

The Reconfiguration of the Film Industry in the Digital Age: A Case Study of Marvel and Legendary

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Abstract. Digital films are not a simple replacement of film technology, but a fundamental reconfiguration of the film medium. This article takes Marvel Studios and Legendary Pictures as case studies to examine the differentiated transformation paths and industrial effects of Hollywood studios in the digital wave. The research finds that Marvel has built a data-driven vertical collaborative system by relying on the "Marvel Cinematic Universe", achieving full-chain digital integration from content production to global distribution; while Legendary has used the "Monster Universe" as a carrier, focusing on exploring cross-cultural narrative adaptation and audience diversity strategies, forming a differentiated positioning. The two cases jointly reveal the continuous tension between digital technology empowerment and organizational inertia. Through comparative analysis, this article extracts universal inspirations for the reconfiguration of the film industry in the digital age and makes forward-looking judgments on the future image forms under the intervention of artificial intelligence and virtual production technologies.

Keywords: Digital films, Digital transformation, Marvel Studios, Legendary pictures, Film industry

1. Introduction

Digital cinema is not merely a replacement for the film medium; rather, it represents a systematic reconfiguration of the essence of cinema in the digital age. This transformation has not only given rise to entirely new audio-visual languages and production processes but has also profoundly altered the structure of the film industry and the new competition rules.

During the digitalization process in Hollywood, Marvel Studios and Legendary Pictures have presented two highly contrasting paths of transformation. Marvel, relying on the "Marvel Cinematic Universe" (MCU), has established a digital collaborative system that encompasses character interlinking, cross-media narrative, and global simultaneous release, achieving a closed-loop management of content production and fan engagement. Meanwhile, Legendary, with the "MonsterVerse" as its core, uses digital technology to create spectacular images while attempting to find a differentiated market positioning in the global market. However, there is always a tension between technological empowerment and organizational inertia. During their transformation processes, these two enterprises will also face various challenges and strategic adjustments, which constitute a typical sample for observing the evolution of the film industry in the digital age.

Based on the above analytical framework, this paper aims to compare the digital practices of Marvel and Legendary, analyze the underlying reasons, and then extract the core insights that have universal reference value for the industry. It also makes forward-looking discussions on the evolving direction of the new era of film forms.

2. Analysis of digital film and the digital transformation of marvel company

2.1. Definition of digital films

Digital films refer to films that utilize digital technology to replace traditional film processes during shooting, production, storage, and screening, and are presented in a form using digital media and transmitted via satellites or optical fibers. In simple terms, it refers to films that utilize digital technology throughout the entire production and distribution process [1]. Digital films emerged in the 1980s and are a product of high technology. With the rapid development of computer technology, many shots that traditional film production cannot achieve need to be completed with the help of computers, or the use of computer technology can make films more perfect. Thus, traditional films introduce digital technology. In June 1924, the earliest recorded digital film dream was proposed. George Fyfe from the UK first depicted the dream of digital films in the program. From January 1987 to February 1992, the technology of digital film projectors entered the early stage of development. From May 1992 to May 1997, it entered the early transmission and market trial stage of digital films. From the end of 1997 to June 1999, the digital projectors and transmission methods became increasingly mature, and digital films eventually entered the commercial screening stage.

2.2. Marvel's digital breakthrough path

Driven by the global digital wave, the film industry is undergoing a reconfiguration of digital films. As a benchmark of global superhero films, Marvel Studios, leveraging its advanced digital technologies and innovative applications, has embarked on a distinctive digital development path.

Firstly, Marvel Studios' most successful digital breakthrough path is AI assistance. Let's introduce how Marvel Studios integrates artificial intelligence deeply into the entire process of film creation, breaking the limitations of traditional film creation and forming a unique technological application model, which has become the core support for its digital breakthrough.

