deeper insights into AI capabilities and explore new applications in filmmaking.
- **Feedback and Iterative Improvement:** Regular feedback loops and iterative improvement processes can help refine training programs. By gathering feedback from participants and adapting the curriculum based on their experiences, training initiatives can remain relevant and effective.

By focusing on technical proficiency, data literacy, creative collaboration, and ethical AI use, the industry can equip professionals with the competencies needed to leverage AI effectively. Continuous learning, cross-disciplinary collaboration, and iterative improvement of training initiatives are also essential for maintaining a skilled and adaptable workforce.

5.4 Intellectual Property Rights and AI

AI models, trained on vast datasets including texts, images, audio, and videos, may inadvertently produce similar content, raising intellectual property issues through unintentional duplication. Intellectual property infringement is a significant concern. For example, Getty Images and a group of artists have sued Stability AI, a generative AI company, for allegedly using copyrighted images without consent and compensation³⁷. In general, since generative AI can create new content, this raises questions about intellectual property rights, more specifically:

- **Ownership of AI-Generated Content⁷⁸:** Determining who owns the rights to AI-generated content can be complex, especially in cases where AI collaborates with humans in the creative process. Traditional legal frameworks are based on the assumption of human creators, making it challenging to determine authorship rights when AI autonomously generates content. This raises questions about attributing rights and balancing technological contributions with human creativity. Filmmakers, AI developers, and other stakeholders must establish clear agreements on the ownership and distribution of intellectual property resulting from AI-generated outputs.
- **Ambiguity of the originality standard⁴⁵:** The standard of originality, a core aspect of copyright protection, is complicated by generative AI technology. AI's autonomous learning and creative processes, often based on analyzing existing creations, blur the interpretation of the originality standard. Traditional concepts of originality tied to human creative intent face challenges when applied to AI-generated works that lack traditional subjective creative input.

⁷⁸ Jiahao Ni, "Intellectual Property Protection Dilemmas and Legal Response Strategies Under the Perspective of Generative Artificial Intelligence", *Journal of Education, Humanities and Social Sciences*, Volume 28 (2024).



These challenges highlight the need for legal adaptations to accommodate the unique characteristics of generative AI technology while ensuring intellectual property protection and innovation stimulation.

Courts are now grappling with how to apply existing regulations to issues like infringement, usage rights, ownership of AI-created content, and the legality of using copyrighted and trademarked works as training data without permission. Several lawsuits have already emerged⁷⁹. In late 2022, *Andersen v. Stability AI* saw three artists forming a class action against various generative AI platforms for using their unlicensed works to train AI models, resulting in potentially unauthorized derivative works. If deemed infringing, substantial penalties could follow. Other cases from 2023 include Getty's lawsuit against Stable Diffusion's creators for using its watermarked photos without permission, raising both copyright and trademark issues. Companies using generative AI face potential infringement risks, especially if training data includes unlicensed works or if AI-generated content is not protected under fair use. Willful infringement can result in damages up to \$150,000 per instance⁴⁴.

UK copyright law⁸⁰ protects original literary, dramatic, musical, and artistic (LDMA) works, as well as films, sound recordings, broadcasts, and published editions. For LDMA works to be considered original, they must be the result of the author's own intellectual creation, with copyright lasting for the author's life plus 70 years. When AI assists a human in creating LDMA works, provided the human's creativity is evident, the AI is treated merely as a tool, and the work receives the same copyright protection as any other LDMA work, with the rights belonging to the human author. The UK also extends copyright protection to LDMA works generated entirely by computers, provided they meet the originality threshold. This is challenging for generative AI, as the system's output heavily depends on its training data. For example, if a generative AI creates an image of an apple based on its training data, it is uncertain whether this meets the originality criterion.

When this threshold is met, the "author" of a computer-generated LDMA work is the person who made the necessary arrangements for its creation. These works are protected for 50 years from the creation date, which is shorter than the protection for human-assisted works. Entrepreneurial works, unlike LDMA works, do not require originality. Their rights are generally narrower and shorter, depending on the type of work. A recent consultation by the UK Intellectual Property Office⁸¹ on AI and IP concluded that no immediate changes to copyright protection for computer-generated works are necessary but will continue to monitor the situation as AI evolves.

The European Union's recently adopted AI Act⁸² represents a pioneering step in regulating artificial intelligence, establishing a comprehensive framework to govern AI development and use while prioritizing fundamental rights protection. This Act has notable implications for the creative industries, particularly concerning the use of generative AI and copyright issues. Key Provisions of the AI Act included transparency requirements for general-purpose AI (GPAI) systems, limited exceptions for text and data mining and copyright jurisdiction and compliance requirements. In terms of transparency, the act requires that providers of AI tools must publicly provide comprehensive summaries of the datasets used to train their models, including both

⁷⁹ Gil Appel, Juliana Neelbauer, and David A. Schweidel, "Generative AI Has an Intellectual Property Problem" April 07, 2023. Accessed on 17/06/2024 at: <https://hbr.org/2023/04/generative-ai-has-an-intellectual-property-problem>

⁸⁰ <https://www.legislation.gov.uk/ukpga/1988/48/contents>

⁸¹ <https://www.gov.uk/government/consultations/artificial-intelligence-and-ip-copyright-and-patents/outcome/artificial-intelligence-and-intellectual-property-copyright-and-patents-government-response-to-consultation#conclusion>

⁸² https://www.europarl.europa.eu/doceo/document/TA-9-2024-03-13_EN.html#sdocta2



public and private sources. This transparency enables rightsholders to exercise their rights effectively. Furthermore, the act states the development of standardized templates for the training data. The AI Office will develop a template for a questionnaire in order to facilitate compliance and reduce the administrative burden. The template will be summarizing training data, ensuring simplicity and effectiveness while alleviating concerns about excessive detail and effort required from model providers.

In addition, the AI Act extends to challenges regarding balancing innovation and copyright protection. It introduces limited exceptions for text and data mining, particularly for non-commercial research, while ensuring rightsholders' interests are protected. Moreover, providers must obtain authorization from rightsholders for using copyrighted content in training AI models, with certain exceptions under the Copyright in the Digital Single Market (CDSM) Directive. Lastly, the act states that, providers must comply with EU copyright standards regardless of where the training activities occur. This harmonized regulation prevents providers from gaining a competitive advantage through lower copyright standards and promotes fair competition.

The EU AI Act is a significant milestone in AI regulation, particularly for the creative industries. It addresses critical issues such as copyright infringement by generative AI and emphasizes transparency, compliance, and international cooperation. While the Act fosters innovation, it ensures the protection of artists' rights and the integrity of original works. As the AI Act moves towards full implementation, effective collaboration among stakeholders will be essential to uphold a fair and responsible AI-driven creative landscape.

The use of AI in creating film content blurs the lines of traditional copyright ownership. Understanding how intellectual property rights are attributed in AI-generated films is crucial for determining legal responsibilities and ensuring fair compensation for creators. With AI-generated content becoming more prevalent in filmmaking, licensing agreements and distribution rights need to adapt to accommodate the unique nature of AI-generated works. Clear guidelines on licensing AI-generated content and determining distribution rights are essential for industry stakeholders⁴⁵. The ethical implications of using AI in filmmaking, such as potential biases in content generation or the impact on human creativity, should be addressed in the context of intellectual property protection. Balancing technological advancements with ethical considerations is key to fostering a responsible filmmaking environment. Collaboration between filmmakers, AI developers, legal experts, and policymakers is essential to navigate the evolving landscape of intellectual property rights in the film industry. Establishing industry standards and best practices for AI-generated content can help ensure transparency and accountability in intellectual property matters.

The use of AI in art blurs the lines between art, artist, and machine. This raises questions about what constitutes art and who should be credited as the artist. AI-generated content is influenced by the quality and biases of the models and datasets it is trained on. Bias can stem from the training data or user prompts. The widespread use of AI-generated art can undermine the value of human creativity and skills, and can deceive audiences by appearing realistic and convincing. This can lead to misinformation and challenges in distinguishing between genuine and AI-generated content.

In addition, screenwriters argue that AI lacks the human touch necessary for compelling narratives and emotionally resonant characters⁸³. The nuanced understanding of human experiences that artists and writers bring is essential for impactful art. The goal should be to leverage AI to empower artists and writers, providing new tools and opportunities without eroding the foundations of their craft. This symbiotic relationship can

⁸³ Accessed on 18/06/2024 at: <https://cybernews.com/editorial/artificial-intelligence-vs-artistic-integrity/>



lead to unexplored territories of creativity and storytelling. Amidst AI's rise, it is vital to maintain the value and respect for human creativity that brings depth, soul, and resonance to art. The narrative should focus on how AI and human creativity can coexist and collaborate⁴⁹. AI's role in the creative process must be ethically managed to preserve artistic integrity:

- **Creative Autonomy:** Filmmakers should retain creative autonomy and ensure that AI tools are used to support and enhance their vision rather than dictating creative decisions. This balance is critical to maintaining the authenticity and originality of artistic works.
- **Moral and Cultural Sensitivity:** AI applications must be sensitive to moral and cultural contexts. Filmmakers should consider the cultural implications of AI-generated content and ensure it respects the values and norms of diverse audiences.
- **Practical Solutions and Best Practices:** Implementing technological solutions such as AI tools that can detect and flag potentially infringing content or using watermarking techniques for AI-generated works can help mitigate IP infringement issues. Best practices should include establishing clear agreements on IP rights in collaborative projects, ensuring transparency in the use of AI, and adhering to ethical standards in content creation.

