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Article

Advancing the Industrial Chain and International Competitiveness of Qingdao as a Film Capital through Film and Television Technology Innovation

Linna Bao[1,*]

[1] Qingdao Film Academy, Qingdao, China
* Correspondence: Linna Bao, Qingdao Film Academy, Qingdao, China

Abstract: Film and television technology innovation is profoundly transforming production methods, industrial organization, and the international competitive landscape of the global film industry. As virtual production, digital filmmaking, artificial intelligence-generated content (AIGC), and motion capture increasingly integrate into modern creation processes, industry competition now encompasses technological research, content production, and industrial-chain coordination. Building on the Qingdao Oriental Movie Metropolis, Qingdao has established a robust industrial foundation centered on large-scale production facilities, specialized studios, and digital technology platforms. Consequently, technological innovation drives the continuous transformation and upgrading of Qingdao's film sector. Drawing on practical experiences involving the virtual production platform, micro-drama industry development, AIGC content production, and international exchanges, this paper systematically examines the existing foundations, key challenges, and underlying relationships between technological innovation and industrial-chain development in Qingdao. It then proposes a coordinated development approach centered on core technology platforms, focused on industrial-chain collaboration, oriented toward emerging content production forms, and supported by a comprehensive international service system. This strategic approach effectively coordinates talent, technology, enterprises, and markets, providing a valuable reference for developing Qingdao as a premier film capital and significantly enhancing its international competitiveness in the global film and television industry. Furthermore, the study highlights the critical role of policy support and cross-border collaboration in fostering a sustainable ecosystem.

Keywords: film technology; industrial upgrading; aigc; international competitiveness; film capital

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1. Problem Statement: Film and Television Technology Innovation and the Transformation of Qingdao's Film Industry

The film and television industry is a cultural sector characterized by the integration of advanced technology and creative content. Ongoing advancements in cinematography, sound recording, editing, digital visual effects, virtual production, and artificial intelligence have transformed not only the methods of content creation but also production workflows, enterprise specialization, and market dynamics [1]. As digital and intelligent production capabilities accelerate, the competitive positioning of film and television bases increasingly relies less on physical infrastructure—such as the number of sound stages, scale of set construction, or volume of hosted productions—and more on integrated technology platforms, specialized service ecosystems, original content development, cross-sector industrial collaboration, and the capacity to coordinate international resources.

Qingdao's film and television industry has developed a distinctive industrial foundation. Through sustained investment and strategic planning, the Oriental Movie Metropolis Film and Television Industrial Park has established a professional production

ecosystem encompassing sound stages, set-construction workshops, virtual production facilities, motion capture studios, and complementary production support services. Major domestic productions—including *The Wandering Earth* series, *Creation of the Gods Trilogy*, and *Home Coming*—have been filmed there, significantly enhancing Qingdao's reputation for large-scale, industrialized filmmaking. Concurrently, the Northern Micro-Drama Film and Television Base and several specialized studios have broadened the city's scope beyond traditional feature and television drama production to include online micro-dramas, digital-first content, and internationally oriented co-production initiatives [1].

In terms of scale, during the 14th Five-Year Plan period, Qingdao's film and television bases hosted over 700 production crews, registered nearly 600 projects, and contributed cumulative box-office revenue exceeding RMB 41.5 billion. A total of 27 works received national-level honors, including the Five-One Project Award, the Huabiao Film Awards, and the Golden Rooster Awards. In 2025, 95 film and television works from the West Coast New Area were included in the national project filing and approval announcements—54 of which were online micro-dramas—reflecting an evolving content structure. For the full year of 2025, 48 above-designated-size film and television enterprises reported operating revenue of RMB 1.246 billion, representing 82.14% of the cultural and entertainment industry output in the district and 20.94% of that in Qingdao overall. These figures confirm the sector's growing centrality within the regional cultural economy. However, expansion in scale and infrastructure does not automatically strengthen end-to-end industrial chain competitiveness. According to the *Report on the Development of Qingdao Film and Television Bases*, shifting national market conditions and structural industry adjustments have impacted demand for feature films and long-form television dramas. Some production entities remain highly reliant on projects facilitated through the Oriental Movie Metropolis, leading to pronounced cyclical fluctuations in activity. Several key enterprises have faced periods of constrained income, while challenges such as a relatively concentrated industrial structure and limited operational resilience have become increasingly evident. At the same time, emerging formats—including artificial intelligence–driven tools, virtual production systems, and micro-drama platforms—are redefining the parameters of competitive advantage. Consequently, traditional film and television bases must evolve beyond location-centric, project-hosting models toward integrated approaches grounded in technological capability, content innovation, service sophistication, and coordinated market engagement.

