

Research on VR Content Generation and Services from the Perspective of Embodied Intelligence

Jinhong Liu¹, Qi Lai²

^{1,2} School of Law, Humanities and Sociology, Wuhan University of Technology, Wuhan 430070, China

ABSTRACT

VR publishing, as a new business model of immersive knowledge services created by publishing houses relying on virtual reality technology, generally faces practical bottlenecks such as superficial embodied interaction, fragmented service chains, and the separation of body and mind while reshaping users' physical presence experience. Based on the theory of embodied intelligence, this paper defines the core connotation of VR publishing services and user experience, and proposes an evolutionary theoretical model of VR publishing services from the perspective of embodied intelligence, revealing the collaborative evolution mechanism of physical body, surrogate body, avatar, and inner body. On this basis, the paper proposes optimization paths for publishing houses' VR publishing services from four dimensions: perception coupling of the four bodies, emotional state adaptation, cognitive load regulation, and risk prevention and control system. The research can provide theoretical support and practical reference for breaking the bottleneck of VR publishing experience, improving service mechanisms, and enhancing the core competitiveness of digital publishing.

Keywords: Embodied intelligence (EI), Virtual reality publishing (VRP), Service mechanism, User experience, Media narrative.

1. INTRODUCTION

Embodied Intelligence (EI) breaks through the cognitive limitations of traditional Artificial Intelligence (AI), which is detached from the body and isolated from the environment. It emphasizes the implementation of intelligence through real-time interaction between physical carriers and the environment, providing a new theoretical perspective for the deep integration of virtual reality technology and the publishing industry.[1] Virtual Reality Publishing (VRP), as a new business model in which publishing institutions rely on virtual reality technology to transform traditional knowledge content into immersive, interactive, and embodied digital publishing products, and provide full-process services such as content experience, knowledge learning, and interactive communication, is reshaping the production mode, interaction logic, and user experience form of digital publishing. In the VR publishing scenario, users are no longer passive recipients of abstract symbols, but participate in the narrative process and meaning construction through

physical actions, highly aligning with the core viewpoint of embodied intelligence that "cognition originates from the coupling of the body and the environment"[2].

Although China's virtual reality (VR) content creation market reached a value of 8.452 billion yuan[3] in 2024, and VR publishing has demonstrated diverse narrative forms and vast application prospects in fields such as education, children's content, science popularization, and cultural tourism, publishing houses still face significant experience bottlenecks and service shortcomings when scaling up their VR publishing operations. Currently, many VR publishing products still suffer from issues such as superficial embodied interaction, short average user dwell time, low flow state trigger rate, incomplete service chains, prominent physical and mental disconnection, insufficient experience coherence, and weak user stickiness.[4][5][6][7] These issues directly hinder the industrial implementation and value release of VR publishing.

Existing related research often focuses on single technical dimensions such as VR hardware upgrades and visual presentation optimization[8], or directly applies general media experience models, failing to conduct a systematic analysis based on the business scenarios and service logic of VR publishing in publishing houses. The existing research has neither clarified the four-dimensional functional boundaries and collaborative mechanisms of the physical body, avatar, embodiment, and inner body from the perspective of embodied intelligence, nor revealed the evolutionary law of virtual reality publishing services from basic embodied perception to deep flow experience. Furthermore, it lacks a targeted service optimization framework, making it difficult to effectively solve the core problem of the separation of body, mind, and environment in virtual reality publishing, and unable to provide precise support for publishing houses to build a high-quality virtual reality publishing service system.

In the context of embodied interaction profoundly reshaping the logic of virtual reality publishing services and user interaction methods, how to utilize four-body synergy to open up service links and enhance the depth of experience has become the key for publishing houses to advance their virtual reality publishing business. Based on this, this paper, grounded in embodied intelligence theory, defines the core connotation of virtual reality publishing services, constructs an evolution model of virtual reality publishing services and user experience from the perspective of embodied intelligence, reveals its internal mechanism, and proposes optimization paths for virtual reality publishing services from four dimensions: perceptual coupling, emotional adaptation, cognitive regulation, and risk prevention and control. The aim is to expand the application boundaries of embodied cognition theory in the publishing field and provide theoretical support and practical guidance for publishing houses to overcome the bottleneck of virtual reality publishing experience, improve service mechanisms, and enhance core competitiveness.

2. CONCEPTS OF VRP SERVICES AND USER EXPERIENCE FROM THE PERSPECTIVE OF EMBODIED INTELLIGENCE

The philosophical foundation of embodied cognition theory stems from Merleau-Ponty's

phenomenology of the body. Its core lies in breaking the traditional cognition that is limited to brain symbol computation, establishing the body as the cognitive subject, and generating perception, judgment, and meaning through dynamic interaction with the environment.[9] The extended mind theory proposed by Clark and others further expands this cognitive boundary, incorporating external tools such as digital devices into the cognitive system, forming a closed-loop cognitive architecture of body, tools, and environment, providing theoretical support for the interaction mode between body, devices, and content in VR publishing.[10] In narrative theory, narrative transmission theory further reveals that when the audience is deeply involved in the narrative world, their cognition and emotions will be highly integrated with the narrative content. This process is significantly amplified in the VR publishing environment due to the deep involvement of the body.[11] With the evolution of artificial intelligence technology, embodied intelligence transforms abstract intelligence into perceptible and actionable practical abilities through real-time interaction between physical carriers and the environment, providing support for the upgrading of VR publishing services from sensory stimulation to meaning construction.

The core essence of user experience lies in the comprehensive cognitive impression and emotional response formed by people when they use or anticipate using products, systems, and services.[12] In the realm of digital publishing, translating a user-centered philosophy into practical, implementable solutions remains a pivotal question for publishers seeking to overcome experiential bottlenecks[13] and build core competitiveness[14]. This question acquires new significance in VR publishing from the perspective of embodied intelligence, driven by innovations in technological forms and interaction logic. Compared to traditional digital publishing, VR publishing redefines the experiential paradigm through physical presence, transforming user experience from mere content reception and tool manipulation into a complex system deeply integrated with embodied characteristics.[15]

To this end, this article posits that VR publishing services and user experience from the perspective of embodied intelligence refer to the dynamic coupling mode of readers' body, device, and published content. Through the organic coordination and dynamic adaptation of the four-dimensional elements of physical body, avatar, surrogate body, and inner body, the essence of

experience is elevated from instrumental interaction to a process of meaning construction involving bodily participation. This process is highly aligned with the ternary interaction framework of user, narrative, and system in interactive narratology.[16] In the process of VR publishing services, users are not only recipients of content but also subjects who participate in content generation and meaning co-construction through bodily actions. That is, VR publishing services and user experience from the perspective of embodied intelligence are not simply digital replications of traditional content. Instead, publishers use technology to construct a cognitive coupling field between the physical body and virtual content, enabling users to complete the transition from passive sensory stimulation to active meaning generation through the coordination of the four bodies, ultimately achieving the integrated service value of senses, emotions, thinking, and action.

3. EVOLUTION MECHANISM OF VRP SERVICES FROM THE PERSPECTIVE OF EMBODIED INTELLIGENCE

To overcome the dilemma of physical, psychological, and contextual disconnection in VR publishing services, this paper constructs a theoretical model of VR publishing service evolution based on the essence of VR publishing services from the perspective of embodied intelligence, as shown in "Figure 1". The model includes four advanced stages: physical presence, task focus, value recognition, and flow unity. It provides theoretical support for publishers to break through the bottleneck of VR publishing experience, optimize and intervene in realistic and precise experience. The specific evolution mechanism is as follows:

