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Paradigm Shift and Rule Restructuring: Addressing the Dilemmas of Digital Music Rights Attribution in the Age of Artificial Intelligence

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Abstract

The integration of artificial intelligence (AI) into digital music production has blurred the boundaries between creative subjects, complicated the attribution of rights and interests, and exposed a mismatch between existing allocation mechanisms and emerging production practices. Taking the Soda Music platform as its research object and drawing on Actor-Network Theory (ANT), this study examined structural changes in digital music production and the allocation of rights and interests in AI-enabled environments. The findings indicated that AI had shifted digital music production from a traditional model centered on a single human creator to a collaborative model involving multiple actors—"human–AI–platform." Through algorithmic rules and private contractual arrangements, platforms intervened in music production, rights determination, and revenue distribution, thereby establishing a platform-dominated structure for allocating rights and interests. Traditional approaches to rights determination, which center on human creators, proved inadequate for the production relationships emerging from human–machine collaboration. In response, this study proposed a collaborative allocation mechanism for humans and AI, a dynamic revenue-distribution mechanism, and an integrated governance framework that incorporates both technological governance and humanistic values. These proposals offer a reference for improving the allocation of rights and interests in digital music in the age of AI.

Keywords

Artificial Intelligence; Digital Music; Allocation of Rights and Interests; Actor-Network Theory; Innovation Ecosystem

1. Introduction

With the transition from physical records to digital streaming, the central tension in the music industry has shifted from curbing piracy to regulating the dissemination and use of virtual data [1]. The integration of AI has not alleviated this dilemma; rather, it has generated three structural tensions across the entire chain of creation,

distribution, and consumption: the proliferation of creative subjects, the restructuring of rights relationships, and imbalances in allocation mechanisms. AI-generative platforms represented by Soda Music provide a typical setting in which these tensions emerge. By deploying its own large-scale model, the platform enables users to generate music in batches through prompts, incorporating both users and AI into the production chain. During distribution and consumption, algorithms govern content delivery and user matching, intervening deeply in the realization of a work's value. As AI permeates every stage of the process, the central concern of copyright has shifted from "how to protect human-created works" to "how to determine ownership in human–AI collaboration." The traditional copyright framework, which places the human author at its center, faces a serious crisis of interpretive adequacy when confronted with new forms of production involving human–AI co-creation and deep platform intervention, revealing structural deficiencies in institutional provision [2].

This study adopts Bruno Latour's Actor-Network Theory (ANT) as its primary analytical framework. Moving beyond the anthropocentric assumptions of conventional legal research, ANT examines human actors alongside nonhuman actors—including AI, platform architectures, and algorithmic rules—on an analytically symmetrical basis. Through the mechanism of "translation," it reveals how multiple actors construct one another and form networks through dynamic interaction. In the context of digital music, this perspective makes it possible to analyze systematically how AI shifts from a "creative tool" to an "actor" with agency: AI responds to instructions from human creators while also influencing creative direction and value distribution through its algorithmic characteristics. This helps illuminate the paradigm shift in rights relationships and the process of rule restructuring under human–machine collaboration. Building on this approach, the study also draws on innovation ecosystem theory to explore how a reasonable mechanism for allocating rights and interests can be established among the multiple actors of humans, platforms, and AI, offering theoretical and practical guidance for the coexistence of technological innovation and humanistic values in digital music.

2. How Generative AI Restructures Digital Music Production Networks

With the widespread adoption of the internet, digital audio technologies, and cloud-based collaboration tools, digital music platforms have moved beyond the constraints of physical media and offline spaces. They no longer function merely as channels for music distribution; instead, they intervene throughout the entire chain of creation, production, collaboration, incubation, distribution, and monetization. In doing so, they break up previously closed production chains, restructure relationships among actors and modes of collaboration, and reconfigure resource allocation, giving rise to new platform-led music production networks.

In recent years, the application of generative AI on digital music platforms has transformed AI from a merely auxiliary tool into a system capable of generating multiple musical variations based on core elements of an original track, including melody, style, arrangement, harmony, and rhythm. By learning from large-scale music datasets, generative AI can autonomously decompose a work's core musical features and produce variations without continuous human involvement. This capability has broken through the limitations of traditional human-led iteration and platform-based modular collaboration. Building on the open production networks established by digital platforms, it further enables intelligent, automated, and diversified iteration in music production, becoming a key technological variable reshaping contemporary music production logic, collaborative models, and content forms. Generative AI platforms such as Soda Music are moving the modern music industry from networked collaboration among humans toward a new phase of intelligent production based on human–machine collaboration.

As a result, digital music production networks now comprise a more complex structure of multiple actors. Human creators contribute ideas, aesthetic judgment, and production decisions; AI undertakes some content-generation and technical-execution functions; platforms provide technical infrastructure, rule systems, and distribution channels; and users participate in value creation through creative inputs, content consumption, and data feedback. These actors form interdependent network relationships. Music production is consequently shifting from a relatively linear model centered on human creators to a networked model involving "human–AI–platform–user" collaboration.

This transformation means that AI does more than improve creative efficiency: it changes who participates in digital music production, how they participate, and how relationships among actors are formed. When a musical work is no longer completed independently by a single human creator but instead emerges through the combined effects of human creativity, AI generation, platform infrastructure, and user data, the production relationships built on the assumption of an identifiable human author require new interpretation. Restructuring the production network is therefore a prerequisite for understanding subsequent changes in rights relationships. Only by first clarifying the composition of the network and the changing relationships among its actors after AI enters the process can the allocation of rights, responsibilities, and interests among different parties be further examined.

3. From Structural Restructuring to Rights Negotiation: Allocation of Rights and Interests through Actor "Translation"

As discussed above, the integration of generative AI has shifted digital music production from a relatively simple structure centered on human creators to a production network involving multiple actors, changing both the composition of the

network and the relationships among its participants. When ideation, generation, distribution, and data feedback are jointly undertaken by different actors, the existing relationships among rights, responsibilities, and interests—formed around a single human creator—must also be redefined. The central issue for digital music in the AI era is therefore not only how production networks are restructured, but also how actors negotiate relationships and competing interests to establish new arrangements for allocating rights and interests. Accordingly, this study applies ANT's mechanism of "translation" to examine how platforms, creators, AI, and users are assigned different roles within the network and how these relationships shape the formation and distribution of rights and interests.

3.1. The Platform as an Obligatory Passage Point: Problematisation and the Dominant Construction of Network Alliances

In ANT, an "obligatory passage point" (OPP) is a critical node through which actors must pass to realize their interests; the actor controlling that node can consequently dominate the formation of a network alliance [3]. Digital music platforms are becoming both structural shapers of production networks and OPPs [4].

Through problematisation, platforms translate the diverse demands of other actors into agendas under their own control. Soda Music does not directly address whether AI-generated content is copyrightable. Instead, through Miaoxiang, it lowers the threshold for ordinary users to create music, while its user agreement declares that "all intellectual property belongs to the company," and access to Douyin traffic serves as a bargaining chip. In its public messaging, the platform emphasizes "technology and culture" and the lowering of creative barriers. For example, it partnered with Beijing cultural and tourism authorities on an AI music activity themed around the Dragon Boat Festival, framing the transfer of rights as technological empowerment. In this way, the platform can occupy the gateway to ownership through private contracts without changing copyright law.

The platform also incorporates technical actors into its own governance through technological internalization. The sources of training data used by Miaoxiang AI are not publicly disclosed, and its generation logs are not open to external audit. Soda Music thereby turns external technological innovation into an internal instrument of discipline, incorporates the demands of technical actors into its own ecosystem, and strengthens its control over the discourse surrounding music creation.

Algorithmic recommendation further becomes an indispensable route through which creators participate in the platform ecosystem. The platform uses traffic allocation as a form of reward and prioritizes AI-generated content. Creators seeking exposure are consequently pressured to accommodate the algorithm, while some works that emphasize emotion and nuance may seem "mechanical" and lose their warmth [5]. Creative freedom is thus converted into standardized output, and artistic expression increasingly gives way to the pursuit of traffic metrics.

3.2. Role Negotiation between Human Creators and AI Systems: Power Negotiation in the Translation Process

Within platform-dominated network alliances, the boundary between the roles of human creators and AI is continually negotiated and reconfigured. This process manifests itself both in the partial substitution of creators by AI and in creators' attempts to domesticate AI in return.

Consider the lyricist Shui Bi Xiang Fei, who wrote the lyrics personally, while the melody, harmony, and synthesized vocals were generated by Miaoxiang. The credits read "Lyrics: Shui Bi Xiang Fei | Composition: Miaoxiang | Vocals: Miaoxiang." However, Miaoxiang's user agreement stipulates that "all intellectual property belongs to the company," further constraining the creator's economic interests through private contract. The creator's role shifts from that of a conventional "rights holder" to a "licensed user." Meanwhile, "Da Tou Zhen" enters the conventional singer–fan relationship as an AI singer with no human performer behind it. It occupies the position of a performer without bearing the costs associated with signing contracts, negotiating revenue shares, or managing image rights. This creates multiple gaps involving the reproduction rights associated with cover versions, performers' rights, and listeners' right to know, while the platform becomes the principal beneficiary.

Together, the two cases illustrate, respectively, a situation in which "the human remains, but contractual terms hollow out ownership" and one in which "the human is absent, but AI still occupies the performer's position." They show that the entry of AI into digital music production networks challenges conventional rights-determination models in two ways: the boundary of the author as a person is weakened, while private contracts partly displace the function traditionally performed by public-law rules.

3.3. The Passive Translation of Users: Data Contributions, Relinquishment of Interests, and the Predicament of Agency

Within platform-dominated network alliances, users—as data contributors and content consumers—are undergoing a profound process of passive translation and becoming caught in a predicament concerning their agency.

First, platforms implicitly discipline user behavior through interface translation. Soda Music adopts a radio-style interface in which playback begins immediately upon opening the app, while search is relegated to a secondary entry point. Users are not necessarily "looking for a song"; instead, the algorithm feeds them the next track. In ANT terms, the interface pre-programs behavior. Users may believe that they are listening freely, yet each swipe generates a "like," "skip," or "completed listening" label for the algorithm. Through this interface design, users unconsciously accept the platform's regulation of their musical tastes and gradually become dependent on feed-based recommendations.

Second, platforms use affective computing to convert users' emotional experiences into commercial resources within the data-production chain. Soda Music's model—allowing users to exchange 80 seconds of advertising for 24 hours of uninterrupted listening and offering a monthly membership for only RMB 8—effectively commodifies listening behavior twice over: behavioral data is used to train algorithms, while users' attention is sold directly to advertisers. Users are translated from consumers who pay for cultural products into "free labor" that supplies data and attention; their emotional experiences and time spent on the platform become quantifiable commercial resources.

Third, passive translation produces a structural tension between users' agency and the relinquishment of their rights and interests. The platform initially capitalizes on the ambiguity between AI-generated and human performance to foster emotional connections, adding "AI-generated" labels only after regulatory pressure emerges. Users may form parasocial relationships with AI without knowing its nature, meaning that their right to know is delayed and their trust depleted. When the platform uses this data to train algorithms and increase user engagement, algorithmic systems displace users' autonomous choices, creating a profound tension between "freedom of choice" and "algorithmic guidance." Users thus become both creators of platform value and subjects governed by platform power, with their agency progressively eroded through passive translation.

4. From Competition to Symbiosis: An Allocation Framework Based on Innovation Ecosystem Theory

The central contradiction in the allocation of rights and interests in digital music in the AI era is the paradox whereby technological empowerment and the deprivation of rights occur throughout the production chain, generating structural imbalances as multiple actors compete for power. Traditional law focuses on the static determination of "ownership," while technological tools primarily improve the efficiency of rights identification; neither can adequately address the institutional demands of dynamic collaboration. A systematic framework capable of accommodating multiple interests is therefore needed. Innovation ecosystem theory situates multiple actors within an interdependent and co-evolving system, moving beyond anthropocentrism by incorporating AI, platforms, and data as nonhuman actors and examining their roles and contributions to value creation. On this basis, this study proposes a shift from competition to symbiosis and develops a framework for allocating rights and interests through the collaborative coexistence of multiple actors.

4.1. A Mechanism for Collaborative Symbiosis among Multiple Actors: From Anthropocentrism to Human–Machine Collaboration in Rights Determination

Collaboration and symbiosis among multiple actors are central to an innovation ecosystem. In digital music, where humans, platforms, and AI coexist, platforms should transform themselves from centers of power into "ecosystem architects" [6], bringing multiple actors into a collaborative framework through institutional design.

First, a triangular collaboration model involving users, platforms, and AI should be established, with roles and interests clearly defined. Soda Music could develop a modular interface through which AI developers package algorithmic components, musicians contribute creative ideas, and AI generates musical variations. Initial copyright ownership would belong to the musicians, while developers would receive revenue shares based on usage. For user-participation scenarios, a dual-track mechanism covering "creative input" and "data contribution" could be established, granting users 5%–10% of streaming revenue and transforming them from passive contributors into participants in benefit-sharing.

Second, a full-chain value co-creation mechanism should quantify the contributions of multiple actors and link them to allocation outcomes. Soda Music could develop an AI creation-traceability system through its technical platform to record and assess the respective contributions of humans and AI. For example, in a song for which a musician provides the lyrical framework, AI generates the melody, and users participate in optimization through voting, rights and interests could be allocated according to a ratio of "60% human creativity, 30% AI technology, and 10% user participation," translating actor participation into quantifiable grounds for allocation.

Third, industry alliances should formulate common standards and enable cross-platform recognition of rights. Soda Music could use its position as a leading platform to promote a Digital Music AI Creation Charter and establish a collaborative mechanism based on complementary strengths and shared risks. Such a mechanism would standardize cross-platform recognition of rights and extend triangular collaboration beyond an individual platform to the industry as a whole.

4.2. A Dynamic Revenue-Distribution Model: Balancing the Interests of Humans, AI, and Platforms

Addressing imbalances in the allocation of rights and interests requires a dynamic revenue-distribution model for humans, AI, and platforms that takes both efficiency and fairness into account. "Dynamic" refers not only to adjusting allocation weights according to the actual contributions of human creators, AI generation, and platform distribution, but also to mitigating traffic concentration caused by algorithmic recommendations through measures designed to counter the Matthew effect. Improvements can be made in three areas: contribution assessment, traffic adjustment, and algorithmic disclosure.

A system for assessing human–AI contributions should translate interactions

between human creation and AI generation into quantifiable allocation rules. Assessment could examine three dimensions—creative direction, aesthetic judgment, and technical execution—and use indicators such as the complexity of the initial prompt, the number and consistency of selection rounds, the adoption rate of AI-generated content, and the extent of human revision. Relevant data could be recorded using blockchain-based evidence preservation. A "baseline ratio plus dynamic adjustment" model could then establish initial allocation frameworks for fully AI-generated works, deeply collaborative human–AI works, and human-led works, with subsequent adjustments based on actual contributions. In fully AI-generated production, AI developers and platforms would receive the principal shares; in deep human–AI collaboration, human creators would remain central, receiving 50%–60%; and in human-led creation, humans would retain a predominant share of 70%–80%, balancing recognition of AI's contribution with the central role of human creators.

A mechanism to counter the Matthew effect should be introduced to regulate traffic concentration caused by algorithmic recommendations. Additional traffic weighting could be provided to high-quality long-tail works with relatively small existing fan bases. A fixed proportion of platform advertising revenue, such as 3%–5%, could be allocated for compensation based on content quality and user engagement. New creators and those with few followers should also receive baseline traffic, creative guidance, and support in securing commercial partnerships, helping mitigate the "winner-takes-all" effect.

An algorithmic disclosure mechanism should transform recommendation systems from platform-controlled "black boxes" into systems subject to oversight. Platforms could disclose core indicators and their weights, calculation methods, iteration rules, and the effects of parameter adjustments to creators and auditing bodies. Relevant information could be provided through parameter-visualization interfaces and quarterly transparency reports. Third-party audits could also be triggered when recommendations for niche music remain below a specified threshold for consecutive periods or when joint complaints from creators reach a defined scale. A closed-loop intervention mechanism could include reserving slots on emerging-artist charts, recalibrating algorithmic parameters within a specified period, and providing creators with appeal procedures. These measures would strengthen creators' ability to understand and constrain algorithmic rules and allocation outcomes.

4.3. A Governance Framework Integrating Technology and Humanistic Values: Institutional Coordination and Cultural Development

Institutional development provides the foundation for the stable operation of an innovation ecosystem. As AI becomes deeply embedded in the digital music industry, a governance framework integrating technology, law, and culture is needed to

reconcile technological innovation with humanistic values.

At the technological level, a tiered and differentiated system for determining rights should be established. Drawing on the Soda Music context, rules governing copyright ownership and the allocation of interests should distinguish works according to the degree of AI involvement. For works that use AI only for auxiliary functions such as automatic pitch correction or rhythm optimization, copyright should belong to the musician; platforms and AI developers should receive reasonable service fees under technical service agreements and should not claim copyright in the work. For collaborative works, such as those in which AI generates the melody, a "dual attribution plus proportional determination" model could be applied: the human lead creator would receive more than 60%, developers 20%–30%, and user prompts 10%–20%, with smart contracts calculating the shares automatically. For fully AI-generated content, a "human review threshold" should be imposed, requiring at least 30% secondary creation before commercial use. In cases where AI singers such as "Da Tou Zhen" occupy the role of performers, the rules should clarify that virtual AI singers do not hold performers' rights in the legal sense and prohibit platforms from misleading consumers through anthropomorphic presentation. AI voice-cloning covers of copyrighted songs should not qualify for neighboring rights as performances and should carry a prominent "AI-generated" label.

