



AI unplugged: the perspective of the live performance sector

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Introduction

This paper aims at providing an overview of selected topics related to the current and future use of artificial intelligence and its implications for the live performance sector from the perspective of the European social partners.

The AI systems are understood in this paper in line with the definition adopted by the OECD (and revised in 2023). It defines an AI system as a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments. Different AI systems vary in their levels of autonomy and adaptiveness after deployment¹.

While AI systems have been used in different applications for several years (e.g. internet search, OCR – optical character recognition), the last few years brought an advent of an AI boom helped by the progress made in large language models that exhibited human-like traits of knowledge and creativity. Of particular interest is so-called generative artificial intelligence, that can generate outputs such as text, images, videos, sound or other data often in response to prompts. This is facilitated by underlying models learning the patterns and structure of their input training data, which can then be transformed to generate new data with specific characteristics².

The current AI boom is reflected in massive investment in companies at the forefront of AI research and underlying infrastructure, fast development and somewhat more gradual adoption of AI-based tools in variety of contexts, interest in and attempts to develop regulatory systems in different jurisdictions and intensive public debate engaging researchers, policymakers, social partners and other stakeholders on opportunities and challenges related to wider and wider adoption of AI tools.

The breadth of the topic and fast-paced changes in this area imply that this paper needs to set itself realistic ambitions. It does not attempt to provide an all-encompassing analysis of the expected impact of AI on the live performance sectors and its social partners. It rather aims to highlight some of the key trends that are relevant, formulate questions or hypotheses that may help social partners in their continued work on the topic and propose certain recommendations.

As with several technologies in the past, AI future impact remains uncertain. The decision to devote one of the research papers under the project 'Strengthening capacities in the live performance sector' was taken by the participating employers organisations and trade unions that voted on a selection of possible topics in a

¹ OECD (2024), "Explanatory memorandum on the updated OECD definition of an AI system", OECD Artificial Intelligence Papers, No. 8, OECD Publishing, Paris, <https://doi.org/10.1787/623da898-en>.

² As an illustration, the picture on the cover page of this paper was generated by an AI tool monica.im using the following prompt: "Take Edgar Degas' painting *Orchestra at the Opera* and modify it slightly showing AI applications in music performance." Given the outcome, it remains uncertain whether the original Degas' painting from 1870 was part of the training data for the model used to create the picture. It is, however, clear that the model can well interpret wording referring to an opera concert and also to popular presentations of AI-based applications.

survey in the beginning of 2024. AI topics received the largest number of votes of social partners. This level of interest is encouraging as one of the main lessons stemming from this paper is that social partners in Europe's live performance sector are well advised to actively follow AI developments as these technologies could significantly impact how performances are created, managed, and monetised, and proactive engagement of social partners can help protect artists' rights and ensure fair practices in an evolving industry.

A selective snapshot of AI uses in the sector

This section provides examples of AI applications in the live performance sector. The examples certainly do not cover all interesting applications that likely emerge with increasing capabilities of AI solutions and creativity of performers.

AI tools were invited to co-create theatre plays in part to ask questions on associated risks. One such attempt is *AI*, directed by Jennifer Tang at the London's Young Vic theatre. The play had its premiere in August 2021³. The play's main hero is GPT-3. In front of the audience it is given a prompt, like "write me a play about artificial intelligence," GPT-3 spits out pages of human-sounding text. But later it turns out that the technology has serious flaws that cannot be looked over. The director observed that "the technology would reliably cast one of their Middle Eastern actors in stereotypical roles: as a terrorist, as a rapist — or as a man with a backpack full of explosives." This poses a huge concern of how can the theatre-makers prevent a piece of technology/tool from creating more harm when they're not the creators of the technology?

Another interesting theatrical experiment is Annie Dorsen's 'Prometheus Firebringer', a 2023 play at the Theatre for a New Audience space in Brooklyn⁴. It is a variation combining an AI-generated versions of the lost Aeschylus's *Prometheus Firebringer* based on the scholarly texts on its likely content. Combining also AI-generated theatre masks, and AI-generated computer voices the play features the director giving a talk built from quotes from various texts that triggers the audience to think about the relationship between technology and power. She concludes "Artists need to think seriously about how these models work, what they do, and what they mean for the future of both making and experiencing art".

In 2021, a co-operation between the Faculty of Mathematics and Physics of the Charles University in Prague and Švanda Theatre and DAMU created a theatre play, 90% of which was written by the language model GPT-2 from OpenAI. Human co-writers only provided an introductory scene. The play includes eight scenes describing a robot's journey in the human world and it's a mixture of black comedy and existential drama⁵.

³ See <https://www.youngvic.org/whats-on/ai>

⁴ See <https://culturesauce.com/2023/09/19/prometheus-firebringer-review-annie-dorsen/>

⁵ See <https://www.czechuniversities.com/article/the-first-theatre-play-written-by-ai>

Experiments related to engaging AI in production of musical performances include attempts described by journalists at BroadwayWorld of the results of prompting ChatGPT to produce a musical for Broadway⁶. The 2023 article pointed to several problems with the quality of resulting work including a production that appeared to be close to a plagiarized version of a movie. Another experiment run by a production company and published on their website in May 2024 concluded with a statement: "for better, or worse, AI can create musicals. It's up to us to spy on our digital competition, and do better than it can" ⁷.

Experiments with music improvisation in live concerts involving AI tools are implemented by several artists, including Iván Paz. "If your algorithm is acting at a really low level, then you feel like playing an instrument, because you are actually tweaking, for example, the synthesis parameters," Paz said. "But if the algorithm is defining the form of the musical piece, then it's like playing with an agent that is defining what is going to happen next."⁸

Experiments with algorithms have for a long time been part of the dance scene. Already in 1995, Merce Cunningham, a choreographer worked with a programme to manipulate avatars on a screen. The intention was to grasp dancers' natural habits, analyse them and try to create something new.⁹ AI tools are often used to explore the complexity and limitations of the human body. AI applications are also applied to integrate audience in the performance. In October 2024, the AΦE has launched an AI-driven dance production where the main hero is an AI entity, who has co-created the work jointly with two humans. During the performance the AI hero appears on a LED cube that can be moved by the audience. Moving of the cube triggers dance movements of the AI dancer.

Artists mostly agree that interacting with AI is not about trying to replace human body but more about integrating it in performances and using the ensuing opportunities. In choreography, at present purely AI-generated moves tend to seem rather superficial, so the clue lies in wisely integrating it with the artistic expression of the human body.

Other examples of applications are security solutions applied during Taylor Swift concerts from the Reputation Stadium Tour, where facial recognition technology was deployed to spot stalkers¹⁰.

Finally, it can be taken for granted that many performing artists, teams supporting them, or social partner organisations in the sector adopt a range of AI-powered tools to improve various aspects of their work be it automatic translation between

⁶ See <https://www.broadwayworld.com/article/Could-AI-Written-Musicals-Ever-Come-To-Broadway-20230124>

⁷ See <https://nmi.org/can-ai-write-a-musical/>

⁸ See <https://www.vox.com/the-highlight/358201/how-does-ai-music-work-benefits-creativity-production-spotify>; <https://revista.unaminternacional.unam.mx/en/nota/6/musica-e-inteligencia-artificial-nuevas-posibilidades-creativas>

⁹ See <https://www.theguardian.com/stage/2024/oct/29/small-step-or-a-giant-leap-what-ai-means-for-the-dance-world>

¹⁰ See https://medium.com/@jeyadev_needhi/the-ai-revolution-in-music-concerts-how-famous-singers-are-using-technology-to-transform-d2105bd74dc4.

languages, automatically creating podcasts about topics of interest, analysing social media reactions to live performances and many more.

Observations on the regulatory landscape

Reflecting the recency and rapid pace of changes in the area, the regulatory landscape is constantly evolving and remains highly complex. This paper does not attempt to provide a comprehensive assessment. Instead, it shares a few observations of a more general nature than can help understand the drivers of regulatory action and existing trade-offs. More attention is devoted to the EU AI Act, given its recency (it entered into force in August 2024) and global novelty in terms of a comprehensive attempt to regulate AI.

Given the global impact of developments related to AI, it is not surprising that international efforts started already several years ago to agree on certain principles that should guide the emerging regulatory framework. Following a period of discussion that started in late 2010s, in 2019 the OECD and G20 group of countries adopted the AI Principles, the first intergovernmental standards on AI. The principles were updated in May 2024, and they remain the main reference point for regulatory approaches in key global jurisdictions.

The OECD Principles are as follows¹¹:

- Inclusive growth, sustainable development and well-being
- Respect for the rule of law, human rights and democratic values, including fairness and privacy
- Transparency and explainability
- Robustness, security and safety
- Accountability.

Several elements explicitly mentioned under these general headings can be of particular interest to social partners in the sector. The Principles' recitals underline the necessity of a *well-informed whole-of-society public debate (...) for capturing the beneficial potential of the technology, while limiting the risks associated with it*. They further observe that *existing national and international legal, regulatory and policy frameworks already have relevance to AI, including those related to (...) personal data protection, intellectual property rights, responsible business conduct*. Under the transparency and explainability principle, there is a call for AI actors to provide meaningful information *to make stakeholders aware of their interactions with AI systems and where feasible and useful, to provide plain and easy-to-understand information on the sources of data/input*. Under accountability principle there is a call that *AI actors, should (...) apply a systematic risk management approach (...) and adopt responsible business conduct to address risks related to AI systems*,

¹¹ OECD (2024), Revised Recommendation of the Council on Artificial Intelligence, C/MIN(2024)16/FINAL, 3 May 2024, <https://www.oecd.org/en/topics/sub-issues/ai-principles.html>

including (...) those related to (...) privacy, as well as labour and intellectual property rights.

The general principles appear to gather wide support globally, not only among OECD countries, but also e.g. among G20 countries, including China and India that endorsed the Guidelines in June 2019. The references to the principles consistently appear also in more recent G20 declarations¹². At the same time, there remains many open questions on the optimal practical approaches that can be adopted to regulate the AI. This was well summarised in the title of the article by The Economist from October 2023: *The world wants to regulate AI, but does not quite know how*¹³.

In broad and simplified terms, the challenges are as follows. First, given the global character of AI systems, there remains a strong case for international actions. Tightening certain rules in some jurisdictions is of little use if the same does not happen elsewhere. Second, certain degree of regulatory competition takes place with countries and blocks of countries such as the EU interested to de facto set global regulatory standards for AI that other jurisdictions would then be likely to follow. Third, there remain trade-offs between stimulating innovation in the area and introducing regulatory checks, which may ban or increase costs of certain actions. Interestingly, the leading AI companies in the OECD world appear to support the emergence of certain regulatory framework, fearing that without it, a race to the bottom could ensue leading e.g. to release of the models that can be misused and cause harm. Still, a consensus is lacking on key risks that the regulation should try to address, what the regulation should target (e.g. models vs. their applications) and how the regulation could be enforced.

The approaches to the AI rule making can be presented along different dimensions:

- the extent to which they rely on legislation and regulation
- the extent to which they rely on guidelines
- the extent to which the regulation or guidelines are sector-specific vs. across all sectors.

The EY analysis from late 2023 classified the EU and to somewhat lesser extent Canada and China as places relying stronger on legislation and regulations, compared to the US, UK, Japan or Korea. EU, US and Japan were places where guidelines were more popular than in the UK. China or Canada¹⁴.

A common element of the approaches in most jurisdiction is linking rulemaking to risks posed by AI. This entails adapting regulations to the risks posed by specific AI-

¹² See e.g. One Earth, One Family, One Future. G20 New Delhi Leaders' Declaration, New Delhi, India, 9-10 September 2023. <https://www.consilium.europa.eu/media/66739/g20-new-delhi-leaders-declaration.pdf>

¹³ The Economist, The world wants to regulate AI, but does not quite know how, 24 October 2023. In the printed edition the article title was *Of evils and evals*.

¹⁴ EY (2023), The Artificial Intelligence (AI) global regulatory landscape Policy trends and considerations to build confidence in AI.

related activities. In this way, regulators hope to strike a balance between mitigating risks while still encouraging development and use of AI¹⁵.

In August 2024 the EU's Artificial Intelligence Act entered into force, following several years of legislative work and negotiations¹⁶. It is currently seen as the most comprehensive binding regulatory attempt globally that covers several aspects of AI systems. Given this uniqueness and novelty, the Act's application in Europe, and the strong interest of the social partners from the live performance sector (see section below), it is worthwhile to devote a few paragraphs to this legislation¹⁷.

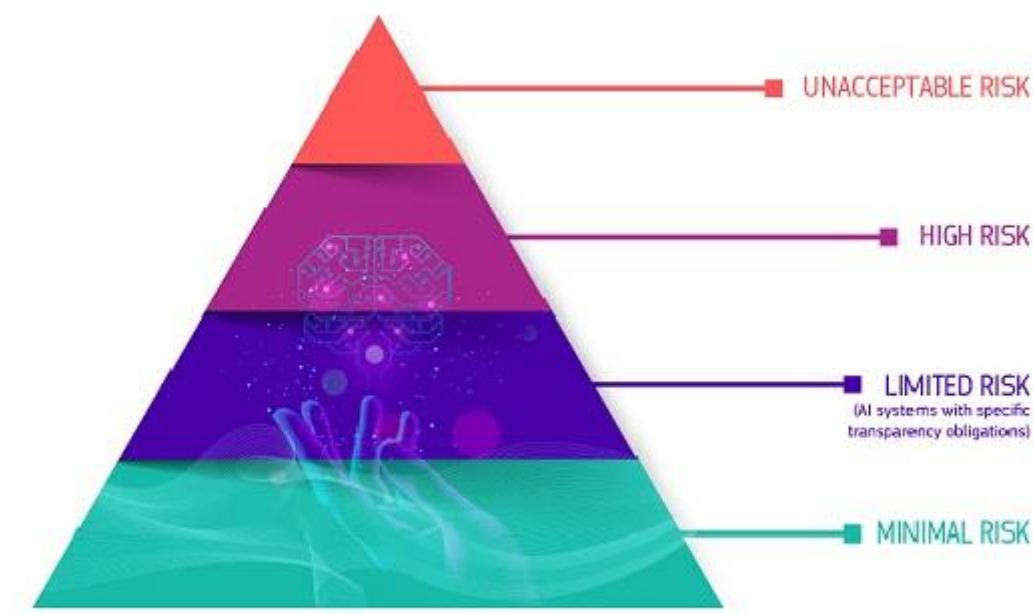
In line with the dominant trend discussed above, the AI Act adopts a risk-based approach, where AI systems are classified into several risk categories, and applicable regulation depends on this risk (Figure 1). AI systems falling into unacceptable risk category are banned. Examples include exploiting vulnerabilities due to age, disability, or social or economic situations, causing significant harm or biometric categorisation systems inferring race, political opinions, trade union membership, etc. or AI systems creating or expanding facial recognition databases through untargeted scraping from the internet or CCTV footage.

¹⁵ For further discussion see e.g. EU (2023), The Artificial Intelligence (AI) global regulatory landscape Policy trends and considerations to build confidence in AI.

¹⁶ Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act); [Regulation - EU - 2024/1689 - EN - EUR-Lex \(europa.eu\)](#).

¹⁷ This short overview draws inter alia from Madiega T. (2024), Artificial intelligence act, Briefing Members' Research Service PE 698.792, [https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI\(2021\)698792](https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI(2021)698792) and European Commission's materials available at <https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai> and information provided by the <https://artificialintelligenceact.eu/> website.

Figure 1. Four levels of risk defined in the EU AI Act



Source: extracted from <https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai>

Strict rules will apply to AI systems classified as high risk. Before such products can enter the market, they will require setting adequate risk assessment and mitigation systems. The database feeding them will need to be of high quality, there are requirement on traceability of results and on ensuring that authorities can access detailed documentation. Examples of systems in this category that may be of interest to social partners include AI technologies used in employment relations such as CV-sorting software for recruitment procedures, digital casting tools or technologies used in the area of educational or vocational training, that may determine the access to education and professional outcomes (e.g. scoring of exams).

As regards limited risk systems, an important element introduced by the AI Act are specific transparency requirements for certain AI applications, for example where there is a clear risk of manipulation (e.g. via the use of chatbots) or deep fakes. The objective is to make users aware that they are interacting with a machine. AI systems falling under minimal risk category can be developed and used without additional legal obligations of the AI Act.

Of particular interest to the sector's stakeholders are provisions related to generative AI. The regulation introduces a concept of general-purpose AI models (GPAI) i.e. ones that displays significant generality and can competently perform a wide range of distinct tasks. This includes popular generative AI models, such as DALL-E, or ChatGPT. Importantly, all providers of GPAI models, including of the models that are free and open license are obliged to:

- put in place a policy to comply with Union law on copyright and related rights, and in particular to identify and comply with, including through state-of-

the-art technologies, a reservation of rights expressed pursuant to Article 4(3) of Directive on Copyright in the Digital Single Market (2019/790);

- draw up and make publicly available a sufficiently detailed summary about the content used for training of the general-purpose AI model¹⁸.

The rules on GPAI will enter into force in August 2025, one year earlier than full entry into force of the AI Act.

Transparency obligations are also likely highly relevant for the live performance sector. In particular Article 50 of the AI Act require that deployers of an AI system that generates or manipulates image, audio or video content constituting a deep fake, shall disclose that the content has been artificially generated or manipulated.

The vivid public and political debate on the regulations and their implementation have continued. This includes aspects related to text and data mining activities. In broad terms, the high-level tension exists between safeguarding interests of content right holders (such as e.g. sound, video and other recordings of live performers) and an objective of ensuring favourable conditions for advancement of AI systems, also taking into account global character of the AI market with different approaches to copyrights across jurisdictions¹⁹.

Of particular interest to social partners is the on-going debate between the EU Member States' governments in the Council's Working Party on Intellectual Property (Copyright). A questionnaire published by the Council Presidency at the end of June 2024 is certainly worth analysing²⁰. This document is an invitation to a policy dialogue and for sharing of information, that can potentially lead to future legislative actions, including in areas not currently covered by the law at the EU level. Examples of the topics covered, and specific questions asked include the following ones²¹:

- Training of AI models

Directive on Copyright in the Digital Single Market establishes an opt-out system for the general text and data mining exception (Article 4), allowing rightsholders to object to the use of their works or other subject matter protected by copyright and related rights. The AI Act confirms the applicability of the text and data mining exception, including the possibility of the opt-out in the context of AI training. However, some views suggest that this training process cannot always be classified under the right of reproduction, for which such an opt-out can be invoked. There are still open questions regarding the exercise of the opt-out, for

¹⁸ Article 53 of the AI Act.

¹⁹ For an example of a recent academic paper analysing the issue of exceptions for text and data mining in the context of AI development and legislative process of the AI Act, see Gina Maria Ziaja, The text and data mining opt-out in Article 4(3) CDSMD: Adequate veto right for rightsholders or a suffocating blanket for European artificial intelligence innovations?, *Journal of Intellectual Property Law & Practice*, Volume 19, Issue 5, May 2024, Pages 453–459, <https://doi.org/10.1093/jiplp/jpae025>.

²⁰ Presidency, Policy questionnaire on the relationship between generative Artificial Intelligence and copyright and related rights, 27 June 2024, [https://www.consilium.europa.eu/en/meetings/mpo/2024/7/int-property-copyright-\(345646\)/](https://www.consilium.europa.eu/en/meetings/mpo/2024/7/int-property-copyright-(345646)/)

²¹ To make it easier to follow the tone and views of the Council discussions on the subject, the bullets below directly quote (with adaptations) from the policy questionnaire.

instance, in relation to the issue of who has the right to make a valid reservation, what the realistic scope of a valid reservation can be and what the agreeable technical requirements for a reservation by right holders should be.

- Transparency

Performers might be significantly affected by the use of AI generated content due to their personality rights (the use of their voice or their entire likeness can be the outcome of the use of such tools.) When considering a possible additional labelling obligations beyond the ones currently covered in the AI Act, is it necessary to differentiate between various types of works and other subject matter (e.g., audio, visual, audiovisual or textual content) from a watermarking/labelling perspective? Are there specific areas where such labelling (e.g., in the case of performances) would be more justified from a copyright perspective?

- Remuneration

The process of creation using generative AI may involve the use of works in the training dataset, and the resulting content can compete in the same market as copyrighted works and performances. This phenomenon can, in some cases, negatively impact the legitimate economic interests of authors and other related rightholders. To avoid such negative impacts, rightholders may opt-out of the text and data mining exception. However, from a practical and legal perspective, the case of material already used for training before the opt-out took place might also be considered, since in general it seems unclear how it can be extracted and removed from the AI training dataset. The copyright-relevant uses carried out by current market-leading AI providers do not, possibly to a major extent, take place in the EU. What measures could be taken at EU level to facilitate the conclusion of licenses between right holders and AI developers? Is there a justified reason to introduce any kind of a specific remuneration regime (possibly in relation to specific sectors or aspects of the generative AI creating process) in the context of generative AI activities?

Sectoral social partners' positions on AI

During the last two years social partners in the sector and especially trade union organisations adopted position papers or issued statements related to the progress in the AI tools and its implications for the sectors and especially its workers.