Research into film and television technology innovation in Qingdao should therefore extend beyond equipment procurement and superficial technology adoption. It must investigate how innovations are embedded within actual production workflows, how they enable participation and value capture by local enterprises, how they generate sustainable revenue through high-value industrial services, and how international partnerships can broaden market access. Ultimately, the critical question facing Qingdao is whether technological advancement can be systematically translated into enhanced industrial chain capabilities—marking its transition from a prominent production base to a globally recognized film capital [2].

2. Current Foundations of Film and Television Technology Innovation and Industrial-Chain Development in Qingdao

2.1. An Industrialized Film Production Platform Centered on Oriental Movie Metropolis Is Taking Shape

Industrialized film production capacity is an important foundation for Qingdao's participation in domestic and international film and television project development [1]. Through the construction of sound stages, set-construction workshops, professional equipment, and related service facilities, the Oriental Movie Metropolis Film and Television Industrial Park has established a comprehensive production environment for large-scale film and television projects. In recent years, the park has advanced digital transformation and technological upgrading by introducing a virtual production platform,

a micron-level facial scanning system, a dome light-field system, Alibaba Frame Enjoy LED sound stages, and the UK's Dison motion-capture system—enabling the evolution of traditional filming spaces into digitally enabled, specialized production platforms.

In 2024, the Oriental Movie Metropolis development project received RMB 12 million in support from the National Film Industry Development Special Fund [3]. The funding supported the construction of specialized sets and the procurement of high-tech equipment. That year, the facility served over 290 film and television production projects, further consolidating its industrialized production capabilities. According to the *Report on the Development of Qingdao Film and Television Bases*, the project has received two rounds of funding from the National Film Industry Development Special Fund, totaling RMB 23 million, and has established a mature foundation for virtual production. In practice, the integration of virtual production, digital environments, and motion-capture technologies reduces reliance on physical location work and conventional set building; instead, many scenes are designed, visualized, and realized through digital means. This redefines the functional scope of sound stages and creates new technical enablers for complex narrative sequences, science-fiction storytelling, and high-end visual effects.

In 2026, at a symposium on innovation and development in film technology, Oriental Movie Metropolis showcased advancements in its virtual production platform and the application of 4D Gaussian splatting for film and television production. It also outlined collaborative initiatives with enterprises engaged in VR-based cinematic experiences and ultra-high-definition industry alliances, reflecting an expansion of its technology services beyond conventional production toward emerging paradigms of digital image creation [4].

2.2. Collaboration between Digital Technology and Film and Television Enterprises Is Gradually Expanding

Film and television technology innovation extends beyond equipment upgrades; it entails coordinated efforts among technology firms, production entities, and specialized service providers. Around Oriental Movie Metropolis, Qingdao has cultivated an industrial cluster integrating professional film production with digital technology resources. Digital sound stages linked to Alibaba's digital entertainment ecosystem, the Dison Technology Motion Capture Creation Center, and enterprises focused on practical effects, digital imaging, and post-production jointly support the implementation of advanced film and television technologies [5].

Currently, collaboration between technology providers and production companies in Qingdao manifests across three dimensions. First, technology platforms—such as LED virtual production and motion-capture systems—have been integrated into professional production environments. Second, individual film and television projects facilitate temporary alliances among practical-effects specialists, digital production teams, and technical service providers [6]. Third, partnerships with external technology firms enable the adoption of novel digital imaging techniques and production solutions, expanding the technological capabilities of Qingdao's film and television sector.

