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Article

Structural and Ethical Distinctions in Generative AI Music Production: A Comparative Analysis of Human Creative Processes and Algorithmic Systems

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Abstract

This paper examines structural differences between human creative workflows and generative AI music systems by synthesizing observations from prior work in creative cognition, AI ethics, and platform studies. The comparison focuses on variations in process visibility, transparency, and production scale, which may influence how authorship, provenance, and cultural value are interpreted in digital music environments. The analysis does not attempt to assess aesthetic quality or introduce new theoretical constructs. Instead, it summarizes descriptive patterns identified across existing literature. The findings suggest that high-volume generative output, combined with limited process transparency, may share surface-level characteristics with patterns noted in prior information-asymmetry literature, but the alignment is not assumed beyond descriptive similarity. The study aims to provide reference points for understanding how generative tools operate alongside human creative practices and how these structural characteristics may inform future discussions about digital creative ecosystems.

Keywords: generative AI; music production; creative processes; algorithmic systems; ethical considerations; information asymmetry; structural analysis; human–AI comparison

1. Introduction

The rapid spread of generative music systems—combining large language models, diffusion-based audio synthesis, and automated publishing tools—has drawn increased attention to how algorithmic production relates to established musical practices. While these systems can generate stylistically coherent audio at scale, the processes through which outputs are produced remain largely opaque, and the provenance of specific aesthetic decisions is often difficult to identify. These developments have led to growing interest in understanding where human creative processes and high-volume generative workflows align and where they diverge.

Existing discussions frequently, though not universally, treat human creation and algorithmic generation as interchangeable categories, emphasizing surface-level stylistic similarity while giving limited attention to underlying workflows. Prior research in creative cognition has noted that human creative work typically involves iterative modification, reflective decision-making, and sensitivity to contextual constraints. By contrast, algorithmic systems rely on stochastic sampling procedures and probabilistic modeling that do not expose intermediate decision pathways to the user. These differences do not indicate superiority of one mode over the other but suggest that each operates through distinct forms of structure and interpretability.

Because of this operational distinction, questions have emerged regarding authorship, attribution, and how creative labor is signaled within digital platforms. In particular, the coexistence of intentional human workflows and automated generative pipelines has prompted continued discussion about how provenance, transparency, and responsibility should be understood in algorithmically mediated environments. Rather than framing these issues as normative or

prescriptive, this study examines how observable differences in workflow structure may contribute to variations in cultural interpretation and economic signaling.

The goal of this paper is to provide a clear, descriptive account of such differences without proposing new theoretical constructs or evaluative hierarchies. The analysis synthesizes findings across creative-process research, AI ethics, and platform studies to clarify how structural features of human and algorithmic production may influence how music is attributed, interpreted, and circulated within contemporary digital ecosystems.

2. Methods

This study employs a qualitative comparative analysis to examine how human creative workflows and generative AI music systems differ in structure, transparency, and interpretability. The approach remains descriptive rather than normative, and the analysis is limited to established definitions used in prior studies. Instead, it synthesizes existing concepts from creative-process research, AI ethics, and platform studies to analyze observable features of each production mode.

The analysis draws on three sources of evidence.

First, prior literature in creative cognition is used to characterize documented elements of human creative practice, including iterative refinement, contextual evaluation, and reflective decision-making. These characteristics provide reference points for describing contrasts with algorithmic workflows.

Second, publicly available information about generative systems—including model documentation, interface behavior, and output characteristics—is used to identify structural features of algorithmic production, such as stochastic sampling procedures and limited visibility into intermediate decision stages.

Third, platform-level patterns reported in existing research are incorporated to contextualize how high-volume generative music channels operate within digital distribution environments.

The comparison focuses on structural and procedural attributes rather than aesthetic evaluation or quality assessment. To maintain descriptive neutrality, the study does not infer intention or agency on behalf of generative systems and does not evaluate the artistic merit of specific works. Instead, the method isolates differences related to workflow visibility, provenance clarity, cost structure, and the presence or absence of process-based decision traces.

This approach aims to provide a clear account of how variations in production structure may contribute to differing interpretations of authorship, attribution, and cultural value. All observations are grounded in existing scholarship and publicly documented system behavior, without speculation about internal model states or claims about unobservable mechanisms. The analysis does not claim exhaustiveness, and the comparative criteria remain limited to publicly accessible sources available at the time of writing.