The first aspect is AI assisting in special effects production, solving the difficult problem of high-level visual presentation. Marvel films have been renowned worldwide for their grand cosmic settings and stunning special effects scenes, with the special effects scenes of a single film generally accounting for more than 80% of the total scenes. For example, in "Avengers: Infinity War", approximately 3,000 shots of the entire film, of which 2,900 are special effects shots, account for about 96% [2]. The successful application of AI technology has solved the problem of long processing time and high difficulty of traditional special effects. Marvel films collaborate with top special effects companies and apply AI technology to the rendering of special effects and character modeling, achieving efficient special effects production. For instance, in "Avengers: Endgame", the character "Thanos" was performed by Josh Brolin through motion capture technology, and AI technology played a key role in this process. Marvel relies on the Medusa facial capture system developed by the Disney Research Center, which can capture the rich micro-expressions of the actors in real time and convert them into precise facial expressions of CGI characters through deep

learning models. This technology enables digital characters to convey the same rich emotional layers as human faces, effectively solving the pain point of stiff emotions in traditional CGI characters.

The second is support for AI in character design and script-framework construction. Big data analysis and AI can provide data support for improving the personality setting and appearance optimisation of characters in a way that is more appealing to the audience [3]. AI can also help the writer come up with stories and build Easter eggs based on the narrative logic and style of old Marvel movies to produce high-quality works. For example, in the early stages of planning for "Spider-Man: Homecoming", Marvel used AI analysis tools to conduct sentiment analysis and theme exploration of the conversations in the global fan community. They found that the audience had very high expectations for "the multiverse" and "the return of classic villains". Therefore, the writing of the script was adjusted accordingly. For example, the production team would use some frequently occurring keywords to determine the creative direction and bring back some classic villain characters to meet the expectations of the audience and the requirements of the work.

Secondly, the second is to optimise the content production process of Marvel Studios and enhance its digital strategy. This optimisation will not just digitise the traditional steps; rather, by means of cloud computing, data platforms and remote-collaboration technologies, all geographical, temporal and departmental barriers will be broken down to create a global, real-time, data-driven "virtual studio".

Firstly, under the pressure of the pandemic, Marvel Studios fully implemented cloud collaboration, clearly demonstrating how its production process was optimized. Due to a series of challenges, such as the filming base being in Australia, director Dustin Curtis being in Los Angeles, and the main post-production and visual effects teams being located globally (including London, Vancouver, New Zealand, etc.), the pandemic led to almost a complete interruption of international travel. Therefore, Marvel Studios began to seek new breakthroughs and did not rely on a single platform but instead built an integrated cloud collaboration ecosystem. It mainly consists of the following key methods. One of them is that all shooting materials, visual effects previews, and concept drawings are uploaded to media asset management platforms such as Pix or Frame.io. Any production member of the global team can access, review, and add time-coded precise comments at any time, replacing the traditional offline viewing meetings and solving the problem of being unable to gather together for discussion and exploration during the pandemic. In the post-production aspect, Marvel Studios also has a relatively fast digitalization process. It integrates editing, special effects, dubbing, and color grading processes, achieving efficient collaboration in post-production. At the same time, it actively integrates emerging technologies such as VR and AR to enrich the expression forms of post-production and bring a more immersive visual experience to the audience.

Again, its diverse business model is another significant feature. Marvel Studios has established a diversified revenue-generating system, maximizing the monetization of its IP value. Although Marvel has expanded various revenue-generating channels, box office revenue remains one of its core sources of income. Marvel uses digital marketing methods to precisely capture the psychology of its target audience, and at the same time, leverages digital screening technologies to increase ticket prices and attendance rates in cinemas, further expanding its box office revenue. For example, before the release of "Avengers: Endgame", Marvel conducted multi-platform and all-round digital marketing promotion activities through various digital channels such as social media and streaming platforms: it launched a documentary series of the "Avengers" franchise on Disney+, awakening the fans' emotions. It also held various events such as pre-sales and premieres, and these digital marketing methods brought the global attention of the film to its peak. After its release, the global box office revenue exceeded 2.79 billion US dollars [4], making it the second highest-grossing film

in global film history. Secondly, Marvel, relying on its core IP of the MCU, through digital technology, expanded the categories and sales channels of IP derivative products. Its IP derivative products cover various categories such as toys, clothing, stationery, games, and digital products, and the sales channels include online e-commerce platforms, offline stores, social media, etc., forming an "online + offline" multi-platform derivative product sales system.