The integration of AI into creative industries presents both opportunities and challenges in the realm of intellectual property rights. Legal frameworks must evolve to address the unique issues posed by AI-generated content, ensuring protection for human creativity while embracing technological advancements. By fostering collaboration among stakeholders and establishing clear guidelines, the creative potential of AI can be harnessed responsibly, promoting innovation and maintaining the integrity of artistic expression.

5.5 Recommendations for Ensuring Fair Working Conditions

To address the potential impacts of generative AI on working conditions within the filmmaking industry, it is crucial to implement strategies that prioritize fairness, equity, and well-being for all participants. The following recommendations outline key measures to ensure fair working conditions as AI technologies are integrated into the industry.

1. Promote Inclusive and Transparent AI Deployment

- **Stakeholder Involvement:** Ensure that all stakeholders, including filmmakers, crew members, and support staff, are involved in discussions about AI deployment. This collaborative approach will help identify potential concerns and benefits from multiple perspectives.
- **Transparency in AI Usage⁸⁴:** Maintain transparency about how AI tools are used in various stages of filmmaking. Clearly communicate the roles and limitations of AI, ensuring that human creativity and decision-making remain central to the process.

2. Implement Comprehensive Training Programs

- **Skill Development:** Provide training programs to equip workers with the skills needed to effectively use AI tools. Focus on upskilling current employees and preparing new entrants to the industry for AI-integrated workflows.

⁸⁴ Accessed on 18/06/2024 at: <https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai>



- **Continuous Learning:** Encourage continuous learning and professional development by offering ongoing training opportunities. This ensures that workers can keep pace with evolving AI technologies and industry standards.

3. Establish Ethical Guidelines and Best Practices

- **Ethical AI Usage:** Develop and enforce ethical guidelines for AI usage in filmmaking. These guidelines should address issues such as data privacy, algorithmic bias, and the ethical implications of AI-generated content.
- **Best Practices:** Create best practice frameworks for integrating AI into filmmaking workflows. These frameworks should prioritize fair working conditions, promote creativity, and ensure high-quality outputs.

4. Safeguard Employment and Job Security

- **Job Protection Measures:** Implement measures to protect jobs and prevent displacement due to AI integration. Explore options such as job sharing, reskilling programs, and the creation of new roles that leverage AI technologies.
- **Support Systems:** Establish support systems for workers who may be affected by AI deployment. This includes providing career counseling, job placement services, and financial assistance for those transitioning to new roles.

5. Foster a Collaborative Work Environment

- **Human-AI Collaboration⁵¹:** Promote a collaborative work environment where AI tools are viewed as complementary to human skills. Encourage teamwork and collaboration between human workers and AI systems to enhance productivity and creativity.
- **Recognition and Appreciation:** Recognize and appreciate the contributions of all workers, ensuring that the use of AI does not overshadow the value of human input. Celebrate successes that result from effective human-AI collaboration.

6. Monitor and Evaluate AI Impact

- **Regular Assessments:** Conduct regular assessments to monitor the impact of AI on working conditions. Use these assessments to identify areas for improvement and to ensure that AI integration aligns with fair working condition standards.
- **Feedback Mechanisms:** Establish feedback mechanisms that allow workers to report concerns or issues related to AI deployment. Use this feedback to make necessary adjustments and improvements to AI integration practices.

7. Update legal framework to balance innovation and IP protection⁴⁵

- **Redefine copyright and patent laws:** More flexible and adaptive legal provisions are required to address the challenges posed by AI. This may involve redefining copyright and patent laws to better accommodate the unique aspects of AI-generated content and inventions.
- **International collaboration and legal coordination:** Given the global nature of AI technology and variations in intellectual property laws across jurisdictions, international collaboration and legal coordination are essential. This ensures effective protection of intellectual property rights for AI-created works and inventions on a global scale.



- **Balancing innovation and protection strategies:** It is crucial to find a balance between encouraging technological innovation and protecting intellectual property rights. The legal framework should stimulate innovation in AI while safeguarding the rights of creators and inventors, taking into account public interests and societal well-being.
- **Continuous research and practice:** Addressing the challenges posed by generative AI requires collective efforts, interdisciplinary collaboration, and international cooperation. Continuous research and practice are necessary to understand and respond to the impact of AI on intellectual property law, promoting innovation while protecting intellectual property rights.

8. Align with Broader Policy and Regulatory Frameworks

- **Compliance with Regulations:** Ensure that AI integration in filmmaking complies with existing labor laws, data protection regulations, and industry standards. Stay informed about changes in regulations and adapt practices accordingly.
- **Collaboration with Policy Makers:** Work closely with policymakers to shape regulations that support fair working conditions in the AI-enhanced filmmaking industry. Advocate for policies that promote ethical AI usage and protect workers' rights.

Integrating generative AI into the filmmaking industry offers significant opportunities for innovation and efficiency. However, it is essential to prioritize fair working conditions to ensure that the benefits of AI are realized without compromising the well-being and rights of workers. By implementing these recommendations, the industry can create a balanced environment where AI enhances, rather than disrupts, the creative and collaborative spirit of filmmaking.

6 Social Science and Humanities: relevance & benefits

The Social Sciences and Humanities (SSH), which include disciplines such as psychology, sociology, economics, political science, history, cultural science, arts, law, and anthropology⁸⁵, play an essential role in understanding the social organization of human action and the cultural principles that underlie the governance of societies⁸⁶. These disciplines explore and research on fundamental aspects such as attitudes, values, perceptions, rules, standards, and expectations, while exploring principles such as responsibility, commitment, equity, ethics, and participation. Through this approach, the SSH offer lessons on what societies consider “desirable” and provide a solid basis for influencing policy making through their contact with the human and social dimension.

The integration of SSHs into research programs such as Horizon Europe and Horizon 2020 demonstrates that it is crucial to rely on these disciplines to generate new knowledge, support policy making, and develop key competencies that help find multidisciplinary solutions to societal and technological problems. The benefits of this integration are broad and range from a holistic understanding of complex problems to the ability to

⁸⁵ UNESCO. (2012). *International Standard Classification of Education: ISCED 2011*. UNESCO Institute for Statistics. <https://uis.unesco.org/en/topic/international-standard-classification-education-isced>

⁸⁶ European Commission. (2021). *Horizon Europe Programme Guide*. Publications Office of the European Union. https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/programme-guide_horizon_en.pdf



address societal challenges more effectively and foster innovative solutions through interdisciplinary collaboration⁸⁷.

A key point is that, although technical solutions are essential for the development of new policies, these alone are not sufficient to achieve a significant positive impact on society. The sustainable impacts sought by policymakers rely heavily on the contributions of SSH researchers working in multidisciplinary scientific collaborations. The integration of SSHs has been a precursor in the social acceptability and understanding of technical solutions by end users, thus promoting greater social ownership of these solutions, and at the same time a catalyser to envision and design new use cases and scenarios, much more connected with the European values and European Society.

Social science and humanities research, also plays a prominent role in exploring changes over time and space, and enables the projection of imagined futures. Europe, with its rich history of cooperation and conflict, presents a vast field for studying dynamic cultural interactions and generating inspiring opportunities. Research in these areas helps policy makers design policies that promote employment, combat poverty, and prevent the development of divisions, conflicts, and political and social exclusion. Moreover, this research is vital to address gender, intergenerational, disability, ethnic, or even digital and innovative divides, both in Europe and in other regions of the world.

The Social Sciences and Humanities contribute decisively to five fundamental aspects: i) they offer a deep understanding of the complex social reality in constant change; ii) they highlight the value of the human being in the so-called “knowledge society”; iii) they support informed decision-making, helping to solve public problems; iv) they foster the development of entrepreneurial opportunities; and v) they facilitate the understanding of social challenges, helping to close gaps and consolidate democracy and peace. Thus, the SSH not only enriches the public debate, but are also essential for building fairer, more inclusive and sustainable societies.

The transversal inclusion of SSH in R&D&I projects can help Europe to maintain its values and history, with a strong connection to European society, and at the same time it can offer a unique opportunity for disruptive and responsible research and innovation with a clear distinction between those created in USA and Asia, opening a bunch of new opportunities for the sector and a key element for moving from technology-driven society to an anthropocentric approach to technology.

6.1 Social Science and Humanities and Technology

The rapid development of science and technology in the 21st century has generated deep transformations in many ways in which humans can interact with the physical world and our environment and society. Indeed, we are in the fourth industrial revolution, in which the physical, the cybernetic and the biological are increasingly merging, bringing with them changes that are characterized by the speed, breadth, depth and advancing impact of science and technology on different spheres of society. We are gradually moving towards the so-called fifth industrial revolution (Industry 5.0), in which people collaborate closely, daily and efficiently with artificial intelligence, integrating the sustainability factor and the personalization of production, to generate exactly what the population demands and reduce surpluses that can cause problems for the environment.

One of the key features of Industry 5.0 is the close collaboration between people and artificial intelligence machines. In this evolution, machines do not replace human beings, but complement their skills to make

⁸⁷ European Commission. (2023). *Integration of social sciences and humanities in Horizon 2020: Participants, budget and disciplines*. Publications Office of the European Union. <https://ec.europa.eu>





them more efficient, better able to detect the needs of society and thus customize production to avoid surpluses that endanger the planetary ecosystem. As stated by the European Commission⁸⁸, “An important prerequisite for Industry 5.0 is that technology serves people, rather than the other way around. In an industrial context, it means that technology used in manufacturing is adapted to the needs, and diversity of industry workers, instead of having the worker continuously adapt to ever-evolving technology”. The European Commission also reminds us that in the context of Industry 5.0 is the shift from a technology-led and technology-driven society to an anthropocentric approach to technology. This means that industry and sectors such as technology especially, must consider the social dimension in order to leave no one behind and maintain the European values. This has different implications, including taking into account what people need, respecting their rights and values, and what skills they need to develop to cope with all these advancements.

