

Analysis of the Application and Business Models of Artificial Intelligence in Streaming Platforms — A Case Study of Netflix

Weina Liu

*Department of Economics, College of Arts & Sciences, University of Washington, Seattle, USA
elainaliu0404@gmail.com*

Abstract. With the rapid evolution and wide adoption of digital technologies, including artificial intelligence and big data, streaming platforms like Netflix have officially moved beyond traditional digital media business models and entered a new phase of intelligent, targeted media development. The key focus of both industry practice and academic research today is how to leverage artificial intelligence to drive industrial upgrading and efficiently transform user value, content value and commercial value. This paper utilizes literature review and case study methods, focusing on Netflix—a global leader in the streaming industry—as the central case study. It provides a systematic exploration of the business model innovation pathways and core value creation logic for streaming platforms in the era of intelligent media. Additionally, by examining the application characteristics of AI technology, the study identifies various potential risks and industry challenges arising during technology implementation, such as data security, algorithmic bias, content homogenization, and proposes targeted, scientifically sound and feasible optimization strategies. This study systematically clarifies the evolutionary characteristics and developmental patterns of AI-driven business models in the streaming industry, addresses gaps in existing research, and provides effective theoretical references and practical insights to support the intelligent, standardized, and high-quality healthy development of the streaming industry.

Keywords: Streaming platforms, Artificial intelligence, Data elements, Digital business, Case study method

1. Introduction

After undergoing multiple rounds of technological development, artificial intelligence has now entered the era of large language models, profoundly transforming business operations and everyday lives. The streaming industry has been particularly affected by this trend. Streaming platforms, exemplified by Netflix, are leveraging AI to upgrade from digital to intelligent systems, with new technologies reshaping existing business models. How to leverage intelligent technologies to build a human-machine collaborative ecosystem and achieve commercial monetization has become a key issue for the industry's development, and there is already a wealth of relevant research findings both domestically and internationally.

This paper adopts a research methodology combining literature review and case analysis, using Netflix as the subject of study to analyze the business models, value creation pathways, and risk management strategies of streaming platforms in the era of intelligent media. The study is divided into two main parts: first, it combines technical theory with industry case studies to trace the evolution of streaming business models and value creation; second, from a technological ethics perspective, it summarizes the various risks arising from AI implementation and proposes governance measures.

This paper aims to map out the practical application pathways of artificial intelligence in the streaming industry, analyze how intelligent technologies are transforming platform business models, and propose feasible solutions to the various risks posed by these technologies.

2. Overview of streaming platforms and artificial intelligence technologies

2.1. The concept and characteristics of streaming media platforms

Streaming media refers to a technology and process in which a series of multimedia files is compressed and transmitted in real time over the Internet in segments, allowing users to view content without waiting for the download to complete. As a new form of media transmission, streaming has completely transformed the landscape of the media industry, profoundly influencing content distribution and consumption models, and has become a core technological pillar of media services in the Internet era [1]. Relying on network effects, streaming platforms have developed quickly and become a key part of the digital economy.

Streaming platforms lower the threshold for content creation and support individual creators and small production teams. With growing industry competition, major platforms have shifted from content distribution to self-production, as high-quality exclusive content is critical for user retention. China's streaming market is mainly occupied by iQIYI, Bilibili, Tencent Video, Youku and Mango TV; the total user base of mainstream platforms had approached 1 billion by March 2025 [2]. Relevant data analysis shows that China's video streaming market is projected to reach \$29.56 billion by 2030, with a compound annual growth rate (CAGR) of 21.9% from 2025 to 2030 [3]. Worldwide, platforms such as YouTube, Netflix, Hulu, Disney+, HBO Max and Amazon Prime lead the market [4]. By 2025, YouTube had over 2.5 billion global users; Amazon Prime served more than 200 countries with over 200 million members; and Netflix had more than 270 million paid subscribers in over 190 countries and regions.

To strengthen market competitiveness, streaming platforms adopt differentiated operational strategies. First, they adhere to the core development strategy of "content is king," placing content at the center and continuously innovating to produce high-quality content that maintains user interest and loyalty [5]. Second, technology empowers content production and distribution, and the combination of technology and content determines platform competitiveness. As core technical support, algorithms assist data-based content creation, content selection and multi-channel distribution, greatly improving content delivery efficiency. Third, platforms balance advertising and subscription services to diversify income and satisfy different user groups. Fourth, they focus on user experience and improve platform interactivity through shopping links, online voting, quizzes and game functions.

2.2. Technical concepts of Artificial Intelligence

Artificial Intelligence (AI) is a field of computer science that simulates and extends human intelligence. The field of AI was formally established at the Dartmouth Conference in 1950. Its development has progressed through three stages: the early symbolic stage, which relied on fixed rules; the multi-layer network stage, based on deep learning; and the generative AI stage, which emerged after 2012.

Generative AI can learn from existing text, image, audio, and video data to autonomously generate entirely new content; computing power, algorithms, and data are the three cornerstones of its development. Mainstream generative models include four categories: generative adversarial networks (GANs), variational autoencoders (VAEs), diffusion models, and autoregressive models.

Streaming platforms prioritize a balance between content, user experience, and business objectives, making them highly compatible with AI technology; generative AI is also driving a comprehensive intelligent transformation of the streaming industry.

3. Analysis of AI technology applications in the streaming platform sector

Since the wave of generative AI began in 2022, the AI sector has experienced exponential growth worldwide. With the continuous emergence of large-scale models, such as ChatGPT, Gemini, DeepSeek, Calude and Qianwen, processing capabilities in cross-text and multimodal domains have been further enhanced, gradually forming a multi-tiered, differentiated product matrix. Developments in the AI field have attracted significant attention across all industries, particularly bringing an unprecedented impact to the audiovisual arts industry, spanning areas such as personalized recommendations, user experience optimization, content creation, advertising, and operations.

3.1. Personalized recommendations

As the invisible infrastructure of streaming platforms, recommendation systems serve as tools for identifying and recommending content, products, and services that align with users' interests [6]. Optimizing data-driven content recommendation algorithms to boost content discoverability has become essential for platforms. As a global leading streaming platform, Netflix launched its "micro-genre" classification system in 2006. It developed exclusive video content tagging rules and the "altgenres" classification process to digitize, label and categorize film and television resources, realizing accurate content classification and personalized user recommendations. According to statistics, nearly 80% of views on Netflix stem from system recommendations [7]. Hulu creates hundreds of personalized trailers for different users and delivers targeted recommendations based on users' viewing records. Famous for personalized music recommendation services, Spotify generates exclusive playlists automatically according to users' listening habits and preferences. YouTube continuously optimizes its algorithm logic based on user behavior data, helping users explore various video contents and improving user stickiness. TikTok adopts a three-tier recommendation framework of "retrieval–ranking–reordering" and applies large language models to upgrade its service from "passive recommendations" to "active guidance" [8].

3.2. User experience optimization

Strong user retention is the most critical competitive advantage for streaming platforms. High-quality original content, a rich content library, smooth video playback, and interactive user services are key to continuously optimizing the user experience. The introduction and application of advanced technologies, such as High Dynamic Range (HDR) video and surround sound, not only significantly improve video streaming quality and loading speeds but also enhance media playback stability. Netflix relies on an AI- and big data-driven decision-making system to flexibly identify and adaptively utilize environmental information, thereby continuously optimizing delivery quality. YouTube launched "Jump Ahead," which allows users to skip directly to the parts of a video that interest them most; it also integrated the Verbit automatic speech recognition system into its live streaming feature to generate real-time captions, improving content delivery efficiency. HBO Max introduced the Vertex AI tool to enhance caption generation efficiency [9]. Strong interactivity has become the primary value proposition for streaming platforms. By incorporating technologies such as AR and VR to enable interactive shopping, video voting, quizzes, and games, platforms are enhancing interactivity to pioneer new user experiences.

3.3. Content creation

In the streaming industry, leading companies continue to adhere to the "content is king" development strategy, consistently producing high-quality content with a focus on content. Artificial intelligence technology offers new approaches to enhancing the diversity, immediacy, and creativity of content production. AI significantly reduces the production costs of film and television content and shortens production cycles. Leveraging large generative models for text, images, audio, and video, creators can rapidly produce scripts, virtual characters, and special effects scenes.