This note analysed in more detail four such statements, three issued during 2023 by the French and UK partners and a more recent one signed by several organisations:

- Declaration of artists of the French Syndicat français des artistes interprètes (French Union of Performing Artists) from May 2023
- Position Paper on Artificial Intelligence by UK Music from June 2023

- AI Vision Statement by Equity, the UK performing arts and entertainment trade union from June 2023, and
- Authors', performers' and other creative workers' organisations joint statement on generative artificial intelligence and the EU AI Act from April 2024

A common theme across these documents is the strong call for protecting creators' rights in the face of AI's rapid advancements, especially generative AI. The artist associations emphasize the need for clear consent mechanisms, fair remuneration and transparency where copyright protected works are used as inputs by generative AI. Another shared concern relates to the potential misuse of likenesses, voices, and performances, as seen in Equity's focus on performance cloning and Syndicat français des artistes interprètes' emphasis on synthetic voices. The protection of this biometric data should fall within the framework of the GDPR, but this is not effectively deployed. The scraping of such data impacts on the livelihood of performers but places all people at risk of deep fakes. The call for legal frameworks to protect creators is a recurring theme, with all parties calling for updated regulations that reflect the way in which AI changes the use of artistic creation and more broadly AI's growing role in creative industries. The advocacy for transparency in data usage, as well as clear labelling of AI-generated content, is central to these discussions, ensuring that human creativity is not diminished by technology.

While the emphasis of the documents is on risks and associated calls for action, it is clear that the sector is also aware of the positive potential of AI systems. For instance, the UK Music Policy Position Paper emphasizes the potential benefits AI brings to the music industry, such as enhanced fan engagement and streamlined administrative processes.

The 2024 joint statement from creative workers' organizations, including UNI MEI - UNI - Media, Entertainment and Arts, International Federation of Actors, and International Federation of Musicians focuses on the strengths and weaknesses of the solutions that were incorporated in the EU's AI Act and other relevant legislation. The AI Act was in a draft stage when the statement was issued. The document makes a strong legal argument that the AI Act may not be considered as extending the scope of copyright and related laws exception for text and data mining as defined in the Directive (EU) 2019/790 on copyright and related rights in the Digital Single Market to the use in training AI models. At the same time the statement makes the point that nonetheless works and personal data of creators have been used on a massive scale by the AI industry without any possibility for creators to reserve their rights and be remunerated in return. Hence, while calling for an effective implementation of the AI Act, the statement also urges further work to address legal ambiguities and enshrine transparency, informed consent and remuneration into the legal framework.

Opportunities

This section highlights some of the opportunities that the AI can bring to the live performance sector. As with any new technology, the exact pace of AI

implementation and the nature of its impact remain uncertain. Therefore, this list should be viewed not as a definitive catalogue, but as an open invitation for further exploration and innovation within the sector.

AI tools offer opportunities to introduce new features to and expand the creative boundaries of live performances. For example, AI can be used to generate novel lighting designs, stage effects, or choreographic suggestions based on audience reactions. As an illustration, AI-powered music composition tools could assist composers and sound designers in crafting complex musical scores tailored to specific emotional cues from the audience. Additionally, AI can create interactive, immersive experiences where digital elements immediately respond to the actions of performers. This could allow artists to experiment with different forms of storytelling, blending human creativity with AI-generated content to produce performances²².

From an employer perspective, there may be a potential to increase productivity within the live performance sector by supplementing human performers with AI-driven avatars or digital characters. Productivity is understood here in economic terms, as a value of production (e.g. as a sum of the value of tickets sold) per performer. Taking live music as an example, and taking a longer historical perspective one can observe that in 18th century, the technological evolution of musical instruments and in particular the introduction of piano had profound impact on live performances. Much louder sound made it possible to perform in front of substantially larger audiences²³. This was hence a large boost to productivity of performers: during one set they could offer their music to a concert hall with a large audience, something that was not possible with a clavichord (it was too quiet to be heard from more than a few metres away), whereas harpsichord could not produce subtle gradations of volume. For the following two and a half centuries, further changes took place in the sector. The invention of radio and possibility to record and play music (e.g. CD and more recently on-line) were major changes affecting the opportunities of musicians. Still, as regards live performances, the situation has not changed that dramatically since Mozart's times, even if technological progress meant better (and larger) concert halls. One still requires a symphony orchestra gathered for a set period of time in one place to fully experience Beethoven's 5th symphony live.