The Social Sciences and Humanities (SSH) have a crucial impact on the development and implementation of emerging technologies, both in terms of their ability to improve the performance of these technologies, and in terms of critical reflection on their ethical and social implications. A relevant example is how psychologists have contributed to improving the perception and performance of robotic healthcare assistants, or how legal studies have developed legal frameworks for data protection. In addition, psychological research has been key to creating more effective virtual learning environments, and sociology has helped to reduce digital inequalities. In this way, SSHs not only participate in improving technology, but also anticipate and understand the broader social effects of these innovations and the scientific practices that produce them.

On the other hand, social science and humanities not only help us to improve technologies, but are also essential for understanding how we interact with them, including the societal influence on how we interact with them. With their ability to interpret complex systems and their emphasis on the interdependence between the social, cultural, economic and political, SSH are fundamental to ensuring responsible scientific innovation. This is particularly relevant in technologies such as artificial intelligence (AI), which have burst into the public debate, generating uncertainty about who should make decisions and under what regulations. In these cases, policy is often delayed until more information on risks and benefits is available, but social science can offer important lessons on the need for proactive rather than reactive governance.

In addition, SSHs help to understand how society reacts to technological change, whose responses can range from enthusiasm to hostility. People often ask who benefits, what the risks are, and what will happen if something goes wrong, reflecting how public attitudes are intrinsically linked to governance. In recent decades, SSH research has transformed the way governments and companies approach public engagement with science and technology. Dialogue and citizen participation are now prioritized, rather than simply informing or raising awareness.

In this context, SSHs are indispensable to ensure good governance and dynamic and responsible regulation of emerging technologies. Collaboration between STEM (Science, Technology, Engineering and Mathematics) and SSH can not only benefit the public good, but also contribute to a more effective innovation ecosystem. Social science studies help the public understand and embrace new technologies, bringing essential nuances to the understanding of problems and their context, which is key to creating global solutions to challenges such as sustainability, public health or food security.

⁸⁸ Comisión Europea, Dirección General de Investigación e Innovación, Breque, M., De Nul, L. and Petridis, A., (2021) *Industry 5.0 : towards a sustainable, human-centric and resilient European industry*, Oficina de Publicaciones de la Unión Europea, 2021, <https://data.europa.eu/doi/10.2777/308407>



Finally, and linked to the technology advancements in our context, the digital transformation is affecting both science and society. Technologies such as AI, big data and digital twins represent a huge potential for solving global challenges, but they also pose social and ethical challenges. For example, these technologies can change production and consumption practices, raising questions about the distribution of power, accountability and the autonomy of actors involved in the value chain. In addition, digitalisation can accentuate issues such as digital surveillance, consumer control and technological manipulations.

It is important to understand digitalisation from various perspectives: its impact on society, how human issues influence the development of technologies, how technologies affect SSHs, and how SSHs must adapt their methods to address new problems. Together, these dimensions underline the importance of interdisciplinary collaboration, where SSHs not only improve the understanding of technologies, but also help to anticipate and mitigate their possible negative effects.

6.2 Relevance of SSH in technological projects linked to Cultural Heritage

The importance of cultural heritage in our societies is increasingly evident due to its multiple uses and meanings, as well as its role in the historical development of a society and its function in the configuration of its identity, both in individual and collective terms. Nowadays, the Internet and Web 2.0, as well as their derived applications, are increasingly becoming an essential medium for the safeguarding and dissemination of cultural heritage, thanks precisely to their almost global coverage, their multimedia nature, and the possibilities for participation that they provide and offer. This means that in the short and midterm, the Web is beginning to be considered an essential channel for the dissemination, defense and conservation of our cultural heritage. The positive impact that technology can have on the conservation of cultural heritage is therefore evident, for example regarding the so-called digital twins, VR/AR technologies, 3D reconstruction, among other solutions.

In this sense then, and as we have advanced in the previous section, the Social Sciences and Humanities (SSH) are crucial also in these technical environments, offering knowledge beyond the strictly technical, which through the social, cultural and ethical dimension, improve the understanding, preservation and dissemination of cultural heritage in a significant way.

The SSH include disciplines such as history, anthropology and sociology, which provide contextual data that refer to the cultural, historical and social dimension that technological innovations in the field of cultural heritage must take into account to ensure not only understanding but also respect and preservation. Particularly in projects related to digital preservation or virtual reconstructions of cultural heritage sites, this understanding ensures that narratives and representations are accurate, respectful and inclusive of diverse perspectives. The integration of SSH disciplines ensures that technologies capture not only physical aspects, but also intangible aspects such as traditions, customs and social values.

On the other hand, the sensitive nature of cultural heritage also involves disciplines related to law or ethics, which in turn provide frameworks to ensure that these projects and their outputs respect the rights of communities and comply with international standards of protection and respect for cultural heritage. The involvement of SSH experts helps to address issues such as intellectual property rights, data ownership and the representation of marginalized cultures.

Another area where the SSH dimension is relevant is in relation to audiences, i.e., the users who engage with cultural heritage through these technologies. Understanding how different audiences interact with these



technologies and how to design them to improve public engagement, educational outcomes and inclusive participation is an area linked to the SSH disciplines. In addition, SSHs inform storytelling and content presentation strategies that resonate with diverse cultural contexts.

Indeed, SSH are essential to assess the social impact of technology projects related to cultural heritage on communities, particularly those linked to the heritage being preserved or exhibited. Through technological developments together with the SSH dimension it is possible to capture aspects that have to do with the benefits of local communities and the promotion of the cultural continuity of practices and traditions associated with heritage.

Cultural Heritage is much more than digitally preserving spaces, as it combines tangible and intangible content, including history, social interactions and implication, values and even emotions and only through the holistic comprehension of the overall cultural heritage can be digitalized and transformed for the new digital era with all its potential and opportunities.

Technological projects linked to the cultural heritage projects not only seek preservation, but also can contribute to respond to global challenges such as climate change and sustainability among others. This is possible by integrating the SSH as disciplines linked to the human dimension. By understanding how communities relate to their heritage, SSHs can guide users to respect it as well as prevent disaster risk.

For all the above reasons, the integration of SSH in technological projects related to cultural heritage can easily contribute to ensuring that these projects are holistic, culturally sensitive and ethically responsible, while promoting inclusiveness, public participation and sustainable impact, values that are in turn closely aligned with the principles of the New European Bauhaus.

6.3 Integration of SSH dimension in the SCENE project and its modules

As pointed in section 1.4 *Background and objectives of the SCENE Project*, SCENE is a technological project that aims to contribute to a competitive and sustainable European film industry by respecting and preserving cultural heritage. Through cutting-edge technologies such as AI, VR/AR, 3D reconstruction, simulations, the project aims to generate a digital platform in which these technologies are integrated and contribute to the processes of pre-production, production and distribution of films. To this end, the platform integrates different modules that interact with each other and are operated by different profiles and end-users detected within this project (see D.2.2. *End-user needs & requirements.R1* and section 2.3.2 *SCENE end-users*).

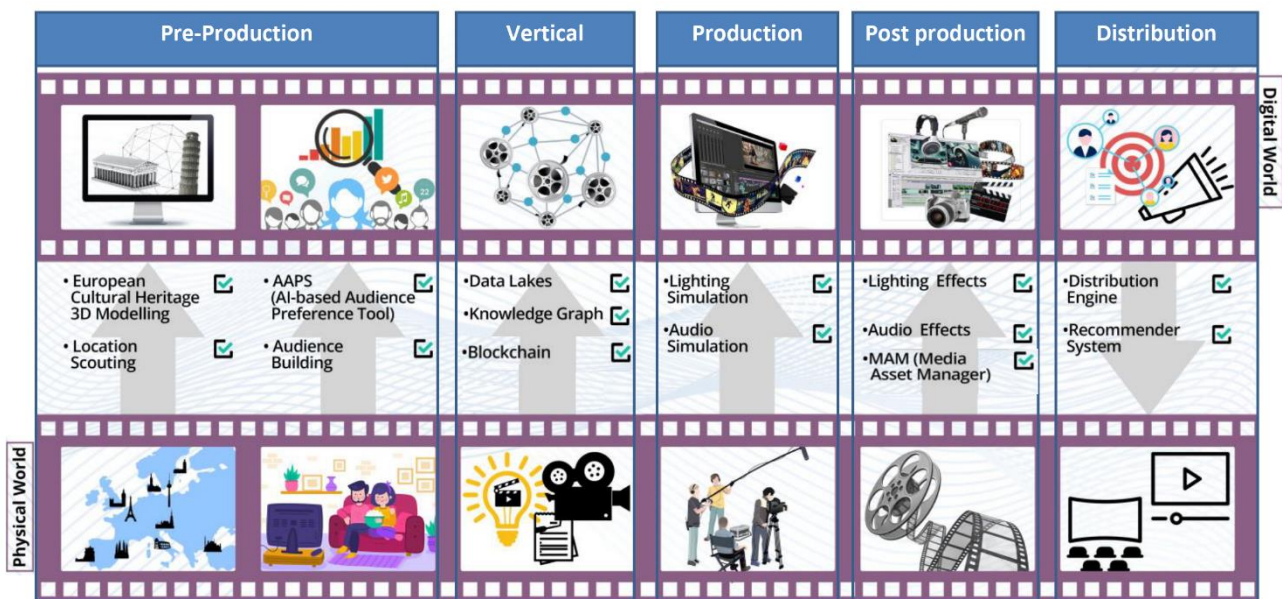


Figure 1: SCENE project components, SCENE project

This section details the contributions linked to the social sciences and humanities dimension to the different modules of the project as well as to the project as a whole. Demonstrating on the one hand, the ability of the SCENE project to take into account dimensions beyond the technological and technical aspects associated with this type of project related to the digitization of processes.