2.3. Challenges and adjustments in the transformation of marvel studios

During the transformation of Marvel Studios, it also encountered numerous challenges. The first challenge was the homogenization of content and lack of innovation, which intensified the fatigue of audience's aesthetic perception. With the continuous release of the fourth and fifth phases of the MCU content, the narrative patterns and character designs of Marvel films and series gradually showed homogenized characteristics - most themes centered around "superheroes saving the world" as the main thread, relying on grand special effects scenes to fill the plot, resulting in increasingly obvious fatigue in audience's aesthetic perception. At the same time, after the era of the original core heroes like "Iron Man" and "Captain America" passed, the character designs of the new generation of heroes were not sufficiently three-dimensional, the fan stickiness was insufficient, the reputations of some films and series declined, and even the box office performance failed to meet expectations, making it difficult to achieve further success.

The second problem was too much reliance on technology and an imbalance in creation, thus reducing the value of the content. Marvel Studios excessively employed AI special effects and digital production, etc. Some works fell into the trap of "emphasizing special effects and neglecting the plot", with loose plot logic and thin character emotions; they ignored the story and coherence of the content. Some viewers reported that although some of the special effect scenes were visually stunning, they lacked connection with the plot and were difficult to arouse emotions in the audience; thus, there was an imbalance between technological advancement and artistic expression, and it failed to meet the basic requirement of helping to tell the story of the film [5].

The last problem is that the complexity of inter-universe connections has risen and the management of materials is also more difficult. More than 30 movies and more than 10 TV shows have been released by the MCU. Many worlds have added more links among the content. The continuity of plots and consistency of settings in different works cannot be guaranteed, so there are some plot contradictions and setting conflicts that affect the viewing experience of the audience. At the same time, the coordination problem for the world's creative teams has also increased. Directors and writers of different films have different creative styles, and some of them may not fit in with the rest of the Marvel Cinematic Universe. The Problems of Content Management Continue to Increase.

3. The digital breakthrough and diversity of dissemination of Legendary Pictures

3.1. The digital breakthrough path of legendary pictures

In 2000, Thomas Tull established Legendary Pictures. First of all, there were some well-known commercial films produced in China that achieved success abroad, such as "Godzilla" (2014) and "Jurassic World" (2015). Its partners were the traditional theatrical distribution channels for Warner Bros. In the 2010s, with the spread and development of Internet technology, changes have been occurring in how films are distributed and consumed. Audiences started watching film clips, trailers and short video content on social platforms and mobile devices, so the way films are distributed has changed from a single box office model to a multi-channel revenue system.

Given the above changes, Legendary Pictures knew that the traditional model of theatrical release would no longer meet the demands of the new generation of movie-going public for media consumption. Therefore, it began to systematically build a digital film ecosystem by covering content production, distribution channels and digital marketing, gradually forming a digital strategy and promoting the transformation of a "pure production company" into a "digital ecosystem content institution".

The first aspect is digital content production. The core of this aspect is the technological-driven change in creative production methods. For instance, in the film "King Kong: Skull Island", Skull Island is the homeland of King Kong and also a paradise for monsters. It is worth noting that if people search for "Skull Island" on Google Maps, they will find that it actually exists in the South Pacific. The fictional island in the science fiction story appeared on Google Maps, which is the innovation of Legendary Pictures in content production. At the same time, to make the effect more significant, the place marked as an "archaeological site" has over 200 photos and nearly 8,000 comments.

The second aspect is the breakthrough path of distribution channels. During the pandemic, theatrical distribution suffered a severe impact. Legendary Pictures began to actively explore an issuance model that combines both theatrical and digital platforms. For example, when "Godzilla vs. King Kong" was released, the distribution model adopted was not only shown in global theaters but also available for same-day streaming on HBO Max. At the same time, the box office performance of "Godzilla vs. King Kong" on HBO Max and in theaters indicates that the bold strategy of simultaneously distributing on both the cinema and streaming platforms is working [6]. This "theatrical + streaming" dual-track distribution model has greatly expanded the audience coverage of the film, enabling viewers who cannot go to the cinema to watch the new film at home immediately.

