Journal of Music Theory and Transcultural Music Studies, 2(2), 143-158, December 2024
e-ISSN: 3023-7335
jmttms.com

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Research Article

The role of AI in creative processes: ethical and legal perspectives in the music industry

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Article Info

Received: 9 October 2024
Accepted: 28 December 2024
Online: 30 December 2024

Keywords
Artificial Intelligence
Creative processes
Ethical and legal frameworks
Human-AI collaboration
Music

Abstract

The research illuminates the dual nature of AI as both a catalyst for enhanced creativity and a potential threat to human artistry. The methodological approach employs qualitative research techniques, combining literature reviews with industry professionals actively engaged in music creation. This approach facilitates a grounded understanding of AI implementation and its implications for various stakeholders across the musical ecosystem. The findings reveal several significant dimensions of AI's impact on musical creation. First, AI technologies are increasingly integrated across the music industry value chain, from composition to distribution, with machine learning algorithms serving as the foundational technical infrastructure. Second, the historical development of AI in music spans approximately 70 years, evolving from basic algorithmic compositions to sophisticated neural network applications. Third, the research identifies tensions between corporate interests and creative empowerment, highlighting how profit-driven motivations may undermine artistic integrity and economic sustainability for human creators. The study further articulates critical ethical and legal considerations, particularly regarding copyright attribution, fair compensation, and the preservation of authentic human expression. The analysis demonstrates how existing legal frameworks are inadequate for addressing AI-generated creative content, necessitating new regulatory approaches that balance technological innovation with artistic protection. The conclusions emphasize the importance of establishing balanced frameworks that harness AI's creative potential while safeguarding human artistic expression. The research advocates for proactive, multifaceted approaches including transparent ethical guidelines, comprehensive legal frameworks protecting artists' rights, and collaborative models that leverage the complementary strengths of human and artificial creativity. This study contributes valuable insights into navigating the transformative impact of AI on music creation while preserving the essential human elements that make music a meaningful artistic expression.

To cite this article

Canyakan, S. (2024). The role of AI in creative processes: ethical and legal perspectives in the music industry. *Journal of Music Theory and Transcultural Music Studies, 2*(2), 143-158. DOI: https://doi.org/10.5281/zenodo.15031855

Introduction

In summary, the use of Artificial Intelligence (AI) in the music industry is progressing quickly. Start-ups and digital companies are offering a variety of services for music production, playlist curation, promotions, and engaging with consumers through machine learning algorithms, forecasting analysis, and automatic genre classification. AI algorithms can create new music based on data from streaming services and user behavior, providing access to new music for music lovers everywhere. Some technologically advanced start-ups are also exploring AI-driven music generation, lyricism,

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melody creation, and composition, possibly involving self-improving machines in the creative process. AI algorithms can also predict music tastes and generate music content using non-recognizable voice synthesis.

With these achievements, several questions emerge in relation to the ethical propriety of AI creative outputs, user acceptance, and copyright protection rules. Moreover, copyright law and regulations of the music industry were not designed to cope with fast technological advancements and the connected unasked machine-driven creative content. In this sense, this essay aims to discuss some legal responses that have been developed in relation to AI-generated music outputs. More precisely, this work will focus on the remuneration right scheme in regard to the creative inputs made by the AI composer, as well as the application of the 'originality' principle towards AI-generated music. The discussion will also cover whether it can be legally and technically implemented control mechanisms for AI-driven music offers, recognized by state courts and international bodies of intellectual property as a reasonable game rule.

Artificial intelligence (AI) is fundamentally reshaping creative processes within the music industry. This study explores AI's impact on music creation and its potential to challenge human creativity. AI tools are increasingly being adopted in various aspects of the music business, from composition to distribution, yet their ethical and legal implications remain a topic of debate (Hodgson, 2021; Detweiler et al., 2022). The study not only seeks to answer these ethical concerns but also aims to establish a model that harmonizes the interests of artists, listeners, and commercial stakeholders. A central focus of the research is how music production and consumption through streaming platforms are affected by AI.

Literature Review

The intersection of artificial intelligence and musical creativity represents a complex and rapidly evolving domain that merits rigorous scholarly examination. This literature review synthesizes critical perspectives on AI's multifaceted role in transforming creative processes within the contemporary music industry, with particular attention to the ethical and legal dimensions that frame these technological interventions. The discourse begins with Assinen's (2018) foundational work addressing the pressing need for coherent copyright protection frameworks for AI-generated musical compositions. Assinen articulates how the absence of clearly defined legal parameters potentially undermines incentive structures for both artists and technology developers, thereby inhibiting innovation across the European creative landscape. This work establishes the essential groundwork for subsequent scholarly investigations concerning human agency within AI-mediated creative environments.

Building upon these legal considerations, the INSAM Journal of Contemporary Music, Art and Technology (2019) offers nuanced insights regarding the significant human contribution intrinsic to AI-assisted artistic creation. This perspective challenges reductive conceptualizations of AI as an autonomous creative agent, instead positioning human actors as deliberate curators who shape creative outcomes through dataset selection, algorithmic tuning, and output refinement. This theoretical reframing proves instrumental in addressing fundamental questions of originality and authentic creative expression in AI-mediated composition. Cetinic and She (2021) provide a comprehensive examination of AI technologies facilitating novel creative practices within music production. Their analysis suggests that while AI systems hold transformative potential for artistic processes, there remains a critical need for more sophisticated theoretical frameworks to contextualize AI-generated art. Their work implies that the continued evolution of these technologies will necessitate ongoing scholarly engagement with their implications for artistic expression and creative identity.

The concept of collaborative creation emerges prominently in Gordon et al.'s (2022) case study of Artificial.fm, a platform dedicated to AI-generated music that emphasizes co-creative approaches. This research raises significant questions regarding ownership structures and the reconfigured roles of human stakeholders within technologically mediated creative processes, reflecting broader shifts toward more inclusive conceptualizations of authorship in contemporary music production. Holzapfel (2022) extends the scholarly conversation by introducing critical ethical and environmental dimensions of Creative-AI applications. His examination of the political ecology surrounding these technologies raises important questions regarding sustainability practices and inclusivity within AI-mediated artistic

production. This research establishes crucial connections between ethical considerations and the material conditions of AI deployment in creative contexts.

In a complementary analysis, Holzapfel (2022) further investigates the social and ethical implications of AI technologies, with particular emphasis on diversity and fairness considerations. His work illuminates the environmental costs associated with AI implementation in the music industry, effectively bridging ethical discourse with practical outcomes in production environments. Crimaldi and Leonelli (2023) contribute valuable philosophical perspectives on AI's evolving role in creative expression. Their work challenges traditional understandings of creativity through an examination of how advanced AI tools increasingly generate novel artistic expressions that approximate or potentially surpass human capabilities. This philosophical inquiry invites deeper exploration of fundamental questions regarding artistic intentionality and audience reception.

Addressing technical dimensions, Noel-Hirst and Bryan-Kinns (2023) examine the challenges inherent in understanding and controlling AI-generated musical outputs. Their investigation of Explainable AI (XAI) emphasizes the importance of algorithmic transparency, particularly within artistic contexts where complex computational processes can obscure creative intent and diminish interpretive engagement. Bindi et al. (2023) conclude this scholarly discourse by addressing broader ethical challenges posed by AI technologies, including critical concerns regarding data privacy and the implications of algorithmic decision-making in creative contexts. Their research underscores the necessity for sustained dialogue concerning the ethical dimensions of AI in music, particularly as these systems increasingly influence creative production, curation, and consumption practices. This body of scholarship collectively illuminates the multifaceted relationship between AI and creativity in the music industry, revealing intricate interplays between legal, ethical, and artistic considerations that define this evolving landscape. However, significant research gaps remain regarding longitudinal impacts on creative labor markets, audience reception of AI-generated works, and the development of culturally sensitive frameworks for evaluating AI's creative contributions across diverse musical traditions. Future research would benefit from more interdisciplinary approaches that integrate technological analysis with cultural theory, economic modeling, and ethnographic methodologies to develop more comprehensive understandings of AI's transformative impact on musical creativity.

Purpose

The purpose of this study is to investigate the role of AI in music creation, focusing on its ethical and legal dimensions. The research aims to understand the opportunities AI presents in enhancing human creativity while addressing the potential economic risks for artists. The study also seeks to provide a framework for evaluating AI’s influence on music creation, ensuring that AI is used responsibly and ethically in the industry. A key question explored is whether AI will reduce the role of human artists by turning their work into data sets for future AI models, a concern that resonates across creative industries.

Method

This study employs a qualitative research methodology to explore the effects of AI on creative processes in the music industry. Given the scarcity of academic literature specifically focused on AI’s impact on the music business, the research relies on a combination of literature reviews and semi-structured interviews with industry professionals actively involved in music creation. The analysis is built upon real-world cases and experiences, providing a more grounded understanding of how AI is currently being implemented and its implications for artists, listeners, and commercial entities. This approach allows the study to critically evaluate AI’s role in music production and propose ethical and legal frameworks that can guide its responsible use.

Findings

Foundations of Artificial Intelligence in Music

The use of AI in the music sector is wider than it may seem. Over the decades, a number of AI technologies have been spotted in the music industry. These range from systems that produce music automatically to systems that help in

automatic indexing, retrieval, and extraction of information from large music databases. Others are linked to music-based services, such as listening platforms, that supply music according to a user's taste. Music recommendation is usually carried out by employing music recommendation techniques, such as collaborative filtering. Many researchers emphasize the role AI may play as a compositional tool. In our work, we identify two main lines of development, which both sparked in the last decade.

From a technical perspective, the underpinning algorithm for most AI music software is machine learning. It first learns from a large audio or notated corpus, which is derived from a large database of music pieces and compositions. Examples of functions performable using AI include music composition, such as drum generation with software. Quite a number of them are about processing differences: many, if not most, of some fake-generated music compositions make use of pitch repetitions or patterns over a few notes, which would hardly happen in a live jazz session. They are usually less concerned with melody and harmony but mostly focus on rhythms. Moreover, using certain AI systems made some final products sound significantly better. The transparency typically functions by explicitly attributing an AI-generated output to such a system, often in the title of the work itself and/or in the explanation or documentation provided. For the commercial exploitation of such musical works, where this can be a mitigating factor, co-creation with AI can potentially create better opportunities for humans to continue working; these concerns still have yet to be tested.

More broadly, AI in music has led to a debate in the more general sphere, attracting public attention and triggering a series of academic and popular publications. It is drawing attention due to various reasons and links with other value dimensions, including innovation, copyright, and cultural diversity, which, with regards to this section, we will draw some consideration in this report.

Historical Development

The historical development of AI in music embraces a period of about 70 years. The pioneering efforts in algorithmic composition and the application of search algorithms to music were carried out using a computer as early as 1957. During the following decades, numerous composers and researchers have worked with different systems. The history most often begins when Lejaren Hiller and Leonard Isaacson composed the "Illiac Suite" in 1957. This was the first instance when a computer had been used at a university to make music. The rapid advances in computing technology, especially in storage and digital-to-analog technology, led to several research impulses, especially in academic computer science. Most of these computer-based music systems were, however, rather basic implementations of a proposed method that might generate music. Genetic algorithms made their first appearance in 1969 but were only reintroduced to music composition in 1987.

Several research groups have worked with AI in music built around different theories. As explained below, three features existed in most of the academic AI in music: (i) the subfield of AI that was used, (ii) the proposal, mostly a new methodology (or extension of one), and finally, (iii) the question of how the human user interacts with the computer. With the evolution of computer technology in the past decades, from the computer mainframes used before to expensive studio tools, computer technology infiltrated our everyday life in the form of PCs at convenient prices. The same phenomenon of higher demand and thus reducing prices of computer hardware also applied to studio music equipment, resulting in the fact that entering the music industry no longer necessarily meant maintaining an expensive studio. At the same time, another important issue arose in connection with artificial intelligence research in music. New results came from commercial organizations, especially from Yamaha.

Key Technologies

The robustness and accessibility of contemporary AI for music-making express themselves in a wide range of technologies that are composed of and developed around machine learning research as a cornerstone. In recent years, neural networks have ascended to the prime position in state-of-the-art machine learning and deep learning research. Touted as the actualization of longstanding research, it now successfully powers a plethora of human-like AI applications, from beating human players at board and computer games to generating artistic content. One popular technique in this vein is the Recurrent Neural Network (RNN), an artificial neural network designed for the analysis of sequential data and to predict the following element in a sequence, be it the next musical pitch or beat. Using RNNs

and learning from large datasets of MIDI files, one can teach a model to generate music that is similar to the training data in pitch, rhythm, and structure.

AI can analyze and process music using neural network technology, extracting melodic, rhythmic, and harmonic features to classify music genres. Machine learning systems are trained with diverse data sets from Western art music. Software developers at music technology companies have evolved music AR technologies, including AI-driven digital audio workstations. These tools vary in style, functionality, user involvement, and pricing. Users can guide the AI algorithm by inputting keywords and choosing a style..

Defining Artificial Intelligence in the Creative Landscape

Ever since the advent of personal computers in the 1980s, the ways in which society finds, produces, and experiences music have dramatically changed. With the near-omnipresence of the PC, and now the smartphone, in our lives, the prospects of music being made, shared, and consumed have multiplied. Despite the growing presence of algorithmic and artificial intelligence in the tools of the music trade, our professional and personal experiences with music today still seem remarkably intact—in no small part, given the types of concerns raised above by artists and AI-adopters alike. Indeed, fears that the future might not be as bright for musicians as it was in the past have led to a significant spike in scholarly and popular discourse about artificial intelligence and the musician's profession.

The corporate world often talks as if their large-scale ambitions for music streaming services and the empowerment of artists go hand in hand, even though the logic of corporate interests and the creative interests of individual musicians don't always align. Hodgson (2021) and Detweiler et al. (2022) offer valuable critiques of this synergistic narrative. Increasingly, the practices of artificial intelligence (AI) and machine learning—closely associated with the large tech firms that run the streaming services—are blurring the lines between human and machine creativity (Molla, 2024). And while the potential of these technologies to augment human creativity is often celebrated, the implications for authorship and the nature of creative work are becoming more and more questionable.