6.3.1 Cultural heritage preservation

As defined in the Deliverable 2.5 *State-of-the-art analysis and Specification of SCENE solutions*, the primary goal of the 3D model reconstruction module of the SCENE project is to generate detailed and accurate 3D representations of cultural heritage sites which includes 3D modeling tools to create comprehensive 3D models that reflect the intricate details of these sites. The aim is to integrate these 3D models into virtual reality (VR) platforms, allowing for immersive and interactive exploration. This will enhance the accessibility and engagement with cultural heritage sites, providing users with a rich and virtual experience. The module uses NeRF, 3D Gaussian splatting, and Photogrammetry in the 3D model reconstruction of the cultural heritage site to provide an approximation as close to reality as possible, allowing creators to achieve unprecedented depth and fidelity in their storytelling.

According to UNESCO definition⁸⁹, “cultural heritage includes artifacts, monuments, a group of buildings and sites, and museums that have a diversity of values including symbolic, historic, artistic, aesthetic, ethnological or anthropological, scientific and social significance”. In fact, as pointed out by UNESCO, cultural heritage is far beyond those physical aspects, as they include intangible elements such as traditions, values, and historical significance that also define its relevance. Technologies, as demonstrated through SCENE project, are capable to offer a visual detailed and identical representation of the site, making more feasible its preservation and accessibility. Despite that, those technologies can’t integrate aspects related to the human approach (non-tangible cultural heritage), deeper and abstracts which also are part of the cultural heritage, such as symbolism, traditions, which are linked to the dimensions that tackle SSH.

⁸⁹ UNESCO Institute for Statistics. (n.d.). *Cultural heritage*. UNESCO. <https://uis.unesco.org/en/glossary-term/cultural-heritage>



More than “only” creating a digital twin of each cultural heritage site, it would be essential to include detailed information on historical, social and cultural aspects to give greater depth and context to the representation. This could be achieved by pointing out the specific areas of the site that have been modified over time due to reconstructions or restorations, or that belong to different historical periods. In this way, a more complete picture of the development of the site over the years can be provided to the creators and end-users of the SCENE platform.

It is important to describe not only the physical structure, but also the uses that the different spaces have had throughout history. For example, indicating what each area was used for, how people interacted with that place at different times, and what changes in society may have influenced its transformation. This approach would integrate intangible elements of heritage, such as local traditions or the cultural context of the time, enriching the user experience and fostering a greater understanding of the cultural and social value of the site.

This integration of historical and cultural elements in the digital twin would allow not only a more accurate representation from a physical point of view, but also a deeper understanding of the context in which these spaces have evolved, connecting the tangible heritage with the intangible aspects that surround it.

The connection between the 3D reconstruction model with the location scouting, with much more capabilities to include additional information related to the spaces, opens a clear opportunity where to explore and exploit the potential of merging tangible and intangible cultural heritage into a single-entry point.

6.3.2 Audience Engagement and Social Responsibility

Audience engagement is an important aspect of the filmmaking process, as it refers not only to the ability to capture attention, but also involves creating meaningful connections between the film and its viewers. In modern cinema, this engagement is multifaceted and begins long before the film's release.

Given the importance within the process, the SCENE project includes the Audience Building Tool (ABT) as well as the AI-based Audience Preferences Scouting module. The ABT is a pre-production self-sustained module that leverages the power of social media and of gamification techniques for assisting filmmakers to understand the audience's interests, to attract and engage audiences, aiming at producing products that will have market success. The AI-based Audience Preferences Scouting module serves to identify the topics that are most likely to engage the audience, offering valuable insights early in the filmmaking process.

On the other hand, and in line with these tools, SCENE has developed the Distribution Engine module, used to propose the audience to be targeted by the filmmakers. The module considers information related to the film (e.g., genre, cast, director, etc.) along with information retrieved from the ABT and campaigns generated by the producers, as well as the prior interest of the different audience groups. In its turn, campaigns integrate gamification techniques to get feedback from your audience before, during and after the production of the film. Through this process, filmmakers are able to perceive their audiences' interactions at all three stages of the film's production, while facilitating the distribution of their news through social media. By including this functionality, SCENE promotes community participation in the process and the transparency of the process itself, which is fully aligned with the values of the New European Bauhaus values of inclusion and sustainability.

These three tools, which are primarily concerned with creator-to-viewer link, draw directly from the digitization process involved in the SCENE project and contribute to offering new opportunities for democratization.



By enabling greater participation in people's processes and decisions, and by enabling cultural content to reach more people according to their interests, context, and preferences.

In fact, to engage a wide and diverse audience, it's essential to ensure that stories reflect a variety of perspectives, cultures, and experiences, as well as consider the cognitive, physical and cultural differences of users. By including SSH dimension it is possible to focus on the user and prioritizes accessibility and inclusivity. This helps viewers feel seen and represented, increasing emotional investment and long-term engagement with the film.

Given that artificial intelligence-based tools are used to analyze audience data or suggest trends, the platform must ensure that algorithms do not reinforce bias or exclude certain demographics. It should be designed with the perspectives offered by SSH disciplines that take into account values such as equity and inclusion, allowing for ethical audience identification that is both accurate and unbiased.

Finally, beyond audience engagement, social responsibility by integrating ethical considerations into the production and distribution processes is also a key aspect. SCENE can encourage filmmakers to create content that reflects the diversity of cultures, genres, ethnicities and perspectives. This can be achieved by providing guidelines or templates that emphasize inclusivity in both storytelling and casting in accordance with the values and principles of the New European Bauhaus. In line with the principles and recommendations of the initiative, provided in *D5.4 Recommendation of NEB values*, can be considered as a socially responsible film platform by incorporating tools that help filmmakers adopt sustainable production methods, such as tracking carbon footprints or providing resources on eco-friendly materials and production practices.

6.3.3 Environmental Sustainability and The New European Bauhaus values

Digitalization offers unprecedented opportunities to manage and control processes more sustainably through the use of artificial intelligence (AI), robots and digital twins, among others. These technologies make it possible to optimize resources and reduce environmental impact. In fact, the SCENE project includes them precisely to achieve these objectives in the European film industry and through the promotion of European cultural heritage.

The SCENE project deploys the Location Scouting tool, a knowledge base that allows users of the SCENE platform (filmmakers, location scouts, producers, etc.) to select the production site as well as specific locations for the different scenes of the film. This database is enriched with a wealth of multimedia content, including photos, videos and 360-degree panoramas. To further enhance the depth of information, metadata is meticulously selected through a combination of deep learning algorithms and manual input from location providers. In addition, the platform offers intricate content tags covering various aspects such as architectural style, emotional associations, materials, colours, etc., providing nuanced information to users through search criteria. These aspects are already included in the SCENE Location Scouting tool and are related to disciplines and expertise that the SSH sector can bring to the table.

Regarding aspects related to sustainability, one of the values of the NEB, the Location Scouting tool provides information that goes beyond the technical and descriptive characteristics of the space, but information related to the green dimension and accessibility. For example, information on vehicle restriction constraints to reduce the environmental impact in a location, nearby suppliers to reduce travel (km 0 products, km 0 extras), suppliers committed to the environment (green producers, green hotels), as well as information on the local context and habitats, or the level of air pollution in the area of the location, among others. Regarding accessibility to make a location more inclusive, location providers could add information on the architectural



barriers of a location (e.g., access, types of surfaces). These criteria will be requested from the location provider when listing the location on the platform itself.

6.4 Impact on Community and Society

The societal challenges and opportunities are those related to the governance of digitization in general and of the physical-digital world, the opportunities for data-driven policy and for data-driven communication. In the data economy we see the new values of data, ranging from being simple records to intelligence, currencies and ultimately governance. In the latter case we can think of AI algorithms or smart contracts that are taking over processes from traditional institutions such as banks, notaries and governments. It is thus clear that the data economy is not only driven by smart technologies, but is challenging governance at several levels at the same time: at the corporate, network, platform, social and ecosystem levels.

Digitalization not only poses technological, economic and social challenges, as it disrupts everyday life, cultural practices and social and economic institutions, but also affects basic concepts and assumptions to which we normally appeal in social scientific research. Examples are the distinctions between human and non-human agents, nature and culture or nature and technology, and our conceptions of agency, control and responsibility. It also calls for reflection on how we interpret and make sense of the world. The conceptual disruption due to digitalization calls for a reflexive turn in social scientific research.

Digitization provides new data sources, research methods and techniques for social scientific research (i.e., digital social science). Alongside the opportunities offered by big data and real-time data coupling for social scientific research, it also offers opportunities to broaden stakeholder inclusion and participation beyond the representation of dominant groups, offers opportunities to co-create and experiment with new technologies through virtual and augmented reality, etc. In short, digitalization offers new opportunities for inclusion and anticipation for responsible or value-sensitive design, along with new opportunities for conducting social scientific research based on big data, AI and many other emerging technologies.