It is not yet clear exactly how, or indeed how quickly, it might become feasible for AI technology to offer workable alternatives for certain production elements and even cost-savings. We might imagine scenarios where for example, AI elements, interacting with live performers, could reduce the need for large cast sizes or expensive set designs (or offer backup solutions e.g. in case of an illness of a team member). For example, an AI avatar could serve as a "virtual co-performer," interacting with actors or musicians on stage, enhancing the visual and narrative complexity of the performance. This may help contain rising costs of live

²² One example of a project aimed at enhancing music live performance is provided by NextBeat.AI by Gniewomir Tomczyk, Polish composer and drummer and Robert Szczytowiec, sound engineer. See <https://gniewomirtomczyk.pl/nextbeat-ai/>.

²³ Baumol, W. J. and H. Baumol (1994), On the Economics of Musical Composition in Mozart's Vienna, *Journal of Cultural Economics* 18: 171-198.

performance, making them affordable to a wider audience²⁴. By enhancing production efficiency, AI could expand access to live performances, opening the door for broader participation in arts and culture.

In the more immediate and readily predictable future, there is potential for AI to indirectly support demand for live performances through at least two channels. First, if AI leads to economy-wide productivity gains, disposable incomes could rise, enabling more people to afford and attend live performances. Second, as AI and virtual interactions become more prevalent in everyday life, people may develop a greater appreciation for live, in-person experiences. The contrast between virtual and real-life encounters could boost demand for authentic human interaction, as the emotional resonance of a performance cannot be replicated by technology.

If the AI tools end up leading to substantial improvements in venue and audience planning systems and sound and light uses, this can also have wider implications. Specifically, this can help optimise costs and improve reach to intended audience. AI can also help to reach specific audience groups and enhance inclusion. It can increase satisfaction about the work content as it allows to free up time allowing to focus on other (more rewarding) aspects of the job.

From the perspective of social partners organisations there is also potential to enhance the productivity and effectiveness of their work. This can relate to streamlining office tasks and reducing some administrative burdens and hence freeing up staff time for more strategic activities. Additionally, AI-powered data analysis tools can facilitate the review and interpretation of legislative and regulatory proposals, enabling stakeholders to engage in a more impactful way in discussions on and shaping of policy and regulatory framework that impact on the sector. AI can also help overcome language barriers, making international collaboration between social partners easier and more effective, ultimately fostering a more cohesive and responsive global network of industry professionals.

Risks

One of key risks of AI in the live performance sector is its potential impact on performers' income from copyright-protected works. As AI-generated content grows, performers might see a decline in royalties and licensing fees that traditionally come from their work. This could result in reduced financial security for artists whose revenue depends heavily on the protection of intellectual property rights.

As often happens with technological changes, AI is likely to lead to shifts in labour demand. Demand for some roles can be expected to decline. This can for example affect certain jobs that performers undertake outside of live performances, such as

²⁴ Again, the point is not that past large-scale implementations of existing AI tools have necessarily lowered the costs. For example, it took seven years and GBP 175 million to develop the technology and build the arena in east London for concerts of avatars of the Abba rock band that now perform concerts with tickets that in November 2024 ranged from 77 to 159 GBP. The point is rather that particularly fast decline of prices of new technologies is likely to considerably change the economics of AI-supported live performances.

dubbing, voice recording, and acting for video games. Generative AI, which can replicate human voices and performances, poses a direct threat to these professions. Furthermore, these synthetic performances pose the risk of devaluing human creative work. Additionally, people in certain technical jobs related to live performances, such as sound or lighting design, may require retraining or gaining additional skills. This may put pressure on human professionals in these fields and can reduce certain employment opportunities. The history of past technological transition suggests that this risk will likely be counterbalanced by rising demand for some other roles²⁵. Still, the transition can be difficult for groups of workers lowering their real wages as also evidenced by historical evidence²⁶. A related risk applies to certain skills in the sector. Shifting demand for skills will likely imply that specific skills will become less often needed and hence may become scarcer with ensuing implications for the whole sector.

The manipulation of performers' likenesses through deepfakes creates serious risks. The AI-generated images, videos, or audio clips can misrepresent artists in damaging ways. Performers, especially those who record audio or video content, are particularly vulnerable due to the easy access to the data that can be misused. The misuse of likeness or voice can harm performers' reputation and directly impact their employment opportunities and income.

Another potential issue with widening of the use of AI-based solutions is homogenization of audience preferences. Increased exposure to AI production that is tailored to needs and that draws from existing patterns in algorithmic ways may ultimately diminish the diversity and richness of cultural expressions. Over time, this could lead to a narrowing variety of artistic tastes, reducing the audience's openness to more experimental or unique live performances. Such a shift could result in the devaluation of live cultural experiences, as audiences may begin to prefer easily accessible, AI-generated content over the authenticity of human performances.