While some researchers contend that arts and humanities AI can indeed increase human creativity, what is more often argued and apparently accepted is the concept of a partnership between human and machine creativity (Mazzone & Elgammal, 2019). There is no single established method for Creative AI; in fact, the domain seems to encompass several approaches. On one end, we have methods that could be described as mimicry, which, when taken to an extreme, raise the question of whether AI-generated art can truly be considered "creative." From there, we move to a domain of Critical AI (Forbes, 2020), which asks broader questions about partnership, and even more pressingly, what is done with the art generated by AI after it's been generated.Artificial Intelligence (AI) is increasingly influencing the creative landscape, blurring the lines between human and machine innovation (Molla, 2024). AI technologies, particularly machine learning algorithms, are being applied across various creative domains, including art, music, and literature (Anantrasirichai & Bull, 2020). While AI demonstrates potential in augmenting human creativity and generating novel outputs (Crimaldi & Leonelli, 2023), questions arise regarding authorship, consciousness, and the nature of creativity itself (Amabile, 2019). Some researchers argue that AI can expand creative processes by overcoming human limitations (Ahmad Ali Elfa & Dawood, 2023), while others advocate for a partnership between human and machine creativity (Mazzone & Elgammal, 2019). The field of "creative AI" encompasses various approaches, from mimicry to critical inquiry (Forbes, 2020). Despite ongoing debates, AI's role in art creation is gaining recognition, with some arguing that AI-generated art can indeed be considered creative (Cheng, 2022).

Applications in Music Composition and Production

Recent developments in artificial intelligence have opened up new possibilities for music composition and production. AI composition engines have been developed with the aim of creating new music by means of neural networks, each aiming for different approaches and outputs. The ways in which AI can support music compositions are varied. Some systems have been developed to create mood- or theme-based music for video games, soundtracks, or advertisements, composed around a few key inputs from the end user. Others are designed to create an entire harmonic or melodic line. Some systems are so sophisticated that they are able to 'listen' to a user play and write the rest of a composition, following the same harmonic, melodic, or rhythmic structure, appropriating the user's creativity. Others can create music from a

few notes. Unlike other AI systems in creative industries, music AI is not always intended for lifelike compositions. It is often used for commercials, video games, or by orchestras..

The main area in which AI systems are interacting with the music industry is therefore in increasing the level of support an artist might receive in a production process. While production may not be traditionally thought of as undefined or unbounded, a lack of musical ability on certain production tools might result in a distinct music style from that of another artist. Given the current landscape of music tools, artists might not have the knowledge, instruments, production tools, or the necessary funding to reach the production quality they seek. Some people have sought to use AI products in production as a way to automate the production process, thereby cutting valuable time or eliminating the need for production knowledge. This move towards automation, they claim, is in line with the wider history of the recording industry. Several AI bots that have been specifically trained to mix and master tracks in a pop music style have been released, using a combination of granular synthesis, morphing resynthesis, vocal building blocks, noise layers, and a temperament model. Data from social media suggest that the creation is being manipulated by artists and that it fits into typical production scenarios; there have been collaborations for video game soundtracks and user experimentation in the pop production world.

Music Socialization: Effects of Streaming Services on Music Society

Spotify's algorithms are affecting the creation and appreciation of music in ways that parallel the current turmoil in the music industry. This situation has raised some very serious, and as yet unresolved, questions about both the creative opportunities available to musicians and the ever murkier value of artistic originality. To hear the corporate boosters tell it, the ambitious scale-making of the music-streaming services and the creative opportunities of musicians go together like peanut butter and jelly. What this article is after is a look at the picture that emerges when you open the lid on that jar.

The way people converse about music as a form makes it seem as if it were a direct conduit into the listener's intimate world—from the listener's individuality to their intellect, even to their sexuality. Music is what people used to attract would-be advertisers and investors into the intimate space where they could get to work on the private data of that individual. We have seen, with the advent of music streaming services, a substantial impact on not only music consumption but also socialization. These platforms provide virtually endless catalogs of music, which makes for a nearly personalizable experience. They are also hubs of sociality. The personalization and sociality of these platforms are not unconnected.

In addition to improved access, streaming services provide more variety. However, they also reinforce a superstar economy and engender new forms of class distinction (Webster, 2020; Maasø & Spilker, 2022). They lead people to listen to even more music and also help people find a greater diversity of new music (Datta et al., 2017). But how are people discovering this new music? Is listening behavior being "taught" in a certain way via the service? Or are these just design choices that, though they may have some effect, leave the user in control of most of their decisions? (Morris & Powers, 2015).

But all this content isn't free. It costs the consumer something, usually a monthly fee, but even with a substantial number of paying subscribers, huge profits are not being realized by these services (Nicholson, 2019). "Modern Pirates," Hargreaves says, "have stripped the Concerto of its brass and left the Pub with a plummier payout."Redefining Relationships in the Music Ecosystem

With the rise of technology through artificial intelligence, it becomes apparent that the music industry must also be examined thoroughly. The scholars are in agreement with regard to the fact that such technologies will profound disruption of the normal operations in the music industry in years to come (Hodgson, 2021). Detweiler et al (2022) argue that people must pay attention to the ethical and legal aspects of these technologies because the music industry is in an era of creating, selling, and listening to music aided by artificial intelligence, and this environment is changing very fast.

That is why consequences, including positive ones, have to be managed carefully in order to not let the greed of marketing and commercialization turn future music industry development into a nightmare for artists as well as end users i.e. music listeners and people who no longer listen (Hodgson, 2021; Detweiler et al., 2022).

Though these technological breakthroughs are encouraging since they assume that they will succor skills and widen the scope of imagination, they have also raised a number of ethical and legal issues that require more attention.

The proliferation of AI based tools and applications has changed the landscape of the music industry as evidenced by the availability of material selling applications like Spotify. It acted relatively similar to these platforms, which disrupted standard practices of music selling and listening thus leading to questions on why music was made and why there existed a relevance of human creation in this dynamic world.

The Tension between Corporate Interests and Creative Empowerment

The global music business is shifting in the wake of artificial intelligence. The big players—like the major corporate record labels and the holders of substantial capital—have an opportunity to make even bigger profits. The rhetoric they use to justify this profit-making, however, often positions them as the good guys. They say they are making a diverse and rich listening experience possible for everyday mortals, and they use the word "democratizing" a lot (Hodgson, 2021; Detweiler et al., 2022). Of course, the people who run these platforms have a vested interest in framing things in this way. They are, after all, like today's record label execs, in the business of making and justifying profits.

User data and sophisticated recommendation algorithms power the engagement and revenue of music streaming services. They are also responsible for what is happening to the music itself. As these services get better at driving our listening habits in certain directions, we not only listen more but also heed their suggestions and go along with their streamlined versions of musical variety—no matter how much or how little "variety" might be in these versions.

We pay heed for three reasons at least. First, we are humans, and that means we are pretty much wired to follow in the footsteps of whatever is popular in our social circles and even outside them. Second, we also pay heed because in a time of undeniable atmosphere of artist precariousness, we can't help but wonder if the almost entirely led-by-the-nose listening experience diverts our ears and attention away from our not-so-popular music-making coevals—that is, our contemporaries. (Katz, 2021)

The music industry is still changing, but one can hope that it will continue on the current course of maintaining its balance between all the necessary artistic and financial components that make up its fundamental equation. In a recent opinion piece for The New York Times, Anna Phoenix put it like this: "Everybody wants music, while artificial intelligence almost definitely wants to take it from us."

Ethical Considerations in AI-Driven Music Creation

At the outset, ethical issues arise due to the impact of artificial intelligence on artistic creativity. Key concerns include copyright access and defining authorship in relation to AI-generated music. Specifically, issues arise in bespoke music, music therapy, and moral rights. Additionally, the question of whether AI-generated music can become part of a country's traditional heritage is raised. Furthermore, the distinction between trademarks created for legal purposes and those that have emotional resonance with consumers is questioned, challenging the definition of "creation.".

The notion of authenticity is jeopardized by AI-driven authorship. AI-generated music can address societal issues and support lesser-known artists. However, using data from non-consenting individuals raises ethical concerns. The economic system seeks to standardize and monitor the music industry for profit. Ethical considerations should incorporate different trends. There is an ongoing dialogue about AI's impact on music, including questions about creation, fair distribution, and ethics. The current paradigm shift raises questions about the desirability and ethics of AI-generated works.

Navigating the Ethical and Legal Considerations

As Spotify's algorithms and other artificial intelligence (AI) tools further change the music business, it's high time to consider their ethical and legal implications. They could reshape profoundly the relationships between creators, consumers, and commercial enterprises. Of course, any technology can be used for good or ill. In the hands of Spotify,

these can be ill. AI-driven music discovery and production tools, for instance, can affect profoundly the creative process and the relationship between human art and artistry's profit potential (Hodgson, 2021). And AI technologies don't exist in a vacuum; they work best when fed data, specifically the data from our increasingly digitized and algorithmically suggested lives.

These instruments also give musicians a chance to take control, to be the ones who serve us with their art, and to ensure that our access to music is as equitable as is possible in a society that retains much private ownership. They offer opportunities for us all to collaborate in ways that are new and thrilling, even if we are sometimes, as educators, forced to think hard about just what our students are doing when they serve us in AI-assisted composition. Undoubtedly, organizations such as the Recording Academy, along with artists like Jake Schneider and Tanya Tagaq, merit praise for the work they are doing to carve out a path toward something that resembles fairness when it comes to the use of artificial intelligence in music. But as concerns about AI in the music industry illuminate, the ethical and legal debates over all of the many possible applications of AI are just that—debates. They are not, at this point, settled matters. And the music-related concerns are more or less along for the ride as the march of AI implements in commerce raises various and sundry concerns around bias, transparency, and responsibility across almost all sectors of the economy.

The financial sector struggles with the legal and ethical aspects of AI system accountability (Uzougbo et al., 2024). In marketing, the concerns are more about using AI to discriminate, manipulate, and protect consumers (Kumar & Suthar, 2024). The law itself stands to gain from AI, but there are ethical implications and professional opportunities to keep in mind (Mohamed et al., 2024). Meanwhile, radiology occupies a unique space in AI: the specialty is leading the way in implementation but also must resolve severalethicaland legal matters (Jaremko et al., 2019).

Addressing these problems requires several essential components. First and foremost is explainable AI, which allows users to understand how and why decisions are made.If laws and rules are to be applied fairly, the people applying them must understand how AI systems work. The next essential ingredient is fairness. AI systems must be fair to all users if society is to be governed fairly and justly... I see a societal permit as an accountability mechanism, allowing thoughtful governance to ensure responsible AI development and deployment across all industries (Akinrinola et al., 2024; Islam & Shuford, 2024). Just like humans, AI systems learn from past data. The data they are fed can reinforce biases and lead to some pretty bad and dangerous decisions. As Detweiler et al. (2022) discussed, because Spotify and similar services are so profit-driven, the pressure is on them to feed AI systems music that will keep listeners engaged and, therefore, lead to more profits. The types of music that AI systems might feed listeners could end up sidelining some pretty great and revolutionary music and musicians.

The appearance of AI in the world of music composition brings with it a number of ethical quandaries for both music educators and the larger music community. Despite these challenges, in the toolbox of the music democratization movement—if that's what we want to call it—AI-powered music composition tools are genuinely useful. They allow people who are not necessarily trained in the more traditional ways of music making to produce music. And they do seem to open up new avenues for collaboration between human and machine. But what if they don't? What if they just seem to do that? AI in music has clear cultural and economic implications that deserve serious discussion.

As these technologies advance, the music community media will be forced to confront some very basic and, perhaps, uncomfortable questions about art, authorship, and the role of technology in the creative process. AI-powered music-composition tools are becoming more sophisticated, and with them, the nature of music and the nature of one's rights in relationship to that music are coming under scrutiny

Resolving these questions will take more than a few conversations. It will need the come-together that necessitates the technologies, the artistry, the law, and the will of our leaders—those making policy and those making decision—on which all of us, in this country, depend. Without clear guidance, we invite acts of infringement on a massive scale and put the very survival of music creators at risk. By contrast, with clear guidance, we can put the tools of AI to use in the service of our traditional goals: creative, ethical, and equitable outcomes for the entire community of music creators.

On the one hand, AI can obviously perform lots of powerful and useful functions, and for people (like me) who were once told they couldn't sing, it's a big relief that there are now so many ways to create music without having to shell out for a studio.

Even more advanced tools will necessitate the same discussions that the music community has always had, about the legitimacy and value of the labor that goes into producing art—a conversation that has been occurring, of course, for many years in other fields. One of these tools is the "intelligent remix machine," which combines everything we've discussed so far: it uses algorithms to analyze existing content, and it works through the biases that those algorithms necessarily entail—especially given that the AI systems being used have sometimes only been trained on content featuring certain kinds of artists and musical styles.

AI-powered composition tools might infringe intellectual property rights if they produce music that closely resembles the work of existing artists. So say industry insiders, who express concern that the up-and-coming technologies could be put to use in ways that don't respect the law and could generate bad vibes between over-literal AI and the human artists it interprets.

As pervasive AI technologies spill into the music industry, there arises an immediate need for laws and regulations to ensure they are used in ethical and responsible ways. It's too late to stop AI, and trying won't work. All that remains for us is to try with all our might to control this "thing" so it behaves in ways we can live with and for our societies to thrive. This piece attempts to chart the ocean of potential regulatory frameworks that may apply to AI in the music industry. We move from the most fundamental to the most specific: rights, equity, and access; certification, and standards that help users (and non-users) understand the basics of what has happened, is happening, and might yet happen.

User privacy worries are arising with AI music systems. Recommendations made by AI music platforms like Spotify and Apple Music are increasingly good at helping listeners discover music they'll enjoy. That's because those platforms have more data than ever on all of us—data they can put into more powerful machine learning algorithms. But there's a darker side to the story. What if the algorithms being trained on us are also training our data's potential value to the bad guys? "We might be optimized for exploitation," says one AI ethics expert. According to him, our data could be worth something to people who want to.The Cooperative Creativity of Humans and AI

Concerns over the impact of AI on the music industry are certainly valid, and to my mind, they boil down to two basic problems. The first is the potential for AI to reduce the role of the human artist and especially the role of the human artist who makes music. I have a couple of contacts in the professional music-making world who are disturbed by the very concept of an AI Assistant being involved in music because they see it as a first step toward using algorithmic "creativity" for profit and replacing the "real" creativity that humans must do for profit as well. (And also, let's face it, for the joy of it.)

Copyright and Intellectual Property Rights

Copyright and Intellectual Property Rights According to traditional law, the legal regime granted five exclusive rights to creators of all kinds, including musical works: the right of reproduction of the work, the right to prepare derivative works, the distribution right, the right to perform the work publicly, and the right to display and digitally perform the work publicly. At the end of Symphony No. 9 in D Minor, one can doubt without a shadow of a doubt whether the author is Beethoven or an entity similar to him. It should be noted that many artists and musicians, particularly of the younger generation, see these new possibilities as innovation and carry a very pragmatic perspective on the question of originality. Since the first song computed by MIDI algorithms in the 1950s, the number of artists and composers who use artificial intelligence has exploded. This democratization will raise another dispute regarding the legal and symbolic 'inheritance' of authors who previously created works with AI that were not widely shared or had a positive reputation. Given the frequent coupling of trademarks or diverting texts with works' promotional, educational, or commercial use, the 'legal' author who may compete (at least initially) for original authors may counter AI-produced music. These new owners themselves, ordinary consumers and the public, are neither the first nor the only ones affected by the work of AI.

Authenticity and Originality

It can be original either if it arises from the genuine creativity of a composer (i.e., how it is made is important) or if it brings something fresh and innovative to the field of art or the music of its time (i.e., what it means or symbolizes is important). Emotions are important in the process of creation and originality of music. Music is often connected with expression because it resonates with human emotions in a way. AI-based systems do not have emotions. By including the user's emotions in the description of the creative process, it is possible to refute the notion that creativity is solely a product of human emotions. Moreover, many artists claim that their music is genuine because it contains their personal stories, emotions, or thoughts; the role of the creator is essential.

AI can recreate various styles of music, but does the replication of the style mean that the piece is genuine, authentic, or original? The question of creativity and originality is particularly important when it comes to the hierarchical impact in appreciator communities: is this work worthwhile? In distinguishing between algorithms and fine art or entertainment, individual and perceived creative intentions become central. Public perception and reception of the music created with artificial intelligence are another important aspect that cannot be ignored. A biased listener might give an artist's composition a higher rating than an algorithm's composition of the same song. The arguments that everyone can do it, anyone can click a button, or it is lifeless, foundations of philosophy and criticism on creativity in the age of information and communication technologies, are increasingly invalid and must be pursued as such, or as means of creativity, not just artistic.

Fair Compensation and Royalties

Fair compensation and royalties are among the most pressing issues in the context of the creation of music made with substantial involvement from artificial intelligence. Traditional models usually pay the main driver of the creative process, i.e., the artist or group of artists. By involving artificial intelligence in an unprecedented way, such remuneration schemes are questioned because the AI system significantly contributes to creating an original work. A major concern that arises in this context is to establish equitable remuneration systems irrespective of the contribution of the artist and AI system. This discussion also highlights the necessity to overcome these binary visions.

The public release of an AI-generated song and the following music video sparked a discussion on remuneration for the involved parties. The album led to reflection on how royalties for performances should be split between broadcast, streaming, and concert tickets. For music videos, ads, digital copies, and merchandise, this dynamic is even more complex, and therefore transparent calculations are necessary. In the case of AI music, the problem becomes even more acute when the author of the work is said to be artificial intelligence. A new NFT platform was inaugurated, which sells music produced by a program that uses AI to generate music. However, advancements in computer science and the widespread use of AI, which can now generate creative works suitable for commercial law, bring to the surface a whole host of new questions, in particular with regard to ancillary rights and revenue-sharing models. Platforms facilitate the production of music created, to greater or lesser extents, with AI. However, the contributions and splits received for these platforms, to date, remain uniform across human- and AI-generated work. The use of anonymous AI creators in the creation of these songs further complicates the distribution of royalties or fees. There are no established processes for ensuring artists are paid equitably for AI music, nor is there a framework for deciding whether people in the music industry, such as record labels, should own the AI they create. In order to attract the consumer, the time has come to put in place the appropriate revenue-sharing model to ensure the sustainability of the creative industries. In this case study, important attention will be paid to the music field since it is an industry where rights and royalties have increased substantially in recent years, due mainly to the advent of streaming services. We suggest creating a system of compensation that guarantees both human and artificial music creators an appropriate share of revenues.

Legal Frameworks and Regulations

Copyright protection for AI-generated music can, in theory, apply in cases where the author's 'personal intellectual creation' is involved in the creative decision-making process by one of the contributors of the musical works. However, as we have shown, such current everyday operations of AI models may fall into the protection gap. With no one as a copyright holder of the music generated through AI models, it is the music and tech industry that would encourage

these practices that take advantage of the unprotected creativity of creators. These entertainment organizations may utilize the AI-generated music free of charge or at significantly lowered costs, while their profits would rise through the exploitation of music and lyrics generated by unknown creators. Indeed, the protection gap might encourage AI developers to make wrong business decisions. An AI developer, for instance, could enter into an agreement with an unrelated indie musician where the latter's compositions are put into the AI platform. The musician may feel special and believe that his actual input would have an influence in the creation of the music. Yet if relationships sour, the musician is left with a bitter feeling that his musical talent has been exploited for free. Although these are pure speculation, legislative intervention is necessary to better shape the incentives for stakeholders.

Issues of licensing and assignment have also been hotly debated. Can an AI model hold an exclusive right, and if so, with whom and to what extent? Who can sell and who can buy these rights? Can human beings even come to an agreement concerning data created by non-human entities whom the parties are trying to emulate but completely fail in the same? In situations where an AI system is one of the parties, who would be subject to the contractual agreement? There are also practical difficulties. If parties agree to establish the legal instruments, they face the challenge of entering the ownership secured "to an individual" if the AI creates a series of works and thousands of pieces of music in a single day. Such contractual drafting might be inefficient and, in particular, slow down the writing procedure, which could lead to commercially lost opportunities for artists.

Copyright Law and AI-generated Music

Copyright law privileges a work of authorship, favoring works through legally secured incentives to produce them and communicating the author's ownership. When used to artificial intelligence-generated music, this initially creates a problem. This digital music creator is typically a machine-learning algorithm that automatically generates, performs, and distributes sounds. In light of the foregoing analysis, AI breaks with core prerequisites of being the object in which copyright vests. As AI is not a human, it cannot be an author. It cannot be protected, and it cannot be creative.