6.5 SSH Recommendations

The inclusion of SSH in technological platforms is important, and even fundamental when tackling with Cultural Heritage, as it is the element responsible for ensuring:

1. The proper understanding of the complex social reality in constant change, and European history, combining tangible and intangible heritage.
2. The value of the human being in the “knowledge society”, especially in Europe.
3. The required holistic information for the decision-making process and policy makers in order to address public social problems.
4. The connection of the proposed innovations with European Society and Values, not only for a more inclusive and responsible innovation, but also as an opportunity to compete with other innovation motors, such as USA and Asia, through different services connected with different values.
5. The direct connection and understanding of social challenges and the sectors they are targeting, reducing the potential barriers, such as legislation, interests and markets.



7 Conclusions

7.1 Fair Working Conditions and CCI sector.

The European Commission stresses that cultural and creative industries (CCIs) are central to human development and to strengthening social and economic cohesion, democracy and inclusion in Europe. Like all sectors, CCIs are subject to general frameworks on fair working conditions, both at European and international level, such as the Universal Declaration of Human Rights and the Charter of Fundamental Rights of the European Union, which define aspects such as the right to a working environment that respects the dignity, safety and health of the worker, with access to adequate and fair remuneration, safe working conditions, and protection against unemployment. However, having analysed the working conditions of the cultural and creative industries (CCI) sector, there are specific problems that hinder the effective application of these principles. Among them, the following stand out:

- The characteristics of the sector: CCIs are characterised by their heterogeneity, the sector is made up of a wide range of disciplines and forms of employment, such as micro-enterprises and freelancers, who in many cases work on a temporary basis or linked to a specific project, unlike other sectors.
- Lack of legal harmonisation: In Member States' legislation, the lack of a common legal framework for the recognition and social protection of artists and cultural workers prevents effective cross-border collaboration and limits the sustainable development of these careers.
- Insufficient recognition and support: Although the role of culture and creativity in social cohesion and economic development is recognised by the European Union, the lack of a coordinated strategy limits the well-being of those who produce and participate in cultural activities. This affects their right to a free and fair environment and puts their professional well-being at risk.
- Need for labour and social reforms: At the international level, organisations such as UNESCO underline that artists, especially women, face low and unstable incomes that affect their access to social security. This context calls for a review of labour protection frameworks that takes into account the particularities of creative careers and their atypical way of working.

As a result, many professionals in the sector face job insecurity, which forces them to take on secondary jobs, in many cases due to economic needs. This situation is especially relevant for vulnerable groups, such as migrant artists and people from difficult socio-economic contexts, who struggle to dedicate sufficient time to their creative occupation. COVID-19 exacerbated these vulnerabilities, generating economic instability and a greater reliance on temporary jobs outside the creative field, which limits dedication to artistic activities.

To address these challenges, the European Commission underlines the importance of ensuring fair working conditions, including stable employment, adequate wages, social protection and professional development opportunities. These conditions are essential not only for the well-being of individual cultural workers, but also for the sustainability and dynamism of a sector that is crucial for cultural diversity and innovation in Europe. To this end, a joint effort between employers, workers and policy actors is key. The European Commission suggests that employers prioritise permanent contracts to provide financial stability and access to benefits such as health and pension, while they should establish clear and flexible working hours that favour work-life balance. It is also important to comply with health and safety regulations to ensure a safe working environment. As regards digital models, the need to compensate creators fairly, adopting transparent revenue-sharing arrangements and ensuring that artists are adequately remunerated is highlighted. At the policy level, a European status for artists is proposed to standardise working conditions across the European Union,



adapting policies to the diversity of sectors and promoting continuous training to facilitate professional development in the CCI. These steps not only improve working conditions, but also recognise the economic and social value of culture.

In conclusion, ensuring fair working conditions for the CCI sector in Europe requires not only recognition of its unique characteristics, but also a harmonised and coordinated approach that promotes the well-being and economic security of cultural and creative workers. The vitality of European culture depends on creating an environment in which artists and creative professionals can freely develop their ideas and aspirations.

7.2 Impact of AI in Fair Working Conditions

The integration of generative AI in the filmmaking industry presents unprecedented opportunities for innovation and efficiency, while also posing significant challenges and ethical considerations. This chapter has outlined comprehensive guidelines for digital tool providers, emphasizing the importance of ethical implementation, data privacy, mitigation of algorithmic bias, and the broader societal impacts of generative AI.

Ensuring that generative AI tools are developed and used responsibly is paramount. This involves adhering to ethical guidelines that prioritize fairness, transparency, and accountability. Protecting user data through robust data collection and storage practices, and ensuring user consent and control, is crucial for maintaining trust and compliance with regulatory frameworks. Addressing sources of bias in AI algorithms and implementing strategies to mitigate these biases are essential for creating equitable and unbiased tools. Considering the societal implications of generative AI, including inclusivity, accessibility, and the potential impact on creative freedom, helps ensure that these technologies benefit all stakeholders in the filmmaking industry. Adopting best practices for development, such as involving diverse teams in AI development and continuously monitoring and improving AI systems, can lead to more effective and responsible AI tools. Learning from real-world examples and established best practices can guide digital tool providers in successfully integrating generative AI into their workflows.

As generative AI continues to evolve, its impact on the filmmaking industry will likely expand, driving further innovation in creative processes, production efficiency, and audience engagement. However, this evolution must be guided by a commitment to ethical principles and a proactive approach to addressing potential risks and challenges.

Digital tool providers, filmmakers, and industry stakeholders are encouraged to collaborate and share knowledge, fostering an environment where generative AI can thrive while upholding the high standards of fairness, transparency, and ethical integrity. By working together, we can harness the transformative power of generative AI to create a more dynamic, inclusive, and sustainable future for the filmmaking industry. In conclusion, the thoughtful and responsible implementation of generative AI offers a pathway to significant advancements in filmmaking. By adhering to the guidelines and best practices outlined in this chapter, digital tool providers can contribute to a thriving, innovative, and ethically sound industry that benefits all participants.

7.3 Including Social Science and Humanities

The Social Sciences and Humanities (SSH), which encompass disciplines such as psychology, sociology, economics, political science, history, law, and anthropology, play a fundamental role in understanding the social organisation and cultural principles that guide societies. These disciplines investigate values, perceptions, social norms and expectations, and contribute to building an ethical and participatory base that is essential for influencing public policy-making and finding solutions to social and technological problems.



The rapid development of science and technology in the 21st century has profoundly transformed the ways in which humans interact with the physical world, the environment and society. We are moving towards the fifth industrial revolution, where collaboration between people and machines, especially AI, will be crucial. In this context, technology must adapt to human needs, not the other way around, which implies a human-centred approach that respects the rights, values and skills needed to cope with these developments.

In this sense, the SSH plays an essential role both in the improvement of emerging technologies and in the ethical and social reflection on their implications. On one hand, SSH are able to promote technologies such as AI to be more effective, responsible and respectful of people's rights, as well as promoting responsible governance based on public participation. On the other hand, digitalisation, driven by technologies such as AI, big data and digital twins, poses ethical and societal challenges, and SSHs help to understand how society reacts to these changes, anticipating their possible negative effects.

If we focus on the field of preservation and dissemination of cultural heritage and technology in which the SCENE project is framed, the approach offered by SSHs is key. Indeed, these disciplines are fundamental to ensure that these initiatives respect the traditions, values and rights of communities, ensuring that the narratives are inclusive and culturally respectful. Furthermore, by including SSH it is also possible to address global challenges such as sustainability and climate change, guided by an understanding of how communities relate to their heritage. In this sense, the integration of HSS in technology projects ensures that they are holistic, ethically responsible and have a sustainable impact, in line with the values of the New European Bauhaus.

Finally, the integration of SSHs in research programmes such as Horizon Europe and Horizon 2020 demonstrates that these disciplines are key to generating interdisciplinary knowledge, supporting informed policy making and promoting innovative solutions that respond to societal challenges. While technical solutions are necessary, they are not sufficient on their own to achieve sustainable impact. Interdisciplinary collaboration, driven by SSHs, facilitates the understanding and acceptance of technical innovations, ensuring a deep connection with European values and promoting ownership among end-users. In addition, SSH research contributes to anticipating and understanding social and cultural changes over time, helping policy makers to design strategies that foster employment, combat poverty and prevent social conflict and exclusion.





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Appendix

Generative AI Implementation Guidelines for Digital Tool Providers

Introduction to the Guidelines

The integration of generative AI into the filmmaking industry presents both significant opportunities and challenges. As digital tool providers develop and deploy AI-driven technologies, it is imperative to establish clear guidelines that ensure these tools are implemented ethically, responsibly, and effectively. This chapter outlines a set of guidelines designed to assist digital tool providers in navigating the complexities associated with generative AI.

These guidelines aim to address critical issues such as data privacy, algorithmic bias, ethical considerations, and societal impacts, while also promoting innovation and efficiency. By adhering to these principles, tool providers can contribute to a more equitable and sustainable filmmaking industry.

The primary objectives of these guidelines are:

- **Ensure Ethical AI Implementation:** Establish ethical standards for the development and deployment of generative AI tools, ensuring they respect human rights and promote fairness.
- **Enhance Data Privacy and Security:** Provide strategies to protect sensitive data, ensuring compliance with data protection regulations and building trust among users.
- **Mitigate Algorithmic Bias:** Offer methodologies to identify and reduce bias in AI algorithms, promoting diversity and inclusion in AI-generated content and decision-making processes.
- **Promote Transparency and Accountability:** Encourage transparent practices in AI tool development and usage, fostering accountability and clarity about the role of AI in the filmmaking process.
- **Support Industry-wide Collaboration:** Facilitate collaboration among stakeholders, including filmmakers, tool providers, regulatory bodies, and end-users, to ensure that AI tools are developed and deployed in a manner that benefits the entire industry.
- **Foster Continuous Improvement:** Advocate for ongoing evaluation and improvement of AI technologies, ensuring they evolve in response to emerging challenges and opportunities.