While the historical evidence shows that technological advancements like radio, television, and Internet streaming have not reduced the demand for live performances, there remains uncertainty about how increasingly easier access to AI-generated content might influence future audience behaviour. If AI becomes better at replicating or simulating live performances, there is a potential risk that audiences could become less interested in attending live events.

Finally, a risk that is not strictly linked to applications in the live performance sector, but a broader issue with AI relates to energy intensity of the underlying technology.

²⁵ Examples often cited in literature include an increase the shifts in bank employment following popularisation of cash dispensers (ATMs), where employment increased due to rise in the number of branches and higher employment of people focusing on customer relations (see e.g. <https://futuresofwork.co.uk/2022/11/29/technologys-impact-on-the-labour-market-different-this-time/>).

²⁶ One example is the fate of previously well paid artisan cotton weavers during the early years of the industrial revolution (1800s and 1810s) after their jobs were largely replaced by newly invented machines (see e.g. Acemoglu, D. and S. Johnson (2024), Learning from Ricardo and Thompson: Machinery and Labor in the Early Industrial Revolution, and in the Age of AI, NBER Working Paper 32416.).

As environmental concerns intensify, the energy-intensive nature of AI raises serious questions about the sustainability of its widespread adoption, including in the live performance industry.

Conclusions and recommendations

One area that has always been important for the sector is the evolution of audience preferences. Education, access to technologies, most recently including AI tools, and other socio-economic developments all play a role here. While it remains uncertain how exactly the advances in AI will shape the audience in the future, the sector clearly has a role to play in reaching out to new potential spectators, including in groups that have historically been less represented in concert, theatre and other venues. There is also room for cross-sectoral initiatives, given the live performance potential to foster emotional and social connections in the societies.

The AI-enabled technologies and tools are here to stay. Their potential to reshape the live performance sector is significant, though its full extent remains unclear. Experiments with AI are happening across all areas of the live performance business. The technology's ongoing development presents both risks and opportunities for performers, social partners, and other stakeholders. It is thus crucial for social partners to stay informed and actively engage in public debate on regulatory and technological developments. This will require investing adequate resources in acquiring and updating the knowledge base and skills in this rapidly changing area. Still, this appears the best way for the social partners to remain highly relevant for the sector's stakeholders and to be able to protect the interests of workers and employers. The impact of AI on the sector can be significant, and those who remain proactive will be better positioned to navigate this rapidly evolving landscape.

Given the complexity of AI-related developments, it is essential for social partners to collaborate and share resources. By pooling knowledge and expertise, stakeholders gain better chances to remain abreast of developments and to better understand emerging risks and opportunities. Cooperation would also strengthen social partners' ability to effectively represent the sector's needs in negotiations and policy discussions.

Engaging with governments, research centres, big tech companies, and audiences is crucial for shaping the future of AI's role in live performance. It is important to realise that other players, such as governments are open to constructive dialogue and advice, themselves feeling pressure to maximise opportunities and limit the risks related to the new technology. Ongoing policy debates, such as those surrounding the EU's AI Act, and the example of Council's Working Party on Intellectual Property (Copyright) questionnaire discussed earlier in this report provide good examples. There appears to be room for and interest in well-argued, realistic proposals of social partners. The dialogue with governments and other stakeholders may make it possible to develop and adopt new solutions.

Copyright issues as well as personal and biometric data protection are clearly one of the key areas of focus for the sector. The way in which AI-generated content uses

existing performances and the output of generative AI tools challenge traditional notions of intellectual property. Carefully considering the nuances and trade-offs in this area will be key for social partners to develop practical and constructive proposals that can balance the protection of performers' rights with technological innovation. Solutions that are well thought-out and realistic are more likely to gain traction in policy circles and be implemented effectively.

Lastly, the opportunities presented by AI should not be overlooked. Social partners can harness new tools to improve the way they operate as organisations, from enhancing internal workflows to fostering effective engagement with stakeholders and easier co-operating across borders. The fusion of artistic creativity with advanced technology opens new possibilities for live performances. This intersection could lead to groundbreaking experiences and exciting artistic explorations and may allow the sector to evolve in dynamic ways, while preserving the unique value of human expression.