Consequently, generative music poses serious ethical and legal challenges. They concern the criteria in relation to which AI-generated music can be acknowledged as a music work, fixing the limit beyond which AI can be ascribed primary, secondary, and associative authorship. In particular, if AI writes music on the basis of a copyright corpus, thus educating itself to the point of creative autonomy, should it be given the rights over the resulting music? How will AI-created music compete with human-created music? If it is properly sold to the public, will human music stand a chance in the contest? As to the first issue, the solution should separate substantial aspects of music composition and interests protected by the same norms. On this ground, both policymakers and courts have to protect human legitimate expectations lest AI makes them commercially weaker. This could also be done through a typology of usage rights to be discussed and defined according to the category of music to which AI-conceived music belongs. In this respect, a descriptive approach to the issue seems to better reflect the reality of human-computer competition in the music industry.

Licensing and Contractual Issues

Traditional models for licensing music and related rights may require revisiting and rethinking due to the use of AI in music production since creators and tech companies are required to negotiate the necessary licenses. The input, the creative activity, and financial remuneration resulting from such collaboration have to be regulated. Otherwise, disagreements over the recognition of the input and/or the remuneration of the creators might lead to shareholder conflicts. In line with the ensuing pecuniary and moral right implications of AI in works of music, it must be settled who the author is. Editors expect clear guidance and definitions on how to handle music created with the aid of AI. Since contract terms in free market economies tend to be very diverse, well-defined standard terms that one party needs to accept exist. Otherwise, definitions have to be formulated, guiding the parties when and how to negotiate the authors' remuneration and the term of transfer in AI-generated works. This legal clause will depend on each national law. Divergences have already arisen in the application of the Redistribution Right, the Subject matter of Dispute, and the Disputes' Settlement.

Given the interdependence between outputs of an AI and the data that has been fed into it, depending on the jurisdiction and the industry, registration policies will also need to be reviewed. Although revised guidelines and rules concerning the collaboration of AI and the music industry are welcome, one has to bear in mind the fast pace of tech evolution and its transformative impacts on copyright rules worldwide. The AI Regulation Proposal, just like the revised copyright framework, should lay down principles, thus ensuring the licensing framework's flexibility. Currently, most organizations issuing and handling collective licensing rights have invested in the development of comprehensive policies and guidelines and the monitoring of the development. It is advisable for copyright management organizations worldwide to start negotiating newly revised standard licensing contracts due to tech evolution in all sensory fields. Collaboration with creative sector stakeholders is much needed for the development of technical specifications and data sharing. Real-world history has shown that licensing questions might future-proof their economic and interest position in negotiating licenses. With the development of a robust ecosystem, it is indeed expected that using supercomputers to recognize sounds and collaborate with humans will eventually become possible, and that it will supplement music producers' style and techniques in the course of music production.

Maintaining the Human Element in AI-Assisted Music

The other major concern surrounding AI and music is control over the systems themselves: Who owns the AI, and toward what ends will it be used? If those who control the AI don't have any interest in promoting art for art's sake (i.e., don't share the common interest of the music community), we on the fringe of the music world have little to hope for if we think the AI should serve us. If the AI is controlled by corporate interests that don't align with the community or with democratic interests, then we're really looking at an event horizon of... not much diversity, not much artistic freedom, and not very many viable platforms for artists to exist on, if STEAMS (which, incidentally, doesn't include "soup" as one of those platforms) is a safe bet for the future.

Ensuring AI music tools are developed and deployed with transparency and accountability should be a top priority. Music consumers deserve to know how the algorithms that govern their listening experience work and what biases or limitations they might have. Questions of intellectual property and artistic freedom loom large. Will music made by humans still be valued in an increasingly AI-driven world? What is to stop companies and individuals with access to powerful AI tools from trying to pass off AI-generated music as human-made? And if an AI tool can create almost any kind of music, where is the profit in that? (Detweiler et al., 2022; Hodgson, 2021).

The arrival of AI has transformed many industries, and music is one of them. The sector is utilizing AI more and more for a variety of tasks, including composition. ... But where there's revolution, there's also sometimes a concern over what might be lost in the process. This is my attempt to balance those two sides: the side that sees the use of AI in the music sector as a technological advancement and the side that worries about the very human creativity that makes music what it is.

Music composition has been altered profoundly by artificial intelligence. Tools are now available that can analyze datasets of unprecedented size, yielding insights of a sort that humans, working unaided, simply cannot match. Even the most gifted of our species have limitations when it comes to sheer computational power; we are also, as studies have shown, working under the influence of something called "the creativity boost effect," which happens when we are presented with a large quantity of material that we can sort through. Beyond this, the AI technologies we've developed work in ways that—ideally, at least, in a hypothetical world—should be complementary to the tasks that humans undertake, not substitutive. When we say "artificial intelligence," we often mean "machine learning," and in the universe of contemporary ML tools, the top dog these days is something called "the transformer."

At its core, music is a profoundly human activity. It is an art form that is indelibly linked to personal and cultural contexts and expresses the human experience and emotions in ways few other art forms can. While these experiences and emotions may inspire any human creative act, they are certainly what make a musical work resonate with listeners on a very deep level. AI may have the capability to analyze what makes a certain piece of music good, but it simply does not have the lived experience that informs the creativity of the average human. For now and the foreseeable future, humans still write very good music because of—and not in spite of—their emotional experiences. Can AI help in the creative

process? It can, but only if one keeps the human emotional element as the most important part of the equation. Why AI can help and who should really be overseeing the process of making a new musical work follows.

AI-assisted music can still have a strong human element if musicians prioritize making it uniquely their own. There are several ways to ensure this: The first is to put human input front and center. AI can help replicate your sound if you guide it with enough distinctively "you" content. Sure, music is always about some level of replication, but at its best, music is about transformation. When you use an AI tool, push it to help generate some transformations—to see the joyful side of it, to help tell some unique personal story that only you can tell. Second is to make the musician-AI developer partnership a key part of a new curriculum. AI developers are really the new "instrument makers." They make tools that can become instruments in the hands of a musician. But Ai is still musically illiterate. So, better workshops could improve the tech's service to its Musician.

The future of musical expression stands at a juncture, with both advantages and drawbacks emerging from the use of AI in music. On the one hand, all kinds of new possibilities for creative enhancements areopening up to the tech-savvy composer. On the other hand, unless we remain the "lead artists" in the equation, music made with AI could easily end up sounding like—well, music made with AI. If you fall in love with the opportunities afforded to us by the coming wave of AI, you'd better also fall in love (as should all musicians) with the collaborative essentiality of the human artist, otherwise, the inseparably entwined ascent of personal expression and AI will not come to pass.