The rapid advancement of AI technologies necessitates a proactive approach to their implementation. Without clear guidelines, there is a risk of unintended consequences that could negatively impact the filmmaking industry and its stakeholders. These guidelines serve as a foundational framework to:

- **Protect Worker Rights:** Ensure that AI tools enhance, rather than diminish, the working conditions and job security of individuals involved in filmmaking.
- **Safeguard Creative Integrity:** Maintain the creative essence of filmmaking by ensuring AI tools complement human creativity rather than overshadow it.
- **Build Public Trust:** Foster trust in AI technologies by demonstrating a commitment to ethical practices and transparency.
- **Enhance Industry Competitiveness:** Equip digital tool providers with best practices that enable them to develop innovative, high-quality AI tools that meet market needs and regulatory standards.

By adhering to these guidelines, digital tool providers can play a pivotal role in shaping a future where generative AI enhances the filmmaking process while upholding the values of fairness, creativity, and sustainability.



Importance of ethical implementations

As generative AI technologies become increasingly integrated into the filmmaking industry, ethical implementation emerges as a critical concern. The significance of ethical AI deployment extends beyond compliance with legal requirements; it encompasses the broader implications for society, creativity, and the workforce.

1. Protection of Human Rights

Generative AI systems must be designed and deployed in ways that respect and protect human rights. This includes ensuring that AI tools do not perpetuate discrimination, bias, or unfair treatment. Ethical implementation involves:

- **Non-Discrimination:** Developing algorithms that are free from biases related to race, gender, age, and other protected characteristics.
- **Privacy:** Safeguarding personal data used by AI systems, ensuring compliance with data protection regulations such as General Data Protection Regulation (GDPR).
- **Transparency:** Providing clear information about how AI tools operate and make decisions, allowing users to understand and challenge those decisions if necessary.

2. Preservation of Creative Integrity

The essence of filmmaking lies in human creativity and artistic expression. While generative AI can significantly enhance various aspects of the filmmaking process, it is crucial that these technologies complement rather than replace human creativity. Ethical implementation ensures that:

- **Human-AI Collaboration:** AI tools are designed to assist filmmakers, enhancing their creative capabilities without overshadowing their artistic input.
- **Authenticity:** AI-generated content maintains the authenticity and originality that are hallmark traits of creative works.

3. Job Security and Fair Working Conditions

The introduction of AI technologies can lead to changes in job roles and responsibilities. Ethical implementation is vital to ensure that these changes do not result in job displacement or deterioration of working conditions. Key considerations include:

- **Reskilling and Upskilling:** Providing training programs to help workers adapt to new technologies and acquire the necessary skills to thrive in an AI-enhanced environment.
- **Fair Compensation:** Ensuring that the economic benefits of AI are equitably distributed, providing fair compensation for all contributors in the filmmaking process.

4. Public Trust and Acceptance

Building public trust is essential for the widespread acceptance and success of generative AI in filmmaking. Ethical implementation practices play a crucial role in:

- **Transparency and Accountability:** Ensuring that AI systems are transparent in their operations and accountable for their outputs, fostering trust among users and the general public.
- **Ethical Standards:** Adhering to high ethical standards, demonstrating a commitment to responsible AI use, and addressing public concerns about the potential negative impacts of AI.

5. Sustainable Industry Development



The long-term sustainability of the filmmaking industry depends on the responsible and ethical deployment of AI technologies. Ethical implementation can:

- **Promote Innovation:** Encourage the development of innovative AI tools that enhance the industry's capabilities while respecting ethical boundaries.
- **Regulatory Compliance:** Ensure that AI tools meet legal and regulatory standards, avoiding potential legal issues and fostering a stable development environment.
- **Industry Reputation:** Ensure the reputation of the filmmaking industry as a leader in ethical technology use, setting a positive example for other sectors.

Ethical implementation of generative AI in filmmaking is not merely a regulatory requirement; it is a fundamental necessity for the protection of human rights, preservation of creative integrity, job security, public trust, and sustainable industry development. By prioritizing ethical considerations, digital tool providers can contribute to a future where AI technologies enhance the filmmaking process while upholding the values and principles that define the industry. The subsequent sections will provide detailed guidelines and best practices for achieving ethical AI implementation in the filmmaking industry.

Data Privacy considerations

The integration of generative AI into the filmmaking industry brings significant advantages, but it also raises critical concerns about data privacy. Ensuring that data privacy considerations are addressed is essential for protecting personal information and maintaining trust among stakeholders. This section outlines key data privacy considerations for digital tool providers involved in the SCENE project.

1. Compliance with Data Protection Regulations

Adherence to data protection regulations is fundamental for any AI implementation:

- **General Data Protection Regulation (GDPR):** As a cornerstone of data privacy law in the EU, GDPR mandates stringent requirements for data processing, consent, and individual rights. Compliance involves:
 - **Data Minimization:** Collecting only the data necessary for the intended purpose.
 - **Consent:** Obtaining explicit consent from individuals before processing their data.
 - **Data Subject Rights:** Ensuring individuals can access, correct, and delete their data.

2. Data Anonymization and Pseudonymization

To protect personal information, data used in AI processes should be anonymized or pseudonymized whenever possible:

- **Anonymization:** Removing or modifying personal identifiers to prevent the identification of individuals.
- **Pseudonymization:** Replacing private identifiers with fake identifiers or pseudonyms, making it harder to trace the data back to specific individuals while retaining the data's utility for analysis.

3. Secure Data Storage and Transmission

Ensuring the security of data at rest and in transit is crucial to prevent unauthorized access and data breaches:

- **Encryption:** Using robust encryption methods for data storage and transmission to protect sensitive information from unauthorized access.



- Access Controls: Implementing strict access controls to ensure that only authorized personnel can access sensitive data.
- Regular Audits: Conducting regular security audits to identify and address potential vulnerabilities in data storage and handling processes.

4. Data Governance Policies

Establishing clear data governance policies helps manage data effectively and ensure compliance with privacy standards:

- Data Management: Developing a comprehensive framework that outlines the processes for data collection, storage, usage, and disposal.
- Accountability: Assigning data privacy officers or responsible teams to oversee data governance and ensure compliance with data protection regulations.
- Documentation: Maintaining thorough documentation of data processing activities, consent forms, and privacy impact assessments.

5. Transparency and User Awareness

Building transparency and raising user awareness about data privacy practices is essential for maintaining trust:

- Privacy Policies: Creating clear and concise privacy policies that explain how data is collected, used, and protected.
- User Notifications: Informing users about data collection practices and any changes to data privacy policies.
- Education: Educating users and stakeholders about their data rights and how their data will be used by AI tools.

6. Handling Sensitive Data

Special care is required when dealing with sensitive data such as biometric information, health data, or data related to minors:

- Sensitive Data Protocols: Implementing additional safeguards for handling sensitive data, including stricter access controls and enhanced encryption.
- Consent for Sensitive Data: Ensuring explicit and informed consent is obtained before processing any sensitive data.

Data collection and storages practices

Implementing generative AI in the filmmaking industry necessitates robust data collection and storage practices to ensure data privacy and security. This section outlines practices for collecting and storing data, emphasizing compliance with legal standards and ethical considerations.

1. Principles of Data Collection

Data collection should be guided by clear principles to ensure it is lawful, fair, and transparent:

- Purpose Limitation: Collect data only for specified, explicit, and legitimate purposes. Avoid collecting data that is not necessary for achieving these purposes.
- Data Minimization: Collect the minimum amount of data required to achieve the intended purpose. This reduces the risk of data breaches and enhances privacy.



- Transparency: Inform data subjects about the purpose of data collection, how their data will be used, and their rights. Use clear and accessible language in privacy notices.

2. Obtaining Consent

Obtaining informed consent from data subjects is critical to ensure ethical data collection:

- Explicit Consent: Obtain explicit consent from individuals before collecting their data. This includes explaining the purposes of data collection and how the data will be used.
- Withdrawal of Consent: Allow individuals to withdraw their consent at any time and ensure that their data is deleted if they do so.

3. Data Anonymization and Pseudonymization

Protecting the identities of data subjects through anonymization and pseudonymization is essential:

- Anonymization: Remove or alter personal identifiers to ensure data cannot be traced back to an individual. This includes removing names, addresses, and other identifying information.
- Pseudonymization: Replace personal identifiers with pseudonyms or codes, which allows data to be used for analysis without revealing the identities of individuals. Ensure that the pseudonyms cannot be easily traced back to the original identifiers.

4. Secure Data Storage Practices

Implementing secure data storage practices helps protect data from unauthorized access and breaches:

- Encryption: Encrypt data at rest and in transit using strong encryption protocols to protect it from unauthorized access. This includes encrypting databases, backups, and data transmissions.
- Access Controls: Implement strict access controls to limit who can access the data. Use role-based access controls (RBAC) to ensure that only authorized personnel have access to sensitive data.
- Regular Backups: Regularly back up data to prevent data loss in case of hardware failures or other incidents. Ensure that backups are also encrypted and stored securely.
- Audit Logs: Maintain audit logs to track access and modifications to the data. This helps detect unauthorized access and provides a record for auditing purposes.