3.2. The strategy and effectiveness of legendary pictures in promoting diversity

First of all, Legendary Pictures has expanded the types of films to include games, comics, short videos and online interactive content through the construction of a cross-media content ecosystem. Legendary Pictures has collaborated with Netflix to create several animated series based on its film universe for the field of animated short films. The first was "Skull Island", which served as a new chapter for the "Legendary Pictures Monster Universe Series of Films", and the other was the animated series "Tomb Raider" that continued the reboot trilogy of the "Tomb Raider" video game. Legendary Pictures and Warner Bros. launched cross-category retail for the "Mythical World Movie" in Australia and New Zealand in the area of related character merchandise. The goods included plush toys, clothes, shoes and other items. This cross-media ecosystem has prolonged the life of the brand's IP and increased fan loyalty. Interactive behaviours of the audience on various platforms have expanded the scope of consumption scenarios and generated abundant user behaviour data for Legendary Pictures to further optimise content production and marketing strategies. Second, Legendary Pictures has established a "fan co-creation" mechanism for social media fan interaction. "Godzilla vs. Kong", they can use special effects technology Kong, Legendary Pictures and the well-known fan artist Boss Logic have released official NFT digital works [7].

Additionally, Legendary Pictures also adopted user-generated content (UGC) marketing strategies by holding fan creation competitions and role-playing short film challenges, allowing fan-generated content to be shared by the official channels, thereby forming an ecosystem of "company content + user content collaborative dissemination". Finally, it is data driven. In the modern communication environment, big data has become an important asset. Legendary Pictures fully utilize user behavior data and interest tags in marketing and communication, using AI analysis to predict audience

preferences. For example, before the release of the film, based on the interaction behavior data of the audience towards the trailer, Legendary Pictures adjusted the target audience and customized local promotion content based on the cultural characteristics of different regions. This data-driven approach effectively improved communication efficiency and enabled marketing budgets to achieve higher conversion rates. For example, for the preferences of audiences in Latin America, Legendary Pictures prioritized promoting emotional plot segments of the film in that region rather than a single visual effect segment, thereby achieving higher click-through rates and topic discussions in that market.

4. Revelation and outlook

4.1. Key insights

Digitalization is the prevailing trend in today's era, and it is no different for the film and television industry. The ecological reconfiguration of the digitalization of the film and television industry is particularly important. Based on the above analysis, the following insights can be drawn. The first insight is technology empowerment. The practices of Marvel and Legendary Pictures jointly demonstrate that technology empowerment can significantly enhance work efficiency. For example, during the production of the "Avengers 4" with the full CG "time travel suit", the crew wore ordinary clothing or tracking suits during filming, and the post-production team replaced all the CG models for the final effect - this is a typical case of technology empowerment [8]. At the same time, Marvel Pictures used the ProductionPro cloud production management system in "Black Panther 2". This system is based on the "single source of truth" concept, centralizing all digital assets such as scripts, concept art, storyboards, etc. for centralized management. 184 characters, 322 scenes, and 372 reference materials were all managed collaboratively through the cloud [9]. Marvel follows a systematic and platform-based route of accumulating digital assets, while Legendary follows a vertical and scenario-based approach to breakthroughs in cutting-edge technologies. However, the deeper insight is the truly effective technology empowerment, not simply introducing AI tools or virtual shooting equipment sporadically but establishing an ecosystem where technology and business are deeply integrated, allowing data to interact in all aspects of the industry, from creation, production, promotion, to derivative development.

The second revelation is the "fan economy" model of Marvel and the "algorithm-driven" model of Legendary. The so-called fan economy refers to a business model that forms based on the emotional connection between celebrities, influencers, and IP, centered around these IPs. The so-called algorithm-driven refers to a model that uses computer algorithms as the core driving force to guide content distribution, user matching, etc. These two models represent two different forms centered around the audience. Marvel has been deeply involved in the fan community for twenty years, through deep interaction with fans and in-depth operation of offline comic exhibitions, converting the audience into "Marvel fans" with a high degree of identification. This deep connection transformed into a phenomenon-level viewing ritual when "Avengers: Endgame" was released. Legendary Pictures, on the other hand, more often uses user data from platforms like Netflix to guide content strategies, by analyzing behavioral data such as user profiles, viewing duration, and completion rate, to optimize the pacing and monster appearance timing of "Godzilla 2". Both models have their own advantages, but the common lesson is that centering on the audience is not simply "pleasing the audience" but integrating the audience into the value creation of the film. The future direction is not a choice between the two but rather integrating the deep emotional

connection of fans with the precise insight of algorithms to achieve the dual drive of "data-driven" and "emotional identification".

The third revelation is differentiated positioning. Although Marvel and Legendary are both in the Hollywood system, they have taken completely different digital paths. This phenomenon itself vividly illustrates differentiated positioning. Marvel is positioned as the pioneer of "cosmological narrative", and its digital strategy serves to build a highly interconnected Marvel film universe; Legendary is positioned as the operator of "spectacular IP", and its digital path focuses on the visual breakthrough and cross-media derivative of a single IP. This differentiation is not accidental, but a strategic choice based on their respective resources: Marvel has a copyright library of over 8,000 characters, possessing the inherent advantage of building a universe [10]; Legendary has accumulated deep expertise in the monster theme and is more adept at achieving the ultimate perfection of a single IP. The success of both film studios jointly proves that in the digital era, there is no universal model for all enterprises. True competitiveness comes from a clear understanding and positioning of one's own industry. Instead of competing in popular tracks, it is better to build an irreplaceable differentiated advantage in a niche field.

4.2. Future outlook

The first future outlook is the upgrading of communication diversity. The communication strategies of Marvel and Legendary have evolved, indicating that diverse communication forms are necessary to adapt to the current development trends of the era. Marvel has continuously diversified its communication channels, from initially relying on the cinema window to later collaborating with Netflix to develop series such as "The Nightcrawler" and then launching a streaming media matrix on the Disney platform. Legendary Pictures, on the other hand, has deepened its binding with Netflix beyond theatrical releases and directly launched derivative content such as "Godzilla: Monster Planet" onto streaming platforms. This trend will further deepen in the next decade. On one hand, data-driven push will become the core logic of content distribution. Data platforms like Maoyan and Lighthouse will further influence the promotion strategy through user profiling analysis, and short-video platforms like Douyin and Kuaishou will foster fragmented consumption habits. On the other hand, immersive technologies have expanded into new consumption scenarios: cinemas are using 5G technology to create a "super entertainment space" that integrates entertainment, consumption, and social interaction; virtual reality films are driving the transformation of film IP from real-world tourism and culture to immersive experience new business forms; Game and film integration work create new aesthetic experiences with "post-hypotheticality" and "simulacrum". Marvel is already exploring the combination of the Avengers IP with VR experiences, allowing fans to "participate" personally. Therefore, the future communication will no longer be a one-way content distribution, but a multi-dimensional immersive experience network.

The second future outlook is the upgrade of technological development. Currently, AI technology in the film and television industry is still mainly used for auxiliary functions - Marvel uses AI to assist in shot design, and Legendary uses AI to optimize special effects rendering. In the next three to five years, AI will upgrade from an "auxiliary tool" to a "creative collaborator". Various forms of technology will enable AI to understand the emotional tone of the script, generate matching visual styles, and even propose more reasonable and market-appropriate creative suggestions. Taking the monster fight scene in "Godzilla vs. Kong" as an example, in the future, AI will not only optimize the action logic but also autonomously generate action design plans that are in line with the characters' personalities and audience expectations based on deep learning of previous work data. At

the same time, virtual shooting technology will evolve from the current "post-production prepositioning" to "creation as presentation".

5. Conclusion

This paper conducts a comparative analysis of the digital breakthroughs and diverse dissemination strategies of Marvel and Legendary Pictures. It discovers that technology empowerment, audience-centered approach, and differentiated positioning are the core insights for the reconfiguration of the digital ecosystem in the film and television industry. Marvel achieved a coordinated upgrade in content production and dissemination through AI assistance, diversified channels, and innovative business models; while Legendary Pictures demonstrated unique advantages and shortcomings in the digital path, and its diverse dissemination strategy provided a differentiated model for the industry. Together, these two cases indicate that technology itself is not the decisive factor; the ecological reconfiguration centered on the audience and precise positioning are the sources of sustainable competitive advantages.

At the same time, this research has certain limitations. In the future, it can be expanded from the following dimensions: First, conduct cross-national and cross-regional comparative studies to explore the differences in digital paths of different film and television industry systems; second, deepen audience research to investigate the deep impact of algorithmic recommendations on viewers' aesthetic preferences and cultural identity; third, expand research on technological ethics, focusing on issues such as AI content copyright, digital actor image rights protection, and algorithm bias; fourth, promote the implementation of relevant policies to assess the compatibility and innovation demands of existing industry policies in areas such as data security, anti-monopoly, and cultural diversity protection.

In the future, as technology evolves and dissemination progresses, the film and television industry need to further balance innovation and challenges and promote high-quality development of the industry.

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