Half of the animation scenes in Netflix's animated short *The Dog and the Boy* were created using AI; the sci-fi series *The Eternal Voyager* used AI to quickly produce large-scale collapse effects, increasing production efficiency tenfold; the overseas platform Showrunner used AI assistance throughout the entire production process of its animated short series, significantly lowering the barrier to entry for audiovisual content creation.

3.4. Advertising and operations

Personalized advertising serves as a key revenue source and a core differentiated strategy for streaming platforms. Platforms apply big data and artificial intelligence to deliver user-tailored ads based on individual preferences and behavioral patterns. Leading platforms such as Netflix, Amazon Prime, Tencent and iQIYI have grown their revenue by launching advertising services. Netflix targets users who frequently watch sci-fi content with relevant sci-fi product ads and adopts in-story placements to blend advertisements with original content and reduce viewing interruptions. HBO Max and other platforms conduct co-branding promotions to enable user brand engagement during video consumption. Disney integrates its multiple business segments via AI technology. When users watch *The Mandalorian* on its platform, the AI system recommends peripheral merchandise like Baby Yoda based on user behavioral data, realizing effective integration of content presentation and commercial conversion [10]. Furthermore, platforms adopt a hybrid business model of subscriptions and advertising to improve profitability, raising standard subscription prices while offering affordable ad-supported subscription plans.

4. Analysis of business models and value creation mechanisms: the case of Netflix

Whether in the digital media era replacing "physical discs" and "theatrical release schedules," or in the smart media era competing for "user time" and "subconscious influence," the core business model of streaming platforms is to explore and build service models that meet user needs and create value for users, thereby encouraging them to pay for that value.

4.1. The digital media era

The period from the 1990s to 2015 marked the digital media era, which transformed physical video disc viewing into online on-demand services. In the early stage, Netflix mainly operated online movie rentals, accumulated abundant film and television copyrights to build an online content library, and adopted basic collaborative filtering algorithms for simple content recommendations.

In this content inventory-driven subscription era, Netflix formed a core business model based on paid memberships and content libraries. Users paid monthly subscription fees for unlimited movie access, and the majority of subscription revenue was reinvested into content library expansion. At this stage, Netflix's income mainly came from membership fees, while its costs covered content procurement; platform operation and maintenance, and fixed expenditures, including staff salaries and office rents. Its value creation process included five key steps: building a large-scale content library, attracting paid subscribers, generating sustainable recurring revenue, expanding content resources to enhance platform competitiveness, and improving customer retention to stabilize and expand the user base. This value creation pathway also indicates that the core metric the company pursued was "growth in the number of subscribers" [11].

4.2. The era of smart media

After 2015, driven by the rapid development of big data, deep learning, 5G and IoT technologies, Netflix underwent digital and intelligent transformation, shifting its development focus from quantity to quality. Centering on user experience, Netflix has built a smart ecosystem to deliver innovative, targeted content services, solving user choice overload and competing for user time and long-term engagement. In the smart media era, Netflix sustained high technological investment to advance its content system. By adopting deep learning and collaborative filtering algorithms, it analyzes user data including viewing duration, completion rates, likes and comments to optimize user experience, realizing a crucial shift from "people finding shows" to "shows finding people."

In the user-focused smart ecosystem, Netflix relies on algorithmic user analysis to guide corporate investment and content production, forming a core business model based on personalized services and original content. Its revenue structure now covers subscription fees, advertising income and IP derivative revenue, while costs mainly include content production, technology R&D, global marketing and fixed expenditures. Such structural changes in revenue and costs have reshaped the platform's value creation paths. In the smart media era, Netflix creates value through data analysis-driven original content production, technology-empowered content upgrading, algorithm-based user and advertising matching, and model optimization for higher user viewing duration and retention, forming a sustainable user value lock-in effect. Correspondingly, its core operational evaluation indicators have shifted from subscription volume to user average revenue (ARPU), user engagement and profit margins [12].

Intelligent algorithms, including deep learning and generative AI, help streaming platforms solve traditional recommendation system pain points, such as user cold start and low matching accuracy.

Algorithm-powered precise content matching simplifies the platform's value delivery chain. Combined with AIGC content production and intelligent ad placement, it builds a win-win value creation ecosystem for platforms, creators and users, promoting the iterative upgrading of streaming business models and strengthening user-platform bonding. Nevertheless, the in-depth integration of AI in operational processes also brings inherent technical limitations and potential risks that cannot be ignored.

