

Artificial Intelligence and the Transformation of Film Production: Integrating Workflow Innovation, Business Value, and Artistic Expression

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Abstract. Artificial intelligence (AI) is increasingly involved in the film and television industry, and the relationship between process innovation, commercial value, and artistic value is worth exploring. As generative AI models and computer vision mature, the industry is transitioning from the "digital era" to the "intelligent era." This paper addresses the following questions: How does AI reconstruct the production chain and organizational structures of film and television? In addition to cost reduction and efficiency improvement, how does AI create new business models and market opportunities? How does AI participation in creative work reshape the core of artistic value and its evaluative standards? And are these dimensions—process, business, and art—driven in a linear fashion, or do they interact in complex and sometimes contradictory ways? Employing literature review, case studies, and expert interviews, this paper seeks to reveal the multidimensional impact of AI on the film and television industry and proposes implications for enterprise strategy and cultural governance.

Keywords: Artificial intelligence, business model innovation, media economics, virtual production, creative industries

1. Introduction

Over the past decades, the digital transformation of the film and television industry has primarily centered on the improvement of production tools and the diversification of distribution channels [1,2]. The proliferation of non-linear editing systems and the rise of streaming platforms accelerated the industrialization of film production. However, the industry has continued to rely on a highly segmented, labor-intensive, and cost-intensive production model. Today, with the rapid rise of artificial intelligence technologies, the industry faces a profound structural transformation. AI is no longer merely a supplementary tool; it is increasingly involved in creative generation, decision-making, and distribution processes, with the potential to reshape both organizational forms and value systems.

Against this backdrop, this study investigates the following research questions: How is AI reshaping production processes in film and television? In what ways does it influence the industry's business logic and its interactions with capital markets? And what are the opportunities and risks for

artistic value in an AI-mediated creative environment? To address these questions, the study combines literature analysis, case-based inquiry, and interdisciplinary comparison. Drawing on domestic and international research as well as representative industry cases—including Netflix, Disney, *The Mandalorian*, and *Frozen II*—the analysis highlights how AI redefines workflows and simultaneously generates commercial and artistic consequences.

2. Ai-driven process innovation: from linear chains to intelligent networks

For decades, film and television production has relied on a highly segmented and linear workflow. In the pre-production stage, screenwriters focused on script development, storyboard artists drafted visual scripts, and producers were responsible for estimating overall production costs. Further division was made in post-production, such as editing, sound design, and visual effects. This "assembly-line" division guaranteed homogeneous outputs and promoted film production industrialization in countries like China. However, it also caused structural inefficiencies: long production cycles, heavy dependence on human labor, high time cost, and limited fault tolerance. A single problem in any link often triggered costly redo, resulting not only in economic losses but also reputational losses and coordination breakdowns among departments. These characteristics—high input, high risk, and low fault tolerance—ultimately made it less attractive to invest. AI can greatly improve the following workflow.

2.1. Pre-production: from support tool to risk simulation

AI is not a "auxiliary tool", but it participates more and more in creative work and evaluation. Large language models can analyze narrative structures, character relationships, and rhythm curves, and have capabilities in combining market data to predict the commercial potential of a script. Netflix, for example, has used "AI-driven script analysis" to analyze character development and story arcs and decide which scripts should continue to the production stage [3]. Klover.ai also mentioned that AI can analyze dialogue complexity, pacing, and character design to estimate the marketization level of a script [4]. In short, these models are used for "risk pre-visualization," and eliminate projects with high before filming. In addition, with the support of image and video generation tools based on AI, one can quickly produce posters, character concept drafts, and even initial storyboards, which will shorten the time of pre-visualization and reduce labor and trial-and-error costs.

2.2. Production: virtual sets and real-time rendering

On the production side, breakthroughs in virtual production and real-time rendering are gradually displacing traditional on-location shooting and set construction. In *The Mandalorian* (Season 1), more than half of the scenes were filmed under the StageCraft virtual production system, cutting location shooting by more than half [5]. This led to a marked decrease in costs related to set design, travel, and logistics, as well as risks associated with uncontrollable external factors such as geography and weather [6]. Furthermore, production efficiency was improved through real-time adjustments and immersive visualization on set.

2.3. Post-production: from automation to creative enhancement

On the post-production side, this is one of the most evident application areas for AI, where automation and creative enhancement converge. In editing, automated identification of optimal takes, completion of preliminary rough cuts, and classification of footage can significantly reduce

repetitious work, allowing editors to focus on narrative flow and pacing. Many professional editing software, such as Adobe Premiere, now feature AI-related functions enabled by Sensei AI, and DaVinci Resolve also has similar functions. In visual effects and compositing, given the complexity and diversity of visual effects and compositing tasks, AI-driven simulation tools can generate target environments and dynamic phenomena—ranging from natural disasters and smoke to digital crowds—that require massive manual modeling and rendering work. For example, in producing *Frozen II*, Disney Animation used its own developed "Swoop" tool to simulate the interaction between the Wind Spirit and Nokk and other characters with snow, ice, and water, greatly shortening the rendering feedback process and reducing manual time-consuming adjustments [7]. In addition, AI has also been applied to sound production, particularly in voice synthesis and restoration. The documentary *Roadrunner: A Film About Anthony Bourdain* used AI-based voice cloning technology to re-create the voice of the late chef and allow him to read texts he had not read beforehand, enabling director Morgan Neville to recreate Bourdain's voice and have him narrate his previously unseen texts. Although this practice sparked controversy over ethical issues such as consent and authenticity, it also showed that using this technology could lead to significant cost savings, reducing the need for re-recording and improving sound quality [8]. All these examples show that, in addition to being an auxiliary tool, AI is increasingly becoming an indispensable part of post-production, changing the temporal and financial relationships of post-production in the filmmaking process.

2.4. Organizational transformation: toward leaner and hybrid teams

From the perspective of organizations, apart from technical changes, the transformation brought about by AI also manifests in changes to team organizations. Traditional film projects typically involve hundreds, if not thousands, of people working in dozens of professional categories. With AI integration, many repetitive positions are streamlined, technical roles gain efficiency, and teams increasingly adopt a "lean and agile" form. Directors and producers assume expanded responsibilities, as they directly interact with AI-generated outputs, combining creative, managerial, and supervisory functions. At the same time, new roles have emerged—such as AI trainers and model supervisors—serving as critical bridges in human-machine collaboration.

Nevertheless, process innovation is not a panacea. On the side of creators, while reducing trial-and-error costs, AI also brings the risk of "aesthetic homogenization." Images generated by algorithms lack the spontaneity, arbitrariness, and "imperfections" that create aesthetic uniqueness. Whether AI has true "aesthetic judgment" and whether the works produced by it can represent true aesthetic value remains to be seen.

In total, the use of AI for workflow innovation is a two-sided coin. On the one hand, it is a panacea that creates new forms of efficiency and opens up cost savings as well as new forms of investment logic. On the other, it is anathema to artistic individuality and creative subjectivity. The question is not whether AI should be used, but how it is used to realize cost savings without undermining artistic value.

3. AI reshaping business value: efficiency gains and model innovation

Innovation in the value logic of the film and television industry is not restricted to the technological level on the production side; rather, it manifests itself more profoundly in changing economic logic and business models of the industry as a whole. Film production is still regarded as a business with high capital and high risk levels, which makes the industry an unstable and unattractive form of

investment. In contrast, AI is changing this logic by making clear cost reductions and efficiency gains evident, as well as opening up new forms of value creation. In this sense, process innovation is increasingly translated into capital logic, as improvements in production directly affect investment interest and profitability.

3.1. Internal efficiency and cost optimization

Within the production process itself, AI has generated improvements in terms of efficiency and cost structure. Resource-consuming stages such as set construction, location shooting, and manual post-production are being optimized by means of automation and simulation. A notable example is Netflix's use of generative AI in its original series *El Eternauta*, where AI was deployed to generate scenes of urban destruction. Reports suggest that this process was ten times faster than conventional visual effects workflows and would have been prohibitively expensive under traditional methods [9]. Similarly, industry analyses indicate that adopting virtual production and real-time rendering technologies can reduce production costs by 30%-40% compared with traditional location-based shoots, particularly in areas such as set building, travel, and post-production adjustments [10]. These changes not only reduce waste, but also enable the production of smaller budget films with the same level of visual quality as before, thus creating more investment opportunities overall.

3.2. External market value and revenue innovation

Beyond internal cost efficiency, AI also generates value on the side of the production business toward the market. One source of value generation is improving retention and personalization of users. Netflix's recommendation system, driven by machine learning, analyzes individual viewing habits to deliver customized content suggestions. According to industry estimates, this system saves the company approximately USD 1 billion annually by reducing subscriber churn [11]. While such savings are not realized in direct production costs, they enhance revenue stability and improve the predictability of cash flows, which is especially significant for capital markets. Another avenue lies in extending the lifecycle of content assets. AI-enabled video restoration and upscaling technologies can upgrade classic films into 4K or 8K formats at lower costs than manual restoration, reintroducing them into circulation and generating secondary or even tertiary revenues [12]. This transformation signifies a shift from treating content assets as "one-off consumables" to viewing them as "sustainably reusable assets," substantially extending the investment return cycle of a single work. In addition, the emergence of new formats—such as micro-dramas, interactive storytelling, and virtual IPs—enables film and television companies to enter new markets with lower costs and shorter production cycles. Rather than relying solely on the high box-office revenue of individual titles, these models operate on an "internet-like logic" of scalable replication, where rapid experimentation and small-scale investments collectively yield more stable returns for capital.