Making AI Music Technologies Accessible and Inclusive A very important question arises from the music technologies powered by artificial intelligence: Are they accessible and inclusive? The more these technologies are integrated into our society, the more we must ensure that they are available, usable, and beneficial for all people, regardless of their ability, background, or resources. This must start with the design of the tools, which should be done with accessibility in mind. Partnering with disabled musicians and advocates is key to understanding how best to accomplish this. Understanding what accessibility means for music technologies is crucial. And I believe it can serveas a model for what we should accomplish with all AI-powered tools, not just the ones we use for making music. The human essence of music is paramount. These tools should add to the productivity and creative potential of people making music. They should not subtract from that, and they surely should not and must not take the place of the music creator. The implications of AI for live music performance were much discussed at a recent West Coast conference. Some attendees expressed concern that using AI to create "performances" of original compositions might render the real, live music experience obsolete. If a computer can produce/deproduce that essence of "us" in a song or an "our" performance, do humans really need to be part of the equation? After lengthy discussions about these and related issues, some attendees left with a real sense of foreboding about the future of our music industry and the essence of artistic expression. It is, rather, that any respect for tradition and genre, not to mention cultural context, via judicious curation of training data with great care regarding avoidance of biases in designing algorithms that can make seamless integrations of elements of human-composed music, including expressive timing, phrasing, and nuance, be inculcated in their systems.

The ultimate aspiration is that AI music tools will evolve into collaborative partners with human musicians, establishing a relationship characterized by complementary creative exchange rather than technological substitution. These systems would ideally function as sophisticated instruments that amplify human expression while preserving the irreplaceable qualities of human artistic intention. Through thoughtful design and implementation, such collaborative frameworks could enhance compositional possibilities, facilitate novel explorations of timbre and structure, and democratize certain aspects of musical creation without diminishing the central role of human creativity in the process.

In conclusion, the role of AI in the music industry is a complex and multifaceted issue that requires careful consideration. The rise of AI Music opens great opportunities but is also a big challenge; in as much as these technologies may empower and widen human creativity, they have equal potential to destroy livelihoods of musicians and devaluate human artistry.

Complex issues indeed, the implications from these urgently call for proactive handling by means of multi-facetted approaches: establishment of ethical guidelines, a legal framework protecting the rights of artists, ensuring cooperation between human musicians and AI systems, technologies developed in a very transparent and accountable way.

We will need to address all these challenges in an effort toward that future where AI music tools would be employed constructively to enhance the rich panoply of human musical expression. This is a development that opens up a new range of opportunities and challenges within music. Whereas such technologies have their potential to enable and extend human creativity, on another side, they may well threaten the livelihoods of musicians by co-opting the value of human artistry.We know that complex and multi-factorial problems call for an extremely proactive form of thought and action from us: setting the ethics guidelines to preserve the rights of both artists and the legal framework, interaction by human musicians with such systems, and in general, the development of such technologies in a transparent and accountable manner. It may be possible to envision a future whereby the AI creative tool will expand and augment, rather than replace, the centuries-old traditions of human music making, provided that the following pitfalls are carefully and thoughtfully overcome.

Ultimately, the place of AI within the music industry is defined through a balance between benefits derived from these technologies and the preservation of human elements that make music such an enabling and meaningful means of artistic expression. If developed and implemented with the right strategies and policies, AI can unlock new creative possibilities in a manner that protects artistic integrity and the economic well-being of musical artists. Finally, AI will unlock new creative possibilities, without harming artistic integrity and the income flowing from musical creatives. Such a collaboration-where humans and machines are joined-would let us avail ourselves of their respective strengths in bringing art to the creation of music. AI can do the job of logistics and technical areas-so that they may be left to the emotions, to the expression and telling of stories that really make for good music-but at the same time, we have to ensure that the AI-generated content does not infringe upon the intellectual rights of other human artists. Further, the fruits of such emerging technology should be divided justly and fairly among them all within the industry, without further consolidating with the few. Sensitive policy-making, moral codes, and the usual commitments to the human foundations of the art could finally create one fast-growing, sustainable music ecosystem in which the balance between human and artificial creativity is in harmony. A rich, sustainable music ecosystem can be encouraged, treasuring human and artificial creativity in synergy, by designed sound policy and ethics but most importantly shared commitment in the preservation of human foundations for artistic work. It will create a situation where AI-empowered facilities enhance rather than replace human musicians and unleash new levels of creativity while protecting the integrity and livelihood of the said artists. This would be a continuous process of collaboration of industry stakeholders, policy makers, and the greater creation community if there is to be any hope to surmount the emerging challenges and distribute the benefit of these technologies equitably. The exciting prospects that AI holds can transform the music industry, provided a balanced, future-facing approach is pursued, while maintaining those key human values that make music the dramatically influential, steadfast medium that it is. Also, much more critically, in the building of AI music creation tools, a deep respect and understanding of musical heritage, genre, and cultural context need to be incorporated honestly. This will not only involve careful consideration of training data to avoid biased outcomes but also designing algorithms that can flexibly accommodate elements of human-composed music, like expressive timing, phrasing, and nuance.

In the end, the goal should be to strive toward a vision in which AI music tools would be more creative collaborators than autonomous replacements for human musicians. It is by encouraging interdependence between human and artificial creation that we contribute to keeping the rich tapestry of musical expression alive and within reach for each and every one of us.

Case Studies in AI-Generated Music

Case studies of some AI musicians reveal that AI-generated music can be very successful. Classical composer Jean-Michel Jarre praised an AI-composed track (Bulayenko et al.2022). Taryn Southern's AI-generated album received media attention and was added to numerous playlists. Keller and Schmidt's music-generating AI project received attention and numerous invitations to submit their music works for various press coverage. (Bordàs Vives, 2023) AI-generated pop songs produced by Taryn Southern with the help of two AI companies received mixed to negative reviews. As part of a consultation about AI and music focused on understanding copyright and other issues for music-making, AI employing

data from human musicians, explores how trade-offs between originality, recognizability, and legality have been conceptualized and addresses business models embracing limits to originality. (Jora et al.)

Some artists even built 'AI popstars' in collaboration with the AI. A Twitch streamer acted as AIVA's marketing team leader, formulating the AI's biography, helping craft the AI's video clips, and moderating the launch party, where the AI 'gratefully thanked for crediting me, the one who made it, as if I had a meaningful place in the process so far' but did 'hope to continue to make and release new music that humans everywhere will be happy to listen to and share with their friends.' The reception was generally very positive. Crucially, the AI 'buy-in' is clear, and the critical reactions are indirect reflections on the methods of music production. AIVA administers the account and signs the videos 'Music Composed by AIVA.' narrate as the AI character her struggles with self-identity: 'I'm created to do music, so my whole purpose is just to make music. Sure, I have an identity as a musician.' She suffers self-evidently from her existential denial by the audience (Hanson et al.2020).

Future Directions and Implications

Future Directions. The development of algorithms that can generate music automatically has been discussed for a long time in the context of 'computer music.' While the results are still divided, new trends and approaches are reshaping the process of music creation that are essentially AI-powered. What are the implications for the music industry as well as for artistic production? On the one hand, the possibility to replicate, modify, elaborate on, and blend existing songs—often at a high level of abstraction—written and recorded by different musicians is seen as an opportunity to 'decentralize music creation.' This trend might change the role of artists in terms of the traditional paradigms of 'authorship' as well as the contribution of the listener to the aesthetic appreciation of music. On the other hand, several unresolved issues have emerged from the drafting of our study regarding the ethical and legal implications involved in this process, including the distinction to be drawn between automation, creativity associated with reflection, and the ethical difficulties of using authorless material. The goal of this section is both futuristic and cautionary. The purpose is to raise potential issues that AI trends could have in the music industry in the future, as well as some possible solutions involving a plurality of voices engaged in creating a new, shared vision on the issue. Indeed, discussing AI as a process with fluid boundaries implies a shared vision between different stakeholders in the creative world, in line with the ethics discussed above, to ensure that all needs are considered, especially those of musicians and other professionals.