5. Data Retention and Deletion

Establishing clear policies for data retention and deletion is crucial for data privacy:

- Retention Policies: Define and document data retention policies that specify how long data will be kept. Retain data only as long as necessary to fulfill the purposes for which it was collected.
- Secure Deletion: Ensure that data is securely deleted when it is no longer needed. Use methods such as data wiping or shredding to ensure that deleted data cannot be recovered.

6. Compliance with regulations

Ensure that data collection and storage practices comply with relevant data protection regulations:

- GDPR Compliance: Adhere to the General Data Protection Regulation (GDPR) requirements, including data subject rights, data protection impact assessments (DPIAs), and reporting data breaches within 72 hours.



- Other Regulations: Comply with other applicable data protection laws and regulations, such as the ePrivacy Directive, HIPAA, or local data protection laws in the regions where data is collected and stored.

Addressing Algorithmic bias

The effectiveness of generative AI can differ based on the specific task and language involved. This technology relies on vast amounts of Internet data for learning, which can unintentionally introduce biases. As a result, it may favour certain user groups or reinforce existing stereotypes. A significant challenge in developing and deploying AI systems is bias, which refers to systematic errors in decision-making processes that result in unfair outcomes. Bias in AI can stem from several sources, including data collection, algorithm design, and human interpretation. Machine learning models, a subset of AI, can learn and perpetuate patterns of bias present in their training data, leading to unfair or discriminatory results⁹⁰. Addressing algorithmic bias is crucial for ensuring fairness, accuracy, and ethical integrity in AI applications. This chapter explores the sources of bias in generative AI and presents strategies for mitigating these biases.

Sources of Bias in Generative AI

Bias in generative AI can originate from several sources, affecting the outputs and potentially leading to unfair or discriminatory outcomes. Understanding these sources is the first step toward mitigating bias.

1. Training Data Bias

Data bias happens when the training data for machine learning models is either unrepresentative or incomplete, resulting in biased outputs⁴⁷, and may occur when the data are coming from biased sources, the data are incomplete, missing important information and/or contain errors. The training data bias may come in several forms; however, the main suspects are historical bias, representation/selection bias and measurement/labelling bias^{91,92, 47, 93}.

The training data may reflect historical biases present in the real world. For example, if the data used to train the AI system includes biased representations or stereotypes, the AI may learn and replicate these biases. An example is the 2016 paper "Man is to Computer Programmer as Woman is to Homemaker," which demonstrated that word embeddings trained on Google News references perpetuate gender stereotypes.

Representation/selection bias arises from how we define and sample a population to create a dataset. For instance, Amazon's facial recognition struggled with darker-skinned faces because the training data primarily included white faces⁹⁴. Another example is data collected through smartphone apps, which can underrepresent lower-income or older demographics. The data selected for training may not be representative of the entire population. This can occur if certain groups are underrepresented or overrepresented in the training dataset.

⁹⁰ Ferrara, E. (2023). Fairness And Bias in Artificial Intelligence: A Brief Survey of Sources, Impacts, And Mitigation Strategies.

⁹¹ <https://towardsdatascience.com/understanding-bias-and-fairness-in-ai-systems-6f7fbfe267f3>

⁹² <https://www.anecdotes.ai/post/generative-ai-bias#:~:text=Historical%20biases%20arise%20from%20historical,biases%20present%20in%20that%20data.>

⁹³ <https://plat.ai/blog/bias-and-fairness-in-ai-algorithms/>

⁹⁴ James Vincent, "Gender and racial bias found in Amazon's facial recognition technology (again)", Jan 25, 2019. Accessed on 10/06/2024 at: <https://www.theverge.com/2019/1/25/18197137/amazon-rekognition-facial-recognition-bias-race-gender>



Measurement/Labeling bias can be introduced during the data labeling process if the labels reflect subjective judgments or cultural biases of the annotators. Data which is most readily accessible is frequently an imperfect and indirect representation of the true characteristics or variables that researchers or models are trying to measure. This accessible data may include irrelevant or extraneous information ("noise"), which can obscure the accurate and relevant information ("signal") that is needed for precise analysis or predictions. Moreover, measurement processes and data quality can vary across groups. This bias is particularly harmful in applications like predictive policing. A 2016 ProPublica report⁹⁵ found that using proxy measurements in predicting recidivism led to harsher sentences for black defendants compared to white defendants for the same crimes.

2. Algorithmic Bias

Algorithmic bias occurs when machine learning algorithms have intrinsic biases that are mirrored in their outputs⁴⁷. This can arise from biased assumptions or the use of biased criteria in decision-making and can emerge even with perfect data. It may be distinguished in evaluation and aggregation bias^{48,49,50,47}.

Evaluation bias happens during model iteration and evaluation when benchmarks do not represent the general population or are inappropriate for the model's intended use. For instance, imagine a machine learning model being developed to predict nationwide voter turnout. The developers choose various features like age, profession, income, and political alignment to predict if someone will vote. However, if the developers only test their model on individuals from their local area, they unintentionally create a system that is only effective for that specific group, thereby neglecting other regions of the country.

Aggregation bias occurs when distinct populations are inappropriately combined. For instance, health care models using Hemoglobin A1c (HbA1c) levels for diabetes predictions show bias because these levels vary across ethnicities. To address this, it is crucial to either include ethnicity as a feature in the data or develop separate models for each ethnic group. Therefore, a single model is unlikely to suit all groups⁵⁰, yet data is often aggregated for simplicity. Another example involves analyzing salary increases based on employee tenure. A model might show a strong correlation between tenure and salary in fields like finance, IT, and education, where longer tenure generally leads to higher pay. However, this pattern does not hold for athletes, who earn high salaries early in their careers and see earnings decline as they age and retire. Aggregating data from athletes with other professions can result in an AI model that is biased against them.

Basically, the biases described above result from:

- The Model Architecture: Certain model architectures may inadvertently favor particular patterns or features in the data, leading to biased outcomes.
- The Training Process: The process of training AI models can introduce bias, especially if the algorithms are not designed to account for imbalances in the training data.
- The Feature Selection: The choice of features used in the model can introduce bias if these features are correlated with sensitive attributes such as race, gender, or socioeconomic status.

3. Deployment Bias

⁹⁵Julia Angwin, Jeff Larson, Surya Mattu and Lauren Kirchner, ProPublica, May 23, 2016. Accessed on 10/06/2024 at: <https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>



Deployment bias is a form of bias in the AI lifecycle that emerges independently of the data pipeline⁹⁶. User bias happens when individuals using AI systems inject their own biases⁴⁷, either knowingly or unknowingly. This can occur through the provision of biased training data or interactions that reflect personal prejudices⁴⁷. Contextual Bias can emerge when AI systems are deployed in contexts different from those in which they were trained. The system may not perform equally well across different user groups or environments.

Strategies for Mitigating Bias

Mitigating bias in generative AI involves a multi-faceted approach, addressing the various sources of bias throughout the AI development lifecycle.

1. Diverse and Representative Data Collection

- Inclusive Data Sampling: Ensure that training data includes diverse and representative samples from all relevant groups. This helps in minimizing selection bias and ensuring that the AI system performs well across different demographics.
- Bias Audits: Conduct regular audits of the training data to identify and address any biases. This involves analyzing the data for underrepresentation or overrepresentation of certain groups and making necessary adjustments.

2. Fair and Transparent Data Labeling

- Standardized Labeling Protocols: Implement standardized and objective labeling protocols to minimize subjectivity and cultural biases. This can include clear guidelines and training for data annotators.
- Diverse Annotator Pool: Use a diverse pool of annotators to label the data, ensuring that multiple perspectives are considered during the labeling process.

3. Algorithm Design and Training

- Bias Detection Algorithms: Integrate bias detection algorithms into the AI development process. These algorithms can identify and flag biased outcomes during training, allowing for corrective measures.
- Fairness Constraints: Apply fairness constraints and regularization techniques to the model to ensure that it does not disproportionately favor or disadvantage any particular group.

4. Continuous Monitoring and Evaluation

- Performance Metrics: Develop and use performance metrics that specifically measure the fairness of the AI system. This includes evaluating the system's performance across different demographic groups.
- Post-Deployment Audits: Conduct regular audits of the AI system post-deployment to monitor for any emerging biases. This involves continuous evaluation and refinement of the model based on real-world performance.

5. User Feedback and Involvement

- User-Centric Design: Involve users in the design and evaluation process of the AI system. This includes gathering feedback from diverse user groups and making necessary adjustments based on their input.
- Transparency and Explainability: Enhance the transparency and explainability of AI systems, allowing users to understand how decisions are made. This helps in building trust and allows users to identify and report any biased outcomes.

6. Ethical and Regulatory Compliance

⁹⁶ <https://knowledge.dataiku.com/latest/ml-analytics/responsible-ai/concept-deployment-biases.html>



- **Adherence to Standards:** Ensure that AI systems comply with ethical standards and regulatory requirements related to fairness and non-discrimination. This includes adhering to guidelines such as the EU's General Data Protection Regulation (GDPR) and the AI Ethics Guidelines.
- **Ethics Review Boards:** Establish ethics review boards to oversee the development and deployment of AI systems. These boards can provide independent assessments of the potential biases and ethical implications of AI applications.

Addressing algorithmic bias is essential for the ethical and equitable implementation of generative AI in the filmmaking industry. By understanding the sources of bias and implementing comprehensive mitigation strategies, digital tool providers can develop fairer and more inclusive AI systems. The subsequent chapters will delve into the societal impacts of generative AI and provide further guidelines for responsible AI implementation within the SCENE project.

Societal Impacts of the Generative AI

The integration of generative AI into the filmmaking industry brings about significant societal implications.