3. Related Work

Research on human creative processes has long emphasized the role of intentional decision-making and iterative refinement. Foundational work in creative cognition identifies creative practice as a sequence of preparation, exploration, revision, and evaluation, with each stage involving context-sensitive judgments and reflective adjustment (Sawyer, 2000; Lubart, 2001). Studies of creative agency further highlight the interaction between the creator, the audience, and the surrounding environment, suggesting that creative outputs reflect both individual intention and socially embedded interpretation (Glăveanu, 2013). These perspectives provide a baseline for understanding how human creative workflows have been traditionally conceptualized in cognitive and cultural research.

Related research on algorithmic and AI-assisted music production has examined the technical and ethical implications of generative systems. Prior literature has discussed the difficulty of attributing responsibility within systems whose internal procedures are probabilistic and opaque,

raising questions about provenance, authorship, and interpretability (Floridi & Sanders, 2004). In music-related contexts, work in AI and MIR ethics has noted that automated generative tools may influence stylistic convergence and reduce visibility into the sources of training material, though findings vary across domains (Holzapfel et al., 2018; Sturm et al., 2019). Studies of user–system interaction have also observed that generative interfaces can shift the creator’s role from iterative composition toward selection and curation, altering the perceived nature of musical authorship (Morreale, 2021).

In the broader context of digital platforms, scholarship has examined how large catalogues, low marginal costs, and recommendation systems shape cultural visibility. Research on information asymmetry suggests that environments with limited transparency about production processes may influence how audiences evaluate quality and provenance (Akerlof, 1970). Platform studies have shown that algorithmic ranking and large-scale distribution can affect how music circulates, including the emergence of high-volume channels that optimize for search visibility or playlist inclusion (Prey, 2020; Nieborg & Poell, 2018). These dynamics are relevant for understanding how generative systems might operate within digital ecosystems where volume, discoverability, and metadata structures influence audience interpretation.

Together, these strands of literature provide a foundation for examining structural and procedural differences in contemporary music production. The present study does not propose new theoretical explanations but draws on existing research to frame a descriptive comparison of human creative workflows and generative systems.

4. Results

The comparative analysis identifies three recurring distinctions between human creative workflows and generative AI music systems. These distinctions do not imply evaluative judgments about artistic quality but describe observable structural differences grounded in existing literature and documented system behavior.

4.1. Process Visibility and Intentional Structure

Human creative workflows commonly exhibit traces of iterative revision, goal-directed adjustment, and context-aware decision-making. These characteristics are well documented in studies of creative cognition and artistic practice. In contrast, generative systems typically produce audio outputs through probabilistic sampling procedures that do not reveal intermediate decision stages. Users receive a finalized result without direct visibility into how particular musical elements were selected or shaped. This difference in process visibility suggests that human-created works and generative outputs may encode different forms of traceable structure, particularly in relation to intentional modulation and adaptive refinement.

4.2. Transparency and Responsibility Pathways

Across the sources examined, human creative processes generally maintain identifiable authorship lines: the creator is linked to specific decisions, revisions, and contextual interpretations. Prior research in AI ethics has noted that generative systems may provide more limited pathways for attributing responsibility, as the mechanisms driving the output are not fully accessible to users. The analysis indicates that this distinction may contribute to differing expectations about provenance and interpretability. It also aligns with previously reported observations that automated systems can blur the relationship between operator input and resulting content, especially when intermediate states are not exposed.

4.3. Production Scale and Platform Dynamics

Studies of digital music distribution highlight that low marginal costs and platform-driven discoverability can influence how content circulates. Human creative production typically incurs

time, labor, and opportunity costs that constrain volume and establish a specific tempo of output. Generative systems, by contrast, exhibit the capacity for high-volume production with minimal incremental cost, and this characteristic aligns with patterns reported in research on platform optimization and information asymmetry. While these patterns vary across contexts, the comparison suggests that differences in output scale and metadata structure may affect how works are indexed, surfaced, and interpreted within digital environments.

Taken together, these results highlight procedural distinctions related to visibility, transparency, and scale. The findings derive from observable system behavior and prior literature rather than from theoretical assumptions about agency or intention. They provide a descriptive basis for the subsequent discussion on how these structural features may influence authorship, attribution, and cultural appraisal in contemporary music ecosystems.

5. Discussion

The distinctions observed in this analysis—particularly those relating to process visibility, inference transparency, and production scale—suggest that human creative workflows and generative systems reflect different structural conditions within digital cultural environments. These observations do not propose normative evaluations or theoretical claims; instead, they summarize descriptive patterns that appear across existing research in creative cognition, AI ethics, and platform studies. The discussion below outlines how these structural characteristics relate to questions of agency, responsibility, and economic interpretation.

5.1. Structural Differences and Interpretive Contexts

The comparison indicates that human creative activity often develops through iterative decision-making, contextual understanding, and adjustments informed by experiential knowledge. Generative systems, by contrast, rely on probabilistic inference over large training distributions, producing outputs without exposing intermediate decision sequences or interpretive steps. This distinction does not imply superiority of one mode over the other but suggests that each embodies different forms of structure. These differences may shape how audiences interpret provenance, intention, and authorship in digital environments.

5.2. Transparency and Responsibility Pathways

Research in AI ethics has noted that transparency influences how responsibility can be attributed. Human creative processes typically provide identifiable links between decisions and outcomes, allowing observers to trace aspects of authorship. Generative workflows, however, reveal fewer internal mechanisms, and users may have limited insight into how model architecture, training data, or prompt structure contribute to the final output. This analysis suggests that variations in transparency may contribute to differences in how responsibility, authorship, and source attribution are understood across production modes.

5.3. Production Scale and Market Signaling

Economic literature has highlighted that environments characterized by low marginal production costs and information asymmetries can alter how cultural goods are valued. The present findings are consistent with studies suggesting that large-scale generative output and limited visibility into production processes may complicate how audiences distinguish between modes of creation. These dynamics do not constitute an assessment of artistic or aesthetic quality. Rather, they identify conditions under which market signals may be shaped by the structural characteristics of generative systems and platform distribution mechanisms.

5.4. *Process Documentation and Cultural Interpretation*

Several prior studies have proposed that documentation of creative processes—such as drafts, revision histories, or workflow records—may assist in clarifying provenance in digital contexts. While this paper does not introduce a formal framework or make prescriptive recommendations, the analysis indicates that increased process visibility can help differentiate between human creative workflows and generative pipelines. Such documentation practices may support clearer audience interpretation and allow both modes of production to function within cultural ecosystems without requiring normative judgments about their relative value.

6. **Conclusions**

This study compared structural characteristics of human creative workflows and generative AI music systems using insights from prior research in creative cognition, AI ethics, and platform studies. The observations highlight differences in process visibility, transparency, and production scale, suggesting that these factors may influence how authorship, provenance, and cultural value are interpreted within contemporary digital music environments.

The findings do not introduce new theoretical constructs or normative claims regarding artistic quality. Instead, they summarize patterns identified across existing literature and describe how variations in workflow structure—such as iterative decision-making, responsibility attribution, and the capacity for high-volume output—may shape audience interpretation and platform categorization.

As generative tools continue to expand in accessibility and technical capability, practices that document aspects of creative provenance may support clearer distinctions between production modes. Future work may examine how such practices are adopted in different communities, how they relate to platform policies, and how creative norms evolve when human and algorithmic processes operate alongside one another. The present analysis aims to provide a descriptive reference point for these broader discussions by outlining structural features that are already observable in current music production systems.

Author Note — AI Assistance Statement: Large language models (ChatGPT and Gemini) were used for minor linguistic refinement and formatting. All conceptual framing, analytical distinctions, case selection, and interpretive decisions were developed by the author. No part of the analysis or claims in this manuscript was generated autonomously by AI systems.

Appendix A. Summary of Comparative Criteria

This appendix provides a brief summary of the descriptive criteria used in the comparative analysis.

These criteria are drawn from existing literature and publicly documented system behavior. No proprietary data, system internals, or undocumented model information were used.

A.1. *Human Creative Workflows*

- Iterative revision traces
- Contextual decision-making
- Visibility of intermediate states
- Attribution pathways linked to identifiable agents

A.2. *Generative System Characteristics*

- Probabilistic sampling procedures
- Limited user-level access to intermediate decisions
- High-volume output capacity at low marginal cost
- Metadata structures influenced by platform distribution norms

A.3. Platform-Level Dynamics

- Information asymmetry in large catalogues
- Recommendation-driven discoverability
- Variations in the signaling of provenance and authorship

Appendix B. Limitations

This study relies on publicly available information, prior research, and observable system behavior.

It does not attempt to infer internal model operations, evaluate aesthetic quality, or propose new theoretical mechanisms.

The findings should be interpreted as descriptive observations rather than prescriptive conclusions.

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