In 2026, Oriental Movie Metropolis advanced exploratory applications of 4D Gaussian splatting in film and television production and engaged in technical exchanges with relevant industry partners [6]. This work opens new pathways for environment capture, digital scene construction, and emerging visual content formats. However, widespread deployment and commercially viable operational models remain contingent upon validation through real-world productions. Qingdao has thus established an initial framework for technology collaboration; the next strategic focus is shifting from ad hoc project-based engagement toward sustained service delivery, co-developed research initiatives, and enduring institutional partnerships.

2.3. AIGC and Micro-Dramas Are Accelerating the Development of New Forms of Film and Television Content Production

Artificial intelligence is transforming the technological foundations and organizational frameworks of film and television content production. Relative to

traditional films and television dramas, AI-generated short dramas and AI-assisted animated dramas introduce novel approaches to content ideation, visual design, asset generation, and selected production workflows. These innovations present film and television production bases with expanded opportunities to deliver digital-content production services [7].

From January to February 2026, the West Coast New Area recorded three micro-drama project filings, 17 works in active filming or post-production, and 14 releases. During the same period, 12 AIGC-based works were released. Among them, *The Dragon Flame Descends*, developed with technical support from the AI Animation Workshop at Qingdao Film Academy, premiered on Tencent Video—highlighting an emerging synergy between academic creative practice and regional digital-content production [5]. Cumulatively, from January to May 2026, the New Area provided production services for 160 micro-dramas, including 60 AI-generated short dramas. By July, the cumulative total reached 251 micro-dramas, of which 116 were AI-generated—representing 46.2% of the total. From January to September, the cumulative count stood at 312 micro-dramas, with 176 AI-generated short dramas accounting for 56.4%. This upward trend reflects the growing integration of AI technology into micro-drama production within the New Area. It should be noted that all figures represent year-to-date totals as of each reporting month, not discrete monthly outputs; furthermore, the count of AI-generated short dramas does not reflect the full scope of AI application across broader film and television production activities.

Growth in the micro-drama sector has supported the geographic diversification of production infrastructure [7]. In January 2026, the West Coast New Area issued the *Implementation Opinions on the High-Quality Development of the Online Micro-Drama Industry*. The document outlines targets for 2028: establishing two to three functionally integrated micro-drama bases with mature industrial chains; aggregating over 30 industry-linked enterprises and more than 10 key enterprises; and producing over 400 micro-drama works annually. It further advocates for the application of artificial intelligence in content creation and for cross-sectoral integration under the 'micro-dramas plus' framework. These objectives signal a strategic shift—from ad hoc, project-driven production toward standardized, industrialized development—achieved through base construction, enterprise clustering, systematic content creation, and enhancement of supporting links across the value chain.

2.4. Public Services and Talent Development Support the Industrial Application of Technology

Film and television technology innovation relies on a stable public service infrastructure and a steady supply of specialized talent. Qingdao has established a Film and Television Industry Development Center and a one-stop public service hall for film and television bases. Through integrated online and offline service delivery, these institutions support enterprise registration, production filming, location coordination, and policy application procedures [7].

The 'Qingdao Film and Television Base' mini-program, launched in 2026, consolidates enterprise services, production-crew support, and film and television policy information onto a unified digital platform. It catalogs 180 designated filming locations across the district and features bilingual (Chinese–English) interface support, location search functionality, resource matching, and production-crew booking capabilities [8]. By July 2026, the platform's listed filming locations had grown to 216, reflecting ongoing enhancement of digital resource management and public service scalability.

For talent development, the West Coast New Area hosts multiple universities and institutions offering film and television-related academic programs. Qingdao Film Academy, among others, contributes professional talent and practical training resources to the sector. In 2024, over 8,000 students in the New Area were enrolled in film and television–related or closely aligned disciplines, and several industry–education integration bases maintained collaborative teaching and practice arrangements with higher education institutions. In 2026, Oriental Movie Metropolis delivered AI animation

training to university students. An AIGC film and television creation event organized by iQIYI drew more than 400 participants, including university representatives, industry professionals, association members, faculty, and students—highlighting the growing emphasis on AI-driven content creation competencies and cross-sectoral professional exchange in talent cultivation [9].

3. Major Challenges Facing the Upgrading of Qingdao's Industrial Chain through Film and Television Technology Innovation

3.1. Advantages in Technological Facilities Have Not Yet Been Fully Converted into Advantages Across the Entire Industrial Chain

Qingdao already possesses technological infrastructure for virtual production, motion capture, digital imaging, and professional film and television production. However, the advancement of technological equipment does not automatically translate into comprehensive industrial chain upgrading. The film and television industrial chain encompasses pre-production creative development, scriptwriting, digital asset management, technology R&D, on-set production, post-production, distribution, marketing, copyright operations, and derivative development—not merely sound stages or physical production facilities. While Qingdao has established a solid foundation in professional filming and project execution, interlinkage across these functional segments remains suboptimal. Certain technology resources are deployed primarily on an ad hoc basis for individual productions, and enduring collaborative frameworks between technology providers and content producers have yet to mature. Several emerging technologies have undergone initial validation or pilot deployment, but broad-scale commercial implementation still requires further testing and refinement. Consequently, Qingdao's film and television technology innovation strategy must evolve from isolated technology adoption toward a holistic, integrated industrial chain approach—fostering sustained alignment among technology R&D, project application, enterprise support services, and market-oriented operations, thereby ensuring that capital investment in equipment yields commensurate growth in local technology service capacity and industrial value-added.

3.2. The Industrial Structure Remains Heavily Dependent on Large-Scale Film and Television Projects, and Business Stability Is Insufficient

According to the Report on the Development of Qingdao Film and Television Bases, enterprises engaged in film and television production and production supply chains constitute a substantial portion of the local film and television industry. Some enterprises rely heavily on projects hosted at Oriental Movie Metropolis, resulting in pronounced cyclical fluctuations in business performance. A 2026 report further indicated that certain key enterprises encountered periods of constrained operating revenue, suggesting that variations in project volume directly influence local business stability. This highlights that industrial clustering alone does not guarantee resilient inter-enterprise collaboration [10]. When enterprises primarily deliver one-off services to production crews, demand for associated equipment, personnel, and support services tends to decline sharply upon project completion. Consequently, sustained investment in technology research and development—and the cultivation of long-term operational viability—becomes challenging. While preserving its capacity to host major film and television productions, Qingdao should actively expand into diversified digital-content production, virtual production services, post-production, AI-driven content creation, copyright operations, and integrated technical solutions, thereby mitigating overreliance on single-project-driven demand.

3.3. The Application of Emerging Technologies Such as AIGC Needs to Be More Closely Connected with High-Quality Content Production

The rise in AI-generated short dramas has contributed to production expansion in Qingdao's film and television sector. Yet technological adoption alone does not guarantee

enhanced content quality or greater market competitiveness. While AIGC can streamline visual generation, asset creation, and certain creative tasks, narrative coherence, artistic execution, character depth, and cultural resonance remain contingent upon professional creative expertise.

From January to September 2026, AI-generated short dramas represented 56.4% of all micro-dramas produced in the New Area, reflecting broad integration of AI into content workflows. However, sustained industrial advancement requires balanced development: overemphasis on cost-efficient, rapid output—without commensurate progress in scriptwriting, direction, artistic design, intellectual property management, and commercial operations—risks widening the gap between output volume and high-quality output capacity.

AI-generated content presents challenges related to intellectual property rights, source material authorization, content safety review, and transparent technology identification [11]. As oversight frameworks evolve, Qingdao must reinforce both responsible AI implementation practices and core creative capabilities, ensuring that technological advancement and content excellence advance in tandem.

3.4. Coordination among Technology Enterprises, Film and Television Enterprises, and Universities Needs to Be Improved

Qingdao hosts a diverse ecosystem comprising film and television industrial parks, universities, technology enterprises, and specialized production organizations. However, the complementary resource advantages of these stakeholders have yet to coalesce into stable, institutionalized industrial partnerships. Universities excel in cultivating professional talent and conducting technological experimentation; technology enterprises possess robust research and development capabilities along with equipment and service infrastructure; film and television enterprises maintain deep insight into real-world project requirements; and film and television bases offer physical production environments and public service platforms. Establishing sustained linkages between technological innovation and industrial application requires an effective, systematic coordination mechanism. Currently, industry-university-research collaboration is largely confined to short-term training initiatives, thematic events, or discrete projects. Significant opportunities remain to deepen long-term joint R&D, accelerate the commercialization of research outputs, co-develop technical standards, and implement integrated talent development pathways—especially in rapidly evolving domains such as AIGC, virtual production, motion capture, and digital asset management, where the scale and pace of innovation often exceed the capacity of individual enterprises to shoulder research and implementation costs independently.