Beyond the immediate workplace, the integration of AI in filmmaking has broader societal implications, as such:

- **Cultural Shifts:** The widespread use of AI in creative industries like filmmaking can lead to cultural shifts in how films are produced, consumed, and valued. These changes can influence societal perceptions of creativity and the role of human artists.
- **Ethical Considerations:** The use of AI raises ethical questions about authorship, originality, and the value of human creativity. Society must grapple with these questions to ensure that technological advancements do not undermine the cultural and artistic significance of filmmaking.
- **Social Equity:** The benefits and challenges of AI integration are not evenly distributed across society. Ensuring that the advantages of AI are accessible to all, and addressing the potential for increased inequality, is crucial for fostering social equity.

These impacts extend beyond the technical aspects and influence various dimensions of society, including inclusivity, accessibility, and creative freedom. Understanding these societal impacts is essential for fostering an ethical and equitable digital transformation in the filmmaking industry.

Inclusivity and Accessibility

Generative AI is transforming the filmmaking industry by enhancing inclusivity and accessibility. This chapter explores how AI democratizes access to advanced tools, enabling diverse creators to participate in filmmaking. It discusses the role of AI in bridging language and cultural barriers, improving accessibility features for people with disabilities, and reducing biases in content creation. Additionally, it addresses the challenges of the digital divide and ethical data use, highlighting the importance of equitable technology distribution and responsible AI practices in fostering an inclusive media landscape

1. Broadening Participation

- **Access to Tools:** Generative AI can democratize access to advanced filmmaking tools, enabling a wider range of individuals to participate in the filmmaking process. This includes independent filmmakers, small production houses, and creators from diverse backgrounds who may have previously been excluded due to cost or resource constraints.



- Language and Cultural Representation: AI-driven tools can help bridge language and cultural barriers, allowing for more diverse and inclusive storytelling. Automated translation and localization services powered by AI can make films more accessible to global audiences, promoting cultural exchange and understanding.

2. Addressing Barriers

- Accessibility Features: Generative AI can enhance the accessibility of filmmaking tools for people with disabilities. Features such as voice recognition, automated subtitling and/or scripting, voice controls, and audio descriptions can make both the creation and consumption of films more inclusive.
- Reducing Bias: By actively identifying and mitigating biases in AI systems, the industry can ensure that AI-generated content does not perpetuate stereotypes or exclude marginalized groups. This contributes to a more inclusive media landscape.

3. Challenges and Considerations

- Digital Divide: While generative AI has the potential to increase accessibility, it is essential to address the digital divide. Ensuring that all filmmakers have access to the necessary technology and training is crucial for true inclusivity.
- Ethical Use of Data: Protecting the privacy and rights of individuals whose data is used to train AI systems is paramount. Ethical data practices must be implemented to avoid exploitation and ensure that the benefits of AI are equitably distributed.

The current practice of using large, unfiltered data sets for AI training may change due to legal pressures and ethical concerns. Experts suggest that future AI models will rely on more curated and controlled data sets. The lack of transparency about what data is used for training complicates efforts for creators to receive proper compensation. The ongoing legal battles and proposed regulations could reshape how AI models are developed and the rights of content creators in the digital age³⁹.

Implications for creative freedom

Generative AI is poised to revolutionize creative freedom in filmmaking, offering both enhancements and potential constraints. This chapter examines how AI can expand creative possibilities by aiding in idea generation, script development, and visual effects, while also fostering collaborative creativity. However, it also addresses the risks of content standardization and over-reliance on technology, which could stifle originality and diminish human creativity. Ethical and artistic considerations, such as intellectual property rights and maintaining creative autonomy, are critical to ensure AI serves as a supportive tool rather than a limiting force. Understanding these implications is essential for fostering a balanced and innovative filmmaking ecosystem.

1. Enhancing Creativity

- New Creative Possibilities: Generative AI can expand the creative toolkit available to filmmakers, offering new ways to generate ideas, develop scripts, and create visual effects. AI can assist in tasks such as storyboarding, character design, and scene composition, enhancing the creative process.
- Collaborative Creativity: AI tools can facilitate collaboration among filmmakers by providing a common platform for sharing and developing ideas. This can lead to more innovative and diverse storytelling as creators from different backgrounds contribute their unique perspectives.

2. Potential Constraints



- **Standardization of Content:** There is a risk that AI-generated content may become homogenized, leading to a standardization of creative outputs. This could stifle originality and lead to a less diverse media landscape if not carefully managed.
- **Dependence on Technology:** Over-reliance on AI tools may diminish the role of human creativity and intuition in the filmmaking process. It is important to maintain a balance where AI serves as a tool to augment human creativity rather than replace it.

3. Ethical and Artistic Considerations

- **Intellectual Property:** The use of AI in the creative process raises questions about intellectual property rights. Determining ownership of AI-generated content and ensuring fair compensation for creators are critical issues that need to be addressed.
- **Creative Autonomy:** Filmmakers must retain control over their creative vision. AI tools should be designed to support and enhance the creative process without imposing limitations or altering the creator's original intent.

The societal impacts of generative AI in the filmmaking industry are profound, influencing inclusivity, accessibility, and creative freedom. By understanding and addressing these impacts, digital tool providers can contribute to a more equitable and innovative filmmaking ecosystem. The following chapters will delve deeper into the practical implementation of these guidelines, providing actionable insights for ensuring responsible and ethical use of generative AI in filmmaking projects dealing with new technologies.

Practical recommendations for tool providers

In order to effectively integrate generative AI into filmmaking tools while addressing ethical, societal, and technical considerations, it is essential for tool providers to adopt a set of practical recommendations. These guidelines will ensure that the development and deployment of generative AI technologies contribute positively to the filmmaking industry and its stakeholders.

Best practices for development

1. User-Centered Design

- **Engagement with Stakeholders:** Regularly engage with filmmakers, technicians, and end-users throughout the development process to gather feedback and ensure the tools meet their needs and expectations.
- **Iterative Prototyping:** Use iterative design methodologies, where feedback is incorporated at multiple stages, to refine and enhance the functionality of AI tools.

2. Ethical AI Development

- **Bias Mitigation:** Implement strategies to identify and mitigate biases in AI algorithms. This includes using diverse datasets, conducting bias audits, and incorporating fairness metrics.
- **Transparency and Explainability:** Develop AI systems that are transparent and can provide explanations for their decisions and outputs. This helps build trust and allows users to understand how the AI operates.

3. Robust Data Management

- **Data Privacy:** Ensure that all data collection and usage practices comply with data protection regulations. Secure user consent and provide clear information on how data will be used.
- **Quality Assurance:** Implement strict data quality standards to ensure that the AI systems are trained on accurate and representative data. This reduces the risk of errors and biases.

4. Performance Optimization





- Scalability: Design AI tools to be scalable, allowing them to handle large volumes of data and multiple users without compromising performance.
 - Efficiency: Optimize AI algorithms for efficiency, ensuring that they can deliver high-quality results quickly and with minimal computational resources.
- ### 5. Collaboration and Open Innovation
- Partnerships: Collaborate with academic institutions, industry partners, and other stakeholders to stay at the forefront of AI research and innovation.
 - Open-Source Contributions: Consider contributing to and leveraging open-source AI projects to foster innovation and collaboration within the community.

Continuous Monitoring and Improvement

Continuous monitoring and improvement are essential for ensuring the effectiveness and ethical use of generative AI in filmmaking. This chapter emphasizes the importance of regular performance and ethical audits to maintain high standards and fairness. It highlights the need for robust user feedback mechanisms to drive responsive updates and improvements. Providing comprehensive training and technical support ensures users can effectively utilize AI tools. Staying informed about emerging trends and designing adaptable AI systems are crucial for incorporating the latest advancements. Additionally, ongoing assessment of long-term impacts and engaging stakeholders are vital for aligning AI implementation with societal values and industry standards.

1. Regular Audits and Reviews

- Performance Audits: Conduct regular performance audits to ensure that AI systems continue to meet the desired standards and deliver accurate results.
- Ethical Audits: Periodically review AI systems for ethical compliance, including bias detection and mitigation, data privacy, and fairness.

2. User Feedback Integration

- Feedback Mechanisms: Establish mechanisms for users to provide ongoing feedback on AI tools. This can include surveys, user forums, and direct support channels.
- Responsive Updates: Use the feedback to make continuous improvements to the AI tools, addressing any issues or enhancing functionalities based on user experiences.

3. Training and Support

- User Training: Provide comprehensive training materials and resources to help users understand and effectively utilize AI tools. This can include tutorials, webinars, and documentation.
- Technical Support: Offer robust technical support to assist users with any issues they encounter, ensuring they can fully leverage the capabilities of the AI tools.

4. Adaptation to Emerging Trends

- Stay Informed: Keep abreast of the latest developments in AI and related fields to continuously incorporate cutting-edge advancements into the tools.
- Flexibility and Adaptability: Design AI systems to be flexible and adaptable, allowing for easy updates and modifications as new technologies and methodologies emerge.

5. Ethical Considerations

- Long-Term Impact: Regularly assess the long-term impact of AI tools on the filmmaking industry and society. This includes monitoring for unintended consequences and making adjustments as needed.
- Stakeholder Engagement: Maintain an ongoing dialogue with all stakeholders to ensure that the implementation of AI aligns with broader societal values and industry standards.



By adhering to these practical recommendations, digital tool providers can ensure that generative AI technologies are developed and implemented in a responsible and ethical manner. These guidelines will help maximize the benefits of AI while minimizing potential risks, ultimately contributing to a more innovative, inclusive, and sustainable filmmaking industry.