3.3. Capital logic and portfolio effects

From the perspective of capital markets, these organizational and business transformations are particularly attractive. Leaner teams, enabled by automated production through AI, reduce fixed costs, while centralized decision-making processes accelerate projects and enable companies to finish more projects overall, thus improving capital turnover. For investors, this means an improvement in ROI per individual project as well as risk spreading through a diversified portfolio of projects. In essence, AI enables a concentration on a limited number of high-risk projects to be

replaced by a more diffuse and spread risk across a larger number of projects. This logic is more in line with what is expected by financial markets, as efficiency, scalability, and diversification are mechanisms that maintain and ensure returns.

4. The interaction of process, business, and art: an integrated business perspective

4.1. Process innovation as the foundation

As mentioned above, process innovation is the material basis upon which business value and artistic exploration can develop. AI enabled tools such as script analysis, virtual production, and automated editing have changed the workflow of the film industry from a fixed linear chain into an intelligent network. This reduces trial-and-error costs and improves overall efficiency. By lowering the financial and temporal costs of experimentation, the optimization of production processes reduces the financial and temporal costs of experimentation, thus enabling the creative team to try more experimental or explorative projects within the available financial and temporal limits. In this sense, technological advancement in production processes is not a means to an end, but the underlying infrastructure of industry transformation.

4.2. Business value as a driving force

On top of these process changes, business logic emerges as the key driver of industry change. Capital markets are inherently attracted to efficiency gains and new growth opportunities. Once the cost-saving and efficiency gains from AI use are proven in practical cases, investors will be more willing to invest in projects using AI and channel more resources into practical use cases of AI. Such influx of capital support further technological research and development expenditure as well as accelerate industry reconfiguration.

However, commercial success does not always align with artistic value. In order to achieve a fast return, investors and platforms may allocate more resources to those formats that are easy to produce and consume in the short term, such as micro-dramas or interactive dramas, and neglect projects with higher artistic ambitions but higher financial risks. Thus, while commercial incentives do drive technological use, they may also confine the space for artistic innovation.

4.3. Artistic value as the core balance

Despite these commercial pressures, artistic value remains the ultimate source of cultural significance and competitive differentiation for any film and television product. Without any aesthetic uniqueness and emotional resonance, even highly efficient commercialized AI products may turn into a large number of similar commodities with limited brand power. In turn, AI exerts a dual influence on artistic innovation: it reduces the cost of experimentation and expands the creative space, but also increases the risk of algorithmic homogenization, potentially eroding individual artistic style. Furthermore, the audience reception towards AI products remains polarized. While some are open to the new technology, others refuse to accept works produced by machines. This uncertainty highlights the importance of protecting artistic autonomy in intelligent production.

4.4. Strategic implications

For film enterprises, the challenge lies in establishing a dynamic balance among process efficiency, business value, and artistic integrity. Not all projects are suited to the same degree of AI

intervention. Commercially driven projects can leverage AI to ensure cost control and predictable returns, whereas artistically oriented works may require a lighter touch to preserve creative freedom. Companies can adopt a "portfolio logic," using low-risk, high-return projects to maintain cash flow stability, while allocating part of their resources to experimental or prestige works that strengthen long-term brand identity. Institutional mechanisms—such as innovation funds for artistic projects or internal forums for critical debate—are equally important to avoid over-reliance on technological optimism.

In summary, AI does not replace the process, business, or artistic dimensions of filmmaking. Process innovation exerts a structural foundation role, business logic channels resource allocation, and artistic value confers cultural significance and brand power. The future competitiveness of the film industry in the intelligent production era will depend on how companies can balance efficiency, profit and creativity.

5. Conclusion

This article analyzed the impact of artificial intelligence on the film and television industry from three interconnected perspectives: process innovation, business value and artistic integrity. The analysis shows that artificial intelligence should not be treated as a set of technical tools, but rather as a strategic variable that changes the structural relationship between the industry.

At the process level, AI's contribution to the industry can be understood as the conversion of a linear production chain into a more flexible and intelligent network. In terms of production efficiency, AI's contribution is materialized in the reduction of production risks, costs, and cycles through applications in script analysis, virtual production, automatic editing, and visual effects. These efficiencies provide the basis for more experimental and creative endeavors.

At the business level, AI converts production efficiencies into economic outcomes. By reducing costs, expanding feasibility, and extending content life cycles, AI increases return on investment and strengthens confidence from investors. In addition, the emergence of new market models—such as micro-dramas, interactive storytelling, and cross-industry IP extensions—generate diversified revenues, making the industry less susceptible to market fluctuations.

At the artistic level, AI provides both opportunities and risks. While it opens up new possibilities and popularizes access to high-level production methods, it also raises concerns about homogenization and the dilution of individual expression. Audiences are also split on its impact, with some questioning the authenticity of intelligent media and the role of human beings in creating artistic images.

In sum, the above findings indicate that the sustainable development of the film and television industry in the AI era lies in balancing efficiency, profitability, and creativity. Enterprises need to construct a strategy that recognizes the dual nature of AI: as both a promoter of economic success and a constraint on artistic expression. Future competition will not only depend on how well enterprises apply AI, but more on how well they can cultivate an appropriate environment for process optimization, commercial success, and creativity in the AI era to coexist in a state of constant tension.

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