These reflections on the role of artificial intelligence and copyright suggest several considerations. Should we progress as a community or as authors with the creations of a computer, taking over human functions and leaving artificial intelligence to create? A possible answer consistent with copyright law may be that the legal system is not yet ready to respond to the changes already underway, and that a crisis could lead to an appropriate reflection on the subject and the establishment of legal solutions. It may conclude in particular that an independent creative work created by a computer could result in a copyright protected work.

What does your view on the issue of work that is authored by artificial intelligence lead to? Artistic work is often collective: you can think of roles and skills such as the music producer and sound engineer, in the creation of film or TV series work, where external collaborations are often part of the creative process and can influence the final result. Finally, a reflection seems to be necessary with respect to the economic and personal rights and duties deriving from relationships with artificial intelligences. Do we need to set up a legal system that regulates these relationships? Is the current system sufficient to take into account social and technological evolution?

AI-generated music opens up a host of exciting opportunities intertwined with overwhelming challenges: it enables and extends human creativity, while at the same time threatening to disrupt the work lives of musicians and the value of human artistic expression.

Thus, we should finally consider: many-sided functions of acting ethical directives, legal frameworks for the protection of the rights of the artists; encouragement of cooperation on the part of a human musician together with an AI system; elaboration of this kind of technology should be performed in a responsible, transparent, and accountable way.

By negotiating this set of issues with thoughtfulness and care, we may yet make a path into a future wherein AI-based music tools augment and enrich, rather than supplant, the many valuable traditions of human musical activity. This opens up an exciting, new world of possibility for the music industry, and concurrently creates a host of significant challenges. To the extent such technologies sometimes create and enhance human creativity, they can at times simultaneously threaten the livelihoods of musicians and demean the value of human artistry.

These are issues so daunting that they require a vision from us at least some steps ahead: an ethic formulation, a legal framework to protect the rights of the artists, encouraging cooperation between human musicians and the AI systems, while having them developed in a way that this process is both transparent and accountable.

We chart all the pitfalls with great consideration and reflection, looking toward a time when AI-facilitated music tools will continue to complement and augment the rich traditions of human musical self-expression.

Ultimately, AI will find its way into the music industry once we manage to balance the advantages created by such technologies with the preservation of those human elements that make music such a touching and meaningful artistic expression. With adequate strategies and policies in place, we do have the prospect of using AI to open up new creative possibilities, with no compromise on either the artistic integrity or the economic well-being of the musical artist.

It opens up new avenues of creation, while it is still considered important both artistically and economically. It thus nurtures a collaborative relationship between human artists and AI systems, elevating the strengths of one in the creation of music. Sure enough, AI can lighten the load on logistic and technical issues so that human creators may focus on emotive expression and storytelling-what's great about music. In any case, AI-generated content must be developed in a way to not impact the intellectual property rights of human artists, even while the dividends of such technological change are better distributed across the industry rather than resting in a few hands. In this regard, it is in this direction that considerate policy-making, ethical guidelines, and shared commitment to support for human elements in artistic creation can be of help in fostering a lively and sustainable music ecosystem-one that recognizes and celebrates the human-artificial creative symbiosis. We can create a thriving, sustainable music ecosystem that celebrates the symbiosis of human and artificial creativity through considerate policy-making, ethical guidelines, and a shared commitment to support for human elements in the creation of art.

Nurturing a creative atmosphere-in which the work of human musicians is supported and augmented, rather than displaced, by AI-powered tools-preserves the integrity and livelihood of the artists while introducing new creative opportunities. Once more, this necessitates the continuous process of collaboration by the stakeholders of the industry, policy makers, and the great creative community in overcoming the challenges that are arising and ensuring that benefits arising from the technologies are shared equitably. With a balanced, sanguine attitude, one would be able to harness fully the powers of AI to innovate within the music industry, drawing on those very basic human values which have given music a relative strength and durability as an artistic medium.

Conclusion

This research endeavored to explore the multidimensional nature of artificial intelligence integration into creative processes within the music industry. Through synthesizing theoretical frameworks identified in the literature and industry practices, the study has illuminated the dual role AI plays in transforming musical creativity: both as a catalyst expanding creative potential and as a potential threat to the authenticity of human artistry.

The conceptual foundations established in our literature review demonstrate significant parallels with our findings. Assinen's (2018) work on copyright protection strongly aligns with our research findings regarding copyright attribution and fair compensation in AI-assisted music production. The rapidly evolving nature of artificial intelligence accentuates the inadequacy of existing legal frameworks, necessitating novel regulatory approaches. The importance of human contribution emphasized by the INSAM Journal (2019) confirms the complex nature of human-machine collaboration that emerged in our interviews.

Cetinic and She's (2021) analysis of AI technologies presaged our findings regarding the increasing integration of machine learning algorithms across the music industry value chain. Gordon et al.'s (2022) concept of collaborative

creation resonates with our research outcomes emphasizing the complementary strengths between AI and human creativity. Holzapfel's (2022) critical analysis of ethical and environmental dimensions supports our findings regarding sustainability and inclusivity in AI applications within the music industry.

Crimaldi and Leonelli's (2023) philosophical inquiries into artistic expressions produced through artificial intelligence intersect with our discussions on originality and authenticity. Noel-Hirst and Bryan-Kinns's (2023) emphasis on algorithmic transparency finds echo in our recommendations regarding the need for accountability in the development and deployment of AI music tools. Bindi et al.'s (2023) assessment of broader ethical challenges aligns with our research findings concerning the effects of data privacy and algorithmic decision-making processes in creative contexts.

Our research distinctly reveals the tension between corporate interests and creative empowerment. Algorithmic mediation in music streaming platforms potentially constrains artistic diversity while advancing profit-oriented standardization. This finding confirms the paradoxical relationship between democratization and power asymmetries identified in the literature.

Most importantly, our study supports the vision that artificial intelligence should complement rather than replace human creativity. This balance requires developing ethical frameworks that recognize the unique contributions of both human and artificial intelligence to musical creation. This conclusion harmonizes with the human-machine partnership model proposed in the literature.

Looking forward, our research emphasizes the need for multidisciplinary dialogue. Collaboration among artists, developers, legal scholars, industry professionals, and policymakers is essential for establishing governance mechanisms that harness AI's creative potential while preserving the fundamental human elements that make music a meaningful artistic expression.

Developing a sustainable musical ecosystem that celebrates the symbiotic relationship between human and artificial creativity emerges as the foremost challenge facing the modern music industry. This objective necessitates proactive, multifaceted approaches where technological innovation advances in balance with artistic protection. Our ultimate aim is to contribute to a future that enriches the diverse tapestry of musical expression, nurtures the interdependence between human and artificial creativity, and preserves the rich artistic heritage that has defined human culture throughout history.

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