5. Risks arising from the application of smart technologies and regulatory strategies

Technology is a double-edged sword. While artificial intelligence brings new development opportunities to streaming platforms, it also gives rise to a series of potential risks and challenges, including ethical, intellectual property, and privacy issues.

5.1. Attention hijacking

Streaming platforms use algorithms to shape user tastes and connect users with similar tastes, thereby reinforcing group identity among different individuals. Subsequent content recommendations based on these tastes, while enhancing the user experience, also intensify the hijacking of user attention, leading to addiction and dependency. At the same time, taste shaping is highly prone to creating filter bubbles and ideological exclusion. The use of algorithms can lead to new forms of individual isolation rather than embracing diversity, resulting in algorithm-driven taste communities that further exacerbate the hijacking of user attention. To address this issue, service models based on technical algorithms must be further optimized to enhance the platform's objectivity and neutrality, fostering cultural and value-based resonance among users; content consumption models should also be optimized by introducing features, such as playback interruptions and content reminders at appropriate times to reduce attention hijacking.

5.2. Deepfakes and copyright infringement

AI technology application in the streaming industry depends on massive training data collected from films, TV series, variety shows, music and short videos. In addition, AI-generated content may involve unauthorized editing, compositing, face swapping and plot modification, as well as improper use of artists' portraits and voices. Ambiguous ownership of such content easily causes copyright infringement and deepfake problems, undermining market order and industrial development. To solve these challenges, the streaming industry needs to follow strict operational norms that respect copyright and originality from a regulatory perspective. Technically, it is necessary to establish advanced content review and AI quality inspection platforms to standardize content quality and elevate overall production standards.

5.3. User privacy breaches

To optimize recommendation effectiveness, platforms collect sensitive data such as user viewing history, geographic location, device information, and personal mobile phone numbers. Improper data handling can lead to privacy breaches and violations of relevant regulations. To address these issues, from a technical perspective, high-level encryption technologies, de-identification, and transparent privacy policies can be adopted to prevent data leaks during transmission and storage. From a management perspective, the scope of data collection must be further standardized, authorization methods clarified, and unified data management implemented.

5.4. Algorithmic black boxes and bias

Fierce market competition has further driven streaming platforms to continuously upgrade their content recommendation systems. While the application of new algorithms improves recommendation accuracy, it also leads to increasingly complex algorithms and reduced interpretability. These "black-box" algorithms can easily give rise to ethical challenges such as bias and discrimination. To address this issue, from a technical perspective, attention mechanisms can be introduced into algorithms to improve algorithmic models, highlighting key feature data as the basis for decision-making, and actively developing explainable algorithms [13]; from a management perspective, efforts should focus on simplifying the configuration and optimizing the processing of intelligent algorithms by breaking down complex models and prioritizing the use of simpler models for processing.

6. Conclusion

As a core driver of social development today, artificial intelligence (AI) technology is reshaping existing business models and value creation mechanisms. Particularly in the streaming media sector—which emphasizes "content-centric and user-focused" approaches—AI has become an integral part of modern streaming platforms. This study begins with the development of streaming platforms and AI technology to conduct an in-depth analysis of AI applications in the streaming media sector. We then selected Netflix, a leading streaming company, to compare the differences in the evolution of platform business models and value creation mechanisms between the digital media era and the smart media era. This analysis clarifies the logic behind how AI technology is reshaping the streaming business ecosystem. Concurrently, by exploring typical industry scenarios for the deployment of AI recommendation technologies, we dissect practical strategies that leverage intelligent algorithms to tackle longstanding industry pain points, including user cold-start challenges and precision content distribution. Furthermore, the double-edged nature of technology requires us to actively explore regulatory strategies to address the risks arising from the application of intelligent technologies.

Artificial intelligence has profoundly transformed Netflix's business model and marketing strategies and will continue to shape the future development of the digital entertainment industry. This study still has certain limitations; the breadth of data coverage across specific industry scenarios needs to be expanded. Future research could explore additional case studies of domestic and international streaming platforms to further deepen the analysis of AI's commercial implementation pathways and risk management.

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