At the legal level, an adaptive governance framework should be developed, with differentiated governance measures adopted according to the industry's stage of development. During the technological accumulation stage, innovation should be encouraged; during the technology integration stage, the boundaries of rights and responsibilities should be clarified; and during the industrial empowerment stage, a pluralistic governance structure involving government, platforms, organizations, and creators should be established. The development of soft-law instruments such as a Digital Music AI Creation Charter should also be promoted, providing flexible institutional tools to support technological innovation and protect rights and interests.

At the cultural level, a shared commitment to technological humanism should be fostered across the ecosystem. Soda Music could establish an AI Music Ethics Committee to formulate ethical rules for AI functions and promote knowledge of blockchain-based rights determination and infringement remedies through initiatives such as AI music creation competitions and public courses on copyright protection. These efforts would strengthen creators' ability to exercise control over technology and protect their interests, fostering an ecosystem-wide consensus that places technological innovation and humanistic values on equal footing.

3.4 Dynamic Evolution: Building a Continuously Optimized Ecosystem

The healthy development of an innovation ecosystem for the digital music industry does not depend on static institutional design; rather, it relies on a dynamic

evolutionary process driven by four dimensions: policy, technology, markets, and organizations [7].

In the initial stage, market competition and technological breakthroughs are the primary drivers. In response to the tension between technological innovation and institutional lag, platforms should act as "ecosystem architects" and monitor activity, fairness, and security through an "ecosystem health dashboard." Effective models can be identified through market experimentation, laying the groundwork for institutionalization. During the integration stage, policy guidance and end-to-end collaboration should become the main drivers. As AI permeates the entire production chain and tensions shift toward the collaborative transformation of outcomes, platforms should move from unilateral control to pluralistic governance, expand into specialized applications such as music-based therapy and the digital preservation of intangible cultural heritage [8], and connect the value chain so that loosely organized collaboration becomes an institutionalized network. During the industrial empowerment stage, a mature model combining "AI, automation, and experts" should emerge. As the central challenge shifts toward developing system-level adaptive capacity, platforms should establish data-driven adaptive optimization mechanisms and follow a "platform + AI + ecosystem" pathway [10], creating a closed loop linking resource allocation, rule optimization, and risk alerts and transforming accumulated experience into self-learning capabilities.

The fundamental driver of the digital music innovation ecosystem's dynamic evolution is thus coordinated progress across multiple levels. Technology alone cannot resolve questions of value judgment; new consensus must be reached through interaction among multiple actors. Platforms should continually update their "ecosystem health dashboard" to incorporate diverse indicators, including fairness in the allocation of rights and cultural diversity, and promote a co-governance structure involving government, platforms, industry organizations, and creators. Through ongoing innovation in application scenarios and institutional adaptation, the digital music innovation ecosystem can move from "technological empowerment" to "shared ecosystem prosperity," creating a new environment in which technology and rights are both prioritized and commerce coexists with culture. This development may offer lessons for the sustainable development of the global digital content industry.

5. Conclusion

Taking Soda Music as its research object, this study used Actor-Network Theory to examine changes in actor relationships and the allocation of rights and interests following the integration of AI into digital music production. The findings showed that AI had shifted music production from a traditional model centered on a single human creator to a collaborative model involving multiple actors—"human–AI–platform." Through algorithmic rules and private contractual

arrangements, platforms intervened deeply in music production, rights determination, and revenue distribution, revealing the limited adaptability of allocation approaches centered on human creators and works. In response, this study proposed an allocation mechanism that shifts from a human-centered approach to human–machine collaboration, dynamically allocates rights and interests according to the actual participation of different actors in music production, and incorporates technological governance and humanistic values into an integrated framework. These proposals may improve the appropriateness and adaptability of rights-and-interests allocation in digital music and provide a reference for copyright governance and the allocation of rights in digital content in the AI era. A limitation of this study is its focus on a single platform. Further research should examine multiple platforms and different types of AI music production practices to test and refine the proposed allocation mechanisms.

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