3.5. International Services and Overseas Market Development Are Still Being Strengthened

International competitiveness is reflected not only in the number of overseas screenings and the scale of film and television production projects, but also in comprehensive capabilities involving the attraction of international projects, cross-border production services, international talent exchanges, customs clearance for equipment, copyright transactions, and overseas distribution. Qingdao has established a preliminary foundation for international film and television exchanges. In September 2026, Oriental Movie Metropolis joined a delegation organized by the China Television Artists Association for film and television cultural exchanges in South Korea and Singapore, where discussions with local industry representatives covered content creation, industrial cooperation, and the operation of film and television bases. Emperor (Qingdao) Pictures was registered in the New Area as the first film and television enterprise funded from Hong Kong, China, introduced there. During the same period, several films produced in the New Area participated in Chinese film festivals and film weeks in Seychelles, Sweden, Canada, Malta, Portugal, Iceland, and other countries. Meanwhile, the development of the International Film and Television Production Service Center is still underway. According to relevant reports, the project has been included in the list of customized tasks under Qingdao's comprehensive pilot program for expanding the opening-up of the service

sector. Its development plan is being circulated for comments, while a bilingual online service platform and an offline service hall are also being prepared. This indicates that Qingdao has established a clear direction for developing its international service capacity. Nevertheless, further work is needed to move from institutional planning to actual operations and from exchange activities to stable international project cooperation.

4. Underlying Mechanisms through Which Film and Television Technology Innovation Drives the Upgrading of Qingdao's Industrial Chain

4.1. Technology Platform Development Shifts Film and Television Production from Facility Provision to Specialized Services

Film and television technology innovation fundamentally transforms the production capacity of film and television bases. Traditional bases primarily offer spatial infrastructure—such as sound stages, set-construction workshops, and on-location filming sites. In contrast, digitally enabled bases must deliver advanced technical services, including virtual production, motion capture, digital scene generation, visual effects, and integrated post-production solutions [12].

As technology platforms become embedded in the production workflow, the role of a production base evolves from simple location rental to comprehensive, specialized service provision. These platforms enhance operational efficiency while fostering collaboration among technology service providers, creative production teams, and project stakeholders—thereby enabling a more refined and vertically integrated production ecosystem. Leveraging the existing technological infrastructure at Oriental Movie Metropolis, Qingdao can advance industrial-chain upgrading by prioritizing alignment between equipment capabilities and diverse project demands. Emphasis should be placed on ensuring consistent application of virtual production, digital filmmaking, and motion-capture technologies across varied film and television formats, progressively standardizing them into scalable, replicable professional service modules.

4.2. Artificial Intelligence Promotes Changes in Content Production Methods and Industrial Structure

The advancement of AI-generated content is transforming film and television production from traditional manual workflows toward human-AI collaborative models. AI technologies support diverse stages including script development, visual design, digital character creation, scene generation, media asset processing, and post-production, thereby enabling new production paradigms for short dramas, animated series, and other digital audiovisual formats. The rapid expansion of micro-drama production in Qingdao provides a practical context for deploying these technologies. As AI-generated short dramas proliferate, ancillary sectors—including technical service provision, content strategy, intellectual property administration, platform operation, and specialized talent cultivation—are gaining momentum [13]. Nevertheless, artificial intelligence must not be reduced to a mere replacement for professional creative labor. Qingdao should strategically integrate AI tools with live-action filmmaking, industrialized production systems, and formal arts education to establish a hybrid model that balances technological efficiency with artistic integrity. This integration ensures that emerging technologies serve as catalysts for upgrading the entire industrial chain rather than merely accelerating content volume.

4.3. Industrial-Chain Collaboration Converts Technological Achievements into Industrial Value

The economic value of technological innovation is realized only through enterprise collaboration and market application. In Qingdao, film and television technology enterprises, universities, production companies, specialized studios, and platform organizations should strengthen collaborative linkages [4]. Technology enterprises supply technical solutions; production companies articulate practical requirements; universities support talent cultivation and applied research; and film and television bases offer project incubation and public services. Establishing coordinated mechanisms for

joint R&D, technical validation, outcome implementation, and market dissemination helps bridge the information asymmetry between technology development and production practice, thereby enhancing the efficiency of technology transfer and commercialization. This approach also enables local enterprises to engage in higher-value segments of the industry, facilitating a transition from project-driven clustering—triggered by incoming production crews—to clustering anchored in technology services, content creation, and integrated industrial-chain collaboration.

4.4. International Cooperation Expands the Film and Television Industry from Local Production to Global Resource Allocation

Enhancing international competitiveness requires aligning local industrial capabilities with global market demands. Film and television projects inherently involve collaboration across regions, cultures, and sectors. An international service platform supports overseas production teams by providing accessible information on local filming locations, production infrastructure, talent pools, and policy support mechanisms, thereby lowering information asymmetry and coordination barriers in transnational production. Qingdao has initiated the establishment of an International Film and Television Production Service Center and strengthened global engagement through the Star Island overseas studio, international film and television exchange programs, and overseas exhibition activities. Integrating advanced technology platforms with a comprehensive international service framework enables Qingdao to further attract foreign film and television projects, transforming locally cultivated production capacities—fueled by technological advancement—into robust capabilities for hosting international co-productions and engaging in cross-regional collaborative initiatives [14].

5. Implementation Pathways for Upgrading the Industrial Chain and Enhancing the International Competitiveness of Qingdao Film Capital through Film and Television Technology Innovation

5.1. Strengthen the Technological Innovation Platform at Oriental Movie Metropolis and Enhance Core Production Capabilities

Qingdao should continue to leverage the central role of Oriental Movie Metropolis in the city's film and television industry. It should promote the integration and upgrading of existing technology platforms in areas such as virtual production, digital filmmaking, motion capture, visual effects, and digital scene construction. On the one hand, it should build on existing sound stages, set-construction workshops, and digital production facilities to establish a technology service system for different types of film and television projects, improving the utilization of professional equipment and the capacity to provide technical services. On the other hand, it should actively conduct joint testing and project applications involving 4D Gaussian splatting, XR virtual production, and other emerging imaging technologies, transitioning technical solutions from experimental validation to operational deployment. An evaluation mechanism for the application of film and television technology projects should be established, focusing on whether a technology addresses practical production problems, reduces production costs, generates stable service demand, and encourages local enterprise participation. Innovation outcomes should not be assessed solely by the number of devices or the novelty of technological concepts.

5.2. Attract and Develop Enterprises in Key Links of the Film and Television Industrial Chain through Targeted Investment Promotion

Investment promotion in Qingdao's film and television industry should transition from broad recruitment of production companies to strategic, targeted investment in critical segments of the industrial chain. Priority areas requiring reinforcement include pre-production creative development, digital asset creation, virtual production, visual effects, post-production, copyright management, and international distribution. A curated pipeline of high-potential enterprises and technology projects should be

established accordingly. For technology enterprises already operating locally, support mechanisms—including joint production initiatives, technical service collaboration, shared equipment access, and co-developed research projects—should facilitate sustained partnerships with Oriental Movie Metropolis and regional production entities [2]. Small and medium-sized technology enterprises exhibiting growth potential may receive tailored assistance through industrial park services, project matchmaking, specialized talent development programs, and policy application guidance, enabling their evolution from single-project contractors into dedicated film and television technology service providers. Furthermore, enterprise business resilience must be strengthened by diversifying revenue streams across major film and television productions, micro-dramas, advertising, and digital audiovisual content, thereby mitigating overreliance on individual projects.

5.3. Promote the Coordinated Development of AIGC and the Micro-Drama Industry to Build Advantages in New Forms of Content Production

Qingdao should position AI-based content production as a strategic driver for industrial transformation, moving beyond quantitative expansion of AI-generated short dramas toward systemic advancement. A cohesive industrial ecosystem must be cultivated, integrating high-quality content creation, technology R&D, professional talent development, and market-oriented operations. First, the AI content production service platform should be enhanced to provide comprehensive support for creative experimentation in AI-animated dramas, AI short films, digital characters, and virtual environments—serving film and television enterprises, universities, and technology teams alike. Second, upstream and downstream links in the micro-drama value chain—including script development, filming and production, post-production and packaging, copyright operations, and platform distribution—must be strengthened to enable local enterprises to meet diversified project demands. Third, robust content quality governance mechanisms should be implemented, with rigorous attention to originality of scripts, artistic integrity, lawful copyright authorization, and transparent labeling of AI-generated elements, ensuring responsible and standards-compliant application of AI technologies. Fourth, cross-format technological synergy should be fostered among live-action short dramas, AI-generated short dramas, and conventional film and television production, promoting mutual enhancement across content modalities. Fifth, the industrial development goals outlined in the *Implementation Opinions on the High-Quality Development of the Online Micro-Drama Industry* should serve as the foundational framework for the steady construction of full-chain micro-drama bases, enterprise clusters, and high-quality content production capacity—effectively converting policy guidance into enduring industrial competitiveness.

5.4. Improve the International Film and Television Production Service System and Strengthen Cross-Border Production and Overseas Cooperation

Enhancing international service capacity is a key strategy for strengthening Qingdao's competitiveness in the film and television industry. Accelerated development of the International Film and Television Production Service Center is required, with systematic upgrades to institutional frameworks, information infrastructure, and professional support services for cross-border projects. First, a bilingual online service platform and an integrated offline service hub should be established, consolidating data on filming locations, professional equipment, crew resources, enterprises, and policy provisions to offer overseas production teams a clear, centralized access point. Second, coordination mechanisms must be strengthened for practical operational needs—including personnel deployment, customs clearance of production equipment, foreign exchange settlement, and administrative procedures—gradually establishing standardized, specialized service protocols for international film and television production. Third, real-world assets linked to the Star Island overseas studio—such as hospitality facilities, yacht clubs, coastal scenery, and international educational institutions—should be coordinated to enhance location-based services and production

support for short-form dramas targeting overseas audiences and broader international co-productions. Fourth, collaboration with film and television institutions in South Korea, Singapore, Japan, and other regions should deepen beyond delegation visits and cultural exchanges to encompass joint production, project incubation, talent mobility, and technological cooperation. Fifth, Qingdao-originated works should receive targeted support for participation in international film festivals and cultural exchange activities, aligning overseas screenings with global distribution pathways, copyright partnerships, and the promotion of Qingdao's urban identity.

5.5. Deepen University-Industry Collaboration and Develop a Talent System for Film and Television Technology

Film and television technology innovation demands interdisciplinary professionals who integrate foundational knowledge of film and television creation with expertise in digital technologies and industrial operations. Qingdao hosts specialized institutions such as Qingdao Film Academy, which are well-positioned to strengthen talent development, technological application, and creative production. A structured collaboration framework should be established among universities, Oriental Movie Metropolis, film and television technology enterprises, and micro-drama bases. Practical curricula must incorporate virtual production, AI-generated content creation, digital imaging, motion capture, and film and television project management [15]. Through project-based learning grounded in real industry assignments, students should actively engage in digital content creation, implementation of production technologies, and operational aspects of the film and television sector—ensuring tighter alignment between education and industrial requirements. Joint training initiatives involving industry practitioners, enterprise technologists, and academic faculty should be promoted. A comprehensive professional training system is needed for film and television technology applications, AI-driven content production, and international project management, thereby enhancing the technological agility and cross-border cooperation capacity of Qingdao's film and television workforce.

5.6. Promote the Development of Film and Television IP and Link It with Urban Consumption to Extend the Value Chain

The impact of film and television technology innovation and industrial-chain upgrading should extend beyond production to encompass distribution, intellectual property development, and urban consumption. Qingdao should further integrate film and television works with the city's cultural resources, advancing intellectual property (IP) development from single-work distribution toward diversified cultural products.

During the production launch of *The End of Ten Days*, the New Area coordinated commercial-district activities and fan engagement initiatives involving Oriental Movie Metropolis, the Qingdao Film Museum, Sunac Mall, and hotels on Star Island. During the May Day holiday in 2026, Sunac Mall achieved sales exceeding RMB 30 million and attracted over 500,000 visitors. Foot traffic at Sunac Land rose by 23% year on year, while sales at the Star Island star-rated hotel cluster increased by more than 32% year on year. This case demonstrates that public interest generated by a film or television project can be effectively channeled into consumption through location-based activation, commercial-district collaboration, and integrated tourism services. Subsequent evaluation is needed to clarify the distinct contributions of various consumption stakeholders. Building on this experience, Qingdao can strengthen coordination among filming location access, interactive museum experiences, studio educational tours, film and television-themed events, and curated urban tourism routes—establishing an extended industrial-chain model that integrates IP, urban space, and cultural consumption.

5.7. Improve Industrial Policies and Service Mechanisms to Establish Institutional Support for Sustained Technological Innovation

Film and television technology innovation entails substantial investment, rapid technological evolution, and variable project timelines, necessitating a stable, well-

structured, and sustainable policy environment. Qingdao should refine its film and television industry policies and public service mechanisms to align with the differentiated development requirements of enterprises across scales and business models.

For large-scale industrialized film and television projects, support should prioritize advancement of core technologies, cultivation of specialized production capacities, and facilitation of high-caliber project execution. For small and medium-sized technology enterprises, emphasis should be placed on research and development, translation of research outcomes into practical applications, and enhancement of niche service capabilities. For micro-drama and AI-generated content enterprises, strengthened guidance is required in areas including content quality assurance, intellectual property protection, and regulatory compliance in production. For internationally collaborative film and television initiatives, priority should be given to optimizing cross-regional production coordination and expanding related public service infrastructure. Industrial statistics and operational monitoring must be enhanced, with distinct metrics tracking the number of film and television enterprises, registered projects, projects actually filmed or produced, enterprise operating revenue, technology service revenue, and overseas business volume. Industrial performance assessment must extend beyond simple counts of registered projects or enterprises.

Establishing systematic mechanisms for industrial data tracking, enterprise demand feedback, and policy implementation evaluation will enhance the responsiveness and precision of policy delivery, thereby sustain technological innovation and upgrading the film and television industrial chain [16].

6. Conclusion

Film and television technology innovation is becoming an important driver of Qingdao's development as a film capital and of the transformation and upgrading of its film and television industry. Building on the industrialized production foundation established at Oriental Movie Metropolis, the progressively maturing virtual production and digital filmmaking platforms, and the emergence of new content formats—including micro-dramas and AI-generated content—Qingdao's film and television industry now possesses the practical conditions to expand beyond traditional project hosting into technology services, content production, and industrial-chain collaboration. Current developments indicate that Qingdao has achieved phased progress in film and television technology innovation. However, a gap persists between the advancement of technological infrastructure and the holistic upgrading of the industrial chain. Key challenges include enterprises' strong reliance on project-based resources, limited large-scale adoption of technological innovations, and the need to strengthen interdisciplinary talent development and international service capabilities.

Qingdao's competitive advantages as a film capital should not be assessed solely by metrics such as sound stage capacity, volume of hosted production crews, or quantity of completed works. Rather, they must be reflected in its capacity to sustainably innovate film and television technology platforms; cultivate industrial-chain enterprises with stable market demand; develop a content creation system capable of consistently delivering high-quality output; and build a professional service network that connects domestic capabilities with international film and television resources. Anchored by technology innovation as the primary driver, Oriental Movie Metropolis as the core platform, industrial-chain collaboration as a strategic priority, emerging content forms—including AI-generated content and micro-dramas—as growth catalysts, and talent development and international services as foundational enablers, Qingdao must convert technological advantages into industrial advantages, and industrial advantages into market advantages. This approach will support the gradual formation of an integrated industrial structure—coherently linking technology, content, enterprises, talent, and international markets—and thereby reinforce Qingdao's position as a globally competitive film capital.

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