A Broadcasting-Centric Approach to Redefining the Look of the Games Design

1st Yijun Chen
School of Design
Central Academy of Fine Arts
Beijing, China
goodboy1211@163.com

***Abstract*—The successful hosting of the Beijing 2022 Winter Olympics amid the COVID-19 pandemic has shifted the spectator experience from on-site to online, challenging the traditional design paradigm of look of the Games centered on "on-site immersion." This study systematically explores the construction logic and practical effectiveness of a "broadcasting-priority" design mechanism. By analyzing the incompatibility of traditional design in aspects such as color system mismatch, dynamic environment loss of control, and lack of lens language, it proposes a mechanism transformation path centered on technical coordination, dynamic feedback, and quantitative evaluation. The research findings are as follows: (1) The introduction of digital twin technology and lens space thinking has significantly optimized the screen compatibility of design elements through pre-visualization and dynamic parameter adjustment; (2) The deep collaboration mechanism between the design team and the broadcasting team has addressed key issues such as color engineering calibration and material media control, ensuring the precise presentation of the brand image in broadcast footage; (3) A quantitative evaluation model based on the "broadcasting value/landscape cost" ratio has achieved dual improvements in resource allocation efficiency and communication effectiveness. This study constructs a dual-coordinated design framework of "physical space-broadcasting footage," expands the application boundaries of digital technology in landscape design, and provides a replicable design path for brand communication in future large-scale events.**

Keywords—Look design, Broadcasting-priority mechanism, Lens space thinking, Beijing Winter Olympics Games, Brand communication, Design quantitative evaluation

I. Introduction

As the world's largest sports event, the Olympic Games' visual identity system (Look of the Games, LOTG) has traditionally aimed to create an immersive on-site experience. Traditional design strategies emphasize the use of core graphics, color systems, and other visual elements to construct a visually impactful physical space. However, the iteration of media technologies has fundamentally changed the mode of sports communication. During the Tokyo 2020 Olympics, OBS produced over 9,500 hours of sports broadcasting content, and the Beijing 2022 Winter Olympics reached over 2 billion television viewers. In this digital shift, the outbreak of the COVID-19 pandemic has further accelerated this transformation. This change requires designers to rethink the design of the LOTG to ensure it meets the demands of broadcasting and digital screens.

Starting from the collaboration practice between the Beijing 2022 Winter Olympics visual landscape design team and the broadcasting team, this paper explores how to construct a broadcasting-oriented design mechanism. By establishing a collaborative working mechanism between the design and broadcasting teams, expanding the digital characteristics of design elements, optimizing key design parameters, and dynamically adjusting the output of production files, a "broadcasting-priority" design evaluation logic is formed. This updates the methodology of look of the Games design, provides screen experience optimization solutions for large-scale events, and enhances the global communication effectiveness of sports events.

II. Path Dependency and Limitations of Traditional Sports Visual Design

A. Historical Evolution of Design Paradigms

The visual identity system (LOTG), over 60 years, has developed a unique design system, including seven core elements, more than ten event-related items, and two event landscape specifications. These elements ensure the creation of an extreme sports atmosphere. This long-term mindset based on on-site audience experience and physical space construction has formed a "live immersion" - oriented design logic:

1) Physical space recognition: Based on color systems, core graphics, and sports icons, the combination of core elements constructs venue environmental recognition, forming a differentiated and systematic atmosphere shaping for different competition areas.

2) Large-scale visual coverage: Through giant landscape advertisements, building coverage, visual coating, artistic installations, and high saturation colors and dynamic lighting, it creates an experience beyond daily life, immersing the audience in the sports atmosphere.

3) Landscape continuity strategy: Outside the venue, the "venue-city" spatial linkage reinforces brand exposure through standardized landscape nodes such as continuous spray-painted advertisements, flags, and barriers; inside the venue, it forms differentiated landscape flow lines for different types of personnel, allowing everyone to feel the Olympic atmosphere at all times.

B. Incompatibility with Broadcasting

This "space creation priority" design logic has formed a historical path dependency in material selection, color management, and production processes, lacking foresight consideration of lens language, resulting in mismatches between preliminary design, later implementation, and actual broadcasting effects:

1) Color system mismatch: The design team usually produces physical materials based on the CMYK color space to ensure high-fidelity color reproduction of physical production items to electronic design files. However, the conflict between the CMYK engineering color and the RGB broadcasting color space causes color differences, especially in high-brightness colors, which can lead to visual fatigue

and missing content in broadcasts due to excessive saturation and brightness.

2) Loss of control in dynamic environments: To promote sustainable development, LED surrounding screens are widely used in modern venues, replacing traditional spray-painted backlit barriers. However, the effect variables generated by the screens are not included in design standards. The graphic presentation standards habitually use computer screen display as the benchmark, but deviations often occur in actual broadcasts, leading to overexposure and blank screens, causing the surrounding rich site barriers to appear blank in broadcasts. Taking the Wukesong Ice Hockey Arena as an example, the surrounding LED screens, due to brightness imbalance, created excessive contrast with the background environment, resulting in the loss of landscape images on the LED screens during broadcasts and affecting the viewing experience.

3) Lack of lens language: In lens broadcasts, the athletic performance is the main focus. The lack of optimization of lens language at various levels in landscape design leads to monotonous and missing content in broadcast images. Designers habitually consider lenses as a later factor, which makes the relationship between sports field landscapes and different media terminal video broadcasts lack coordination. It also makes the elements of venue visual images, such as color, graphics, position, size, and direction, lack systematic design and testing in relation to broadcast camera positions.

C. Limitations of Working Mechanisms

1) Technical collaboration gaps: The design team's disconnection from OBS broadcasting technical standards in the early design phase and insufficient collaboration between the design and broadcasting technical teams during the middle phase lead to mismatches between design standards and camera parameters..

2) Evaluation system bias: In the initial design schemes, the evaluation weight is mainly allocated to "cultural narrative integrity," with a lack of involvement in broadcasting image quality parameters and online feedback mechanisms.

3) Cost allocation imbalance: Traditional design allocates a large portion of the landscape budget to low-exposure areas, or even areas outside the lens, lacking quantitative standards for return on investment. This not only causes waste but also indirectly weakens the secondary communication effects of cross-media.

III. Construction Logic of Broadcasting-Priority Design Mechanism

A. Driving Factors of Paradigm Shift

Traditional sports visual design, centered on the physical space experience of on-site audiences, proposes a broadcasting-priority design mechanism driven by three changes: technological iteration, user behavior, and event value.

1) Technological drivers: Taking color system design as an example, the popularization of ultra-high-definition technology imposes higher requirements on color precision, forcing the transformation of traditional design standards. The difference between the traditional printing standard CMYK color space and the broadcasting screen standard RGB color space is amplified, making it necessary to prioritize the definition of "broadcasting-safe colors" and establish technical boundaries.

2) Changes in user requirements: The prevalence of screens has restructured the behavior mode of audiences shifting from "on-site immersion" to "screen interaction." Data shows that during the Beijing Winter Olympics, there were 3.2 billion participants on Olympic social media, 68 million unique users on the Olympic website and applications, 154.48 billion views of Winter Olympics-related works and topics on Kuaishou, and 164.5 billion views of videos related to the "Snow 2022" campaign on TikTok. Athletes' accounts gained over 40.75 million followers. This requires design elements to adapt to fragmented visual focal points, simplify and highlight the density of barrier graphics, meet multi-size cropping for horizontal and vertical screens, and ensure quick identifiability in secondary communication images.

3) Reconstruction of event value: Compared to traditional venue implantation, broadcasting footage has become the main battlefield for brand communication. Non-competitive stage footage reporting has gradually incorporated content that is popular among people, while online communication has built a high-speed channel for external communication. The efficiency of global digital communication takes precedence over local cultural expression in physical spaces. Moreover, in the post-event stage, broadcasting footage can constitute an effective visual database of event heritage, providing resources for continuous brand display and secondary image shaping.

B. Process Optimization of Design Pathways

1) Envisioning communication effects: Adjust the design thinking process by considering the application and online derivatives of design in broadcasting as prerequisites. Incorporate factors traditionally considered later, such as expected effects, derivative spaces, and audience interaction, as prior conditions for design, rather than relying solely on culture, history, concepts, or cultural heritage as the starting point for design.

2) Presetting technical interfaces and limiting boundaries: The development of broadcasting technology provides possibilities for the expansion of design forms. Core elements need to consider dynamics, digital interaction, and digital derivatives from the initial design stage, expand dimensions of expression, and leave sufficient application interfaces for broadcasting to maintain coherence between static and dynamic expressions. At the same time, it is necessary to define the scope of elements that cannot be broadcast or have insufficient screen effects to avoid significant costs due to inconsistent communication or large-scale changes later in the event preparation process.

3) Pre-visualizing lens images: Traditional design is based on the three-dimensional relationships of real space and the expression of actual effects. In lens-space-priority design, it is necessary to balance the complementarity of actual scenes and digital images. On the one hand, in the construction of actual scenes, consider the carrying capacity

of screen images. The actual size of screens is much smaller than the field of view, so it is necessary to balance the expressiveness of the brand image in close-up, medium, and long shots, while ensuring the completeness of the image expression. On the other hand, when combining with digital images, prioritize the sense of presence to avoid visual elements competing for focal points, causing layer confusion. Ensure the maximization of visibility of various elements, making the Olympic elements on broadcast images clear and identifiable. Pay special attention to the color contrast of landscape applications to ensure clarity even in black and white photographs.

4) Full-chain testing and feedback: Although broadcasting is the responsibility of the OBS team, the design team needs to closely collaborate with the broadcasting team and establish a full-process communication and feedback mechanism based on the event delivery plan (GDP) timeline. Conduct actual effect testing and verification to ensure the actual presentation of design elements is consistent with the overall brand design tone and the timely development and application of landscapes. Any deviations in effect and time delays will increase pressure on budget, human resources, and quality control.

C. Quantitative Design Evaluation Model

Venue Simulation System (VSS): Using digital twin technology to efficiently model sports venues, achieving high-fidelity and high-efficiency reconstruction of sports venues. This tool enables highly standardized and efficient semantic modeling of regularly shaped venues, laying the foundation for three-dimensional model data for large-scale event planning and operational design simulations. Within the system, a fully simulated scene appearance can be built in three-dimensional space, and numerous types of broadcasting cameras can be easily added. The focal length and viewing angle of cameras can be simulated and verified, maximizing the digital reproduction of the workflow of content production teams.

IV. Empirical Study of the Beijing Winter Olympics

The selection of Beijing Winter Olympics as a case selection is based on the following reasons：

A unique sample catalyzed by the pandemic: The Beijing Winter Olympics was the first global comprehensive sports event held on schedule after the global outbreak of COVID-19. Due to epidemic prevention policies, the event was managed in a closed loop with no on-site audiences, providing a unique sample for studying the association between broadcasting technology, visual design, and audience experience in a no-audience model. In a no-audience scenario, visual design needs to rely more on elements such as color contrast and dynamic graphics to convey information, avoiding dependence on audience reactions on-site, which prompts design strategies to tilt towards "screen adaptability."

Systematic application of broadcasting-priority design strategies: The Beijing Winter Olympics explicitly proposed the "broadcasting-priority" principle, optimizing the allocation of landscape resources inside and outside the lens by using television and digital media communication effectiveness as core indicators for visual system design. The design team collaborated deeply with the Olympic Broadcasting Services (OBS), establishing a "design-simulation-testing-feedback" mechanism. Design outputs were dynamically adjusted based on camera perspectives and image presentation effects to ensure a high degree of alignment between visual design and broadcasting needs.

Forward thinking and technical collaboration practices: The Beijing Winter Olympics brand image landscape was planned and refined in collaboration with OBS, seeking OBS's professional opinions on complex issues such as color selection and design details, and ensuring OBS's full participation in design testing. Through a real-time feedback mechanism, design parameters and broadcasting indicators were optimized in sync, ensuring the correct presentation of colors and design in broadcast images, thereby maximizing broadcasting effectiveness.

In the Olympic design practice, the following key design adjustments and implementation effects have been formed：

A. Reconstruction of Color Systems

Presetting Light Color Expression Effects: Given the development of media technology, the Beijing Winter Olympics design initially anticipated the demands of 5G technology and 4K, 8K ultra-high-definition broadcasting. This meant that what viewers saw would be clearer. To adapt to the requirements of clarity, the emblems and core graphics were not limited to pure color expression and planar representation. Dynamic possibilities were provided through multimedia gradient colors, enhancing visual richness and offering dynamic expression.

Adjusting Standard Colors Based on Broadcast Lenses: Before finalizing the color system and producing landscape application items, camera color testing was an essential task. On the one hand, design graphics were tested in different venue environments. On the other hand, test events provided an excellent opportunity for the brand image landscape design team and OBS to conduct indoor and outdoor venue tests. OBS could also provide guidance on the installation locations of landscape application items within competition venues to ensure that broadcasters could fully capture athletes' competition scenes.

Fig. 1. Design and OBS teams test in indoor and outdoor environments

TABLE I. FIRST OBS TEST FEEDBACK

Color Name & Value	*Test Performance*	*Broadcast Optimization Suggestions*	*Recommended Application Scenarios*
Glowing Red C0 M100 Y80 K0	Appears heavy in indoor ice rinks; excellent in outdoor snowy venues; pure colors without gradients perform better in close-up shots	Avoid white gradient parts, maintain pure colors where possible	Outdoor environments + fast snow sports (e.g., alpine skiing, ski jumping)
Sapphire Blue C100 M85 Y0 K0	Stable performance in both ice and snow venues, no color distortion under strong light	Maintain standard saturation	Indoor ice sports (e.g., ice hockey, curling, figure skating/short track, speed skating)
Ice Blue C70 M0 Y10 K0	Appears too light on ice and snow, severe detail loss under strong light	Not recommended for use	High-level stand decorations, non-FOP areas
Bamboo Green C86 M0 Y53 K0	Appears "thin" under broadcast lighting and strong sunlight	Enhance saturation and contrast	General auxiliary color (suitable for venue guidance systems, temporary facilities)

Fig. 2. In early tests, addressing the color conversion issue from RGB→ CMYK → TVRGB, the Olympic Broadcasting Services (OBS) team conducted camera tests on different primary color landscape designs (LOTG) under ice rink and snowy outdoor test conditions:

In OBS's test feedback, not only were actual broadcast performances and color adjustment suggestions provided, but scene adaptation strategies were also offered:

Environmental Adaptability: Graded application schemes were developed based on indoor and outdoor lighting differences, recommending that each venue select a primary color and achieve layering through brightness gradients while limiting multi-color applications to avoid color domain calibration conflicts.

Matching Motion Characteristics: Colors were selected based on the dynamic characteristics of different sports events, for example, Glowing Red was matched with high-speed snow sports.

Broadcast Engineering Optimization: Parameters such as brightness compensation and saturation enhancement were adjusted to address color distortion in broadcasts, which was a key focus in later designs.

The principle of "athlete-centeredness" is at the core of broadcast design. In sports broadcasting, the focus is on the athletes' faces and body forms, so it is necessary to enhance facial brightness while balancing the brightness of surrounding landscapes in design. Particularly in close-up shots of athletes' faces, white and highly reflective ice and snow surfaces can create significant color differences, requiring balanced parameters in design to optimize the presentation of landscape images.

Taking the application of white as an example, in the final design of the image landscape toolkit, based on the actual situation of broadcasting, "TV white" was used instead of traditional pure white (C0,M0,Y0,K0). Traditional pure white tends to cause camera overexposure in snowy scenes, whereas the Beijing Winter Olympics adopted "Snow White" with 10% gray compensation (C3,M4,Y14,K0), and adjusted the overall image brightness in combination with snow reflection. This optimization improved the recognition rate of FOP barrier images along the track, reducing glare and detail loss in athletes' facial focusing.

B. Visual Scale Control

Expansion of Graphic Features: In the development of basic design elements, the design team constructed a logical framework based on media expression. Through a dynamic generation mechanism, the team created the first dynamic core graphics in Olympic history. Traditional core graphics rely on complex static graphics, with specific application images formed by cutting portions. In contrast, parameterized design-generated dynamic core graphics are both a graphical interpretation and the core graphics themselves. Application images are obtained by cutting video frames from high-frame-rate videos, providing innovative ideas for image expansion. In the design of sports icons, in addition to static marks, standardized dynamic interpretations were also formed, ultimately delivering vector files and AE project standard files. After being provided to the Olympic Broadcasting Services (OBS), these were widely used in broadcast footage.

Landscape Rhythm Algorithm: In indoor and outdoor venue landscape designs, unique image designs are formed at different points, with images at various points echoing and complementing each other. To achieve this, it is necessary to calculate the frequency of appearance, rhythm, density, and scale of design elements. Taking outdoor events such as alpine skiing as an example, application items around the competition venue (such as obstacles, fences, banners/flags) need to cover long distances. It is recommended to mark the positions of items on CAD drawings and, based on the high-speed sliding characteristics, adjust element spacing, enlarge element sizes, weaken gradient color contrast, and make them more inclined towards pure colors, forming loose and clear image modules to ensure coherent and clear image expression while avoiding information overload and blurriness. Additionally, design effects should be adjusted based on lens focal lengths: long focal length lenses are suitable for single design elements (e.g., Olympic rings > emblem > seal), with coverage of over 60% but relatively blurry; medium focal length lenses are suitable for 2-4 design elements (Olympic rings > emblem > seal > slogan), with coverage of about 30% and clear images; wide-angle lenses feature more than four design elements, with coverage of about 20%, forming a clear gradient difference in size and quantity between elements. Indoors, the focus is on seals, Olympic rings, and emblems, while outdoors the focus is the opposite, with the number of seals, Olympic rings, and emblems exceeding that of sports icons and slogans.

Constructing Images Based on Broadcast Footage: In brand image decorative environments, the regional positioning of landscape elements and Olympic marks must follow strategic planning to ensure that Olympic and host city marks are clearly presented in television and photographic footage. Only by clearly understanding the relationship between (camera positions, furniture, referee positions, ceremonies, and temporary structures) and the competition venue can the precise identification and confirmation of brand image elements around the competition venue be accurately achieved. When determining the main elements of Olympic image and competition landscape applications, both broadcast footage and static photography requirements must be considered. Photographers should seek the best angles to

clearly capture the competition scene while fully presenting Olympic brand features. Therefore, before determining the application positions of landscape elements, early consultation with the venue broadcasting production team and OBS photographers is essential to obtain suggestions for optimizing broadcast colors and camera positions. Camera positions should be marked on venue technical drawings to ensure sufficient differences among important positions, avoiding repetitive footage. The landscape design of the Shougang Ski Jumping Platform at the Beijing Winter Olympics was premised on meeting broadcast lens requirements, with the classic footage of the cooling tower as the background for athletes' aerial jumps repeatedly appearing in broadcasts and photographs. Despite technical challenges in achieving this effect, the broadcast results significantly highlighted the unique charm of the Shougang Park industrial site. After repeated deliberation, the cooling tower giant emblem painting scheme was confirmed. To ensure the implementation of the design, the team utilized the Venue Simulation System (VSS) for design and verification. Through camera simulation technology and curved surface mapping technology, shooting was simulated, and the size and angle of the emblem painting were adjusted. The trajectory of athletes' aerial jumps was dynamically simulated to verify shooting angles, achieving the principle of "what you see is what you get." The final dimensions of the emblem painting were determined as 16.5 meters high, 13 meters wide, and 46 meters from the ground, and implementation was carried out accordingly.

Establishing Usage Norms: Given the significant responsibility of competition broadcasting and the need to communicate a consistent Olympic brand image to domestic and international audiences, it is necessary to establish broadcast brand guidelines for rights-holding broadcasters. These guidelines encourage Olympic broadcast partners to integrate Olympic elements such as marks, mascots, sports icons, and landscapes into diverse broadcast platforms and offline activities, assisting broadcasters in integrating Olympic elements with their marketing and promotion of sports broadcasts.

C. Material Media Control

Control of Production Material Quality: In material testing, the design team selected four types of materials to adapt to different occasions, including heat transfer mesh fabric, UV printed mesh fabric, warp-knitted fabric (nylon fabric), and adhesive-backed stickers. From the perspective of broadcasting, the Olympic Broadcasting Services (OBS) emphasized the importance of matte and non-reflective materials. Although all tested materials were suitable for television broadcasting in terms of non-reflective performance, special attention should be paid to avoiding the use of transparent materials when decorating complex structures frequently exposed to cameras. In particular, under strong sunlight, transparent materials can cause viewers to clearly see the structures behind them (such as scaffolding, cables, etc.), thereby affecting the visual effect.

Material Package Specifications: Given the large scale of the Winter Olympics, construction cannot be uniformly completed by a single production unit, which can easily lead to significant differences in the quality of production materials across different competition areas and venues. To ensure consistency and accuracy of materials and facilitate management and verification, the design team established a unified sample package. This package included standard color samples for all production materials used during the competition, serving as a basis for acceptance. This measure not only improved the efficiency of design management and ensured consistency in broadcast footage but also reduced resource waste and financial expenditure.

Overlooked Media: The widespread application of LED screens in modern venues has brought new challenges to broadcasting. Taking the Wukesong Stadium as an example, its surrounding LED screen barriers, while convenient for content presentation, caused overexposure and white screen phenomena in early test events due to graphic presentation standards based on computer screen display. This resulted in the surrounding rich site barriers appearing blank in actual broadcasts, affecting the viewing experience. To address this issue, it is necessary to comprehensively consider the luminous characteristics of LED screens and optimize visual effects by reducing screen brightness or adjusting graphic saturation. Additionally, given that screen positions are usually far from the competition area (FOP zone), the contrast between screens and the audience should be reduced to naturally integrate them into the overall long-shot image, thereby forming a unified and harmonious visual effect.

V. Promotion Value of the Broadcasting-Priority Design Mechanism

A. Restructuring of Design Logic

Under the broadcasting-priority mechanism, design logic has undergone a fundamental restructuring. Designers not only need to consider the time-dimensional characteristics of design elements at the basic element construction stage but also construct a dynamic visual grammar. Furthermore, three-dimensional space needs to be deconstructed into two-dimensional image language. Design logic is reshaped around parameters such as camera focal length, composition ratio, and dynamic frame rate, thereby achieving a transformation in design thinking from "space creation" to "image production." In the shaping of sports field landscapes, the traditional linear flow (outside the venue → inside passage → audience 席 → competition field → mixed interview) is deconstructed into fragmented montages of broadcast footage. Through a visual weight system of design elements under different lens focal lengths, brand information can be conveyed in a short time through any lens cut, fitting the laws of video communication and forming a screen-priority narrative logic.

B. Transformation of Design Evaluation

The broadcasting-priority mechanism promotes a shift in design evaluation from experiential judgment to a data-driven path. Through quantitative indicators provided by the broadcasting team, the design process can dynamically optimize landscape layouts, material adaptation, color parameters, and element scales, forming a full-process control system. Additionally, by calculating the indicator of the "broadcasting value/landscape cost" ratio, design resources can be prioritized for high-frequency lens coverage areas while reducing landscape budgets for non-core areas. This strategy not only improves design efficiency and quality but also significantly reduces later modification costs due to design non-compliance with broadcasting standards.

C. Application Potential in Urban Landscape Design

The broadcasting-priority design mechanism shows great potential in urban landscape shaping. By introducing a media

communication prediction mechanism, urban landscape design can significantly enhance the city's visual recognition and brand influence. By presetting communication effects in the initial design stage and treating broadcast applications and online derivatives as prerequisites, the presentation effects of urban design updates on different media platforms can be ensured, thereby guaranteeing brand image consistency and recognizability. Additionally, technical interfaces are established and restriction boundaries are set in the design process to ensure design elements adapt to different media communication needs, such as considering the performance of lighting, color, and materials under different ambient light to avoid visual distortion. Using lens space thinking ensures that urban landscapes maintain good visual effects under different shooting angles and distances. Furthermore, collaboration between digital media design teams and brand image landscape teams, along with the establishment of testing and feedback mechanisms, allows the use of venue simulation systems (VSS) to simulate and verify urban landscape designs, optimizing design outputs. These measures enable urban brands to more effectively leverage media communication power, enhancing global visibility and influence, and providing strong support for the economic and cultural development of cities.

VI. Conclusion

This study uses the Beijing 2022 Winter Olympics as an empirical case to systematically explore the logical reconstruction of look of the Games design from "on-site immersion" to "broadcasting priority" in the context of digital transformation. The research results show that the traditional design paradigm, due to technical path dependence and limitations in working mechanisms, struggles to meet the visual demands of broadcasting media, manifested in issues such as color system incompatibility, dynamic environment loss of control, and lack of lens language. By constructing a "broadcasting-priority" design mechanism, deep collaboration between the design team and broadcasters, dynamic optimization of technical standards, and data-driven evaluation models have significantly improved the screen compatibility and global communication effectiveness of sports images.

Firstly, the reconstruction of design logic is the core of mechanism transformation. It has been confirmed that setting broadcasting effects as the starting point for design, pre-visualizing lens footage through digital twin technology (VSS), and quantitatively evaluating lens coverage value can effectively optimize the visual weight and spatial layout of design elements. Secondly, the establishment of technical collaboration and dynamic feedback mechanisms has broken the limitations of the traditional design process centered on "physical space priority." Full participation of the OBS team, color engineering tests, and lens focal length adaptation strategies have ensured the precise presentation of design elements in broadcast footage. Finally, the quantitative transformation of the evaluation system has provided a scientific basis for resource optimization. By calculating the "broadcasting value/landscape cost" ratio, design resources can be tilted towards high-frequency lens coverage areas, while reducing redundant investments in low-exposure areas, thereby improving cost efficiency and communication effectiveness, achieving a paradigm shift from "physical creation" to "image production."

However, this study still has certain limitations: firstly, the empirical case is concentrated in a single event, and its special circumstances (closed-loop management, no-audience mode) may affect the generalizability of the conclusions; secondly, the rapid iteration of broadcasting technology (such as 8K ultra-high definition, VR panoramic broadcasting) imposes higher requirements for design adaptation, necessitating further exploration of the deep integration of dynamic graphics and interactive landscapes. Future research needs to verify the mechanism's longevity through horizontal comparisons of multiple Olympic Games and further explore the synergistic effects of media prediction mechanisms in urban landscape design, promoting the application of "screen-priority" design logic in broader public spaces. In summary, the broadcasting-priority design mechanism is not only an inevitable choice for the digital transformation of look of the Games but also provides a new paradigm for brand communication and visual storytelling in global large-scale events. Its core lies in user demand-driven, technology collaboration-supported, and data evaluation-guaranteed approaches to ultimately achieve the symbiosis and co-prosperity of physical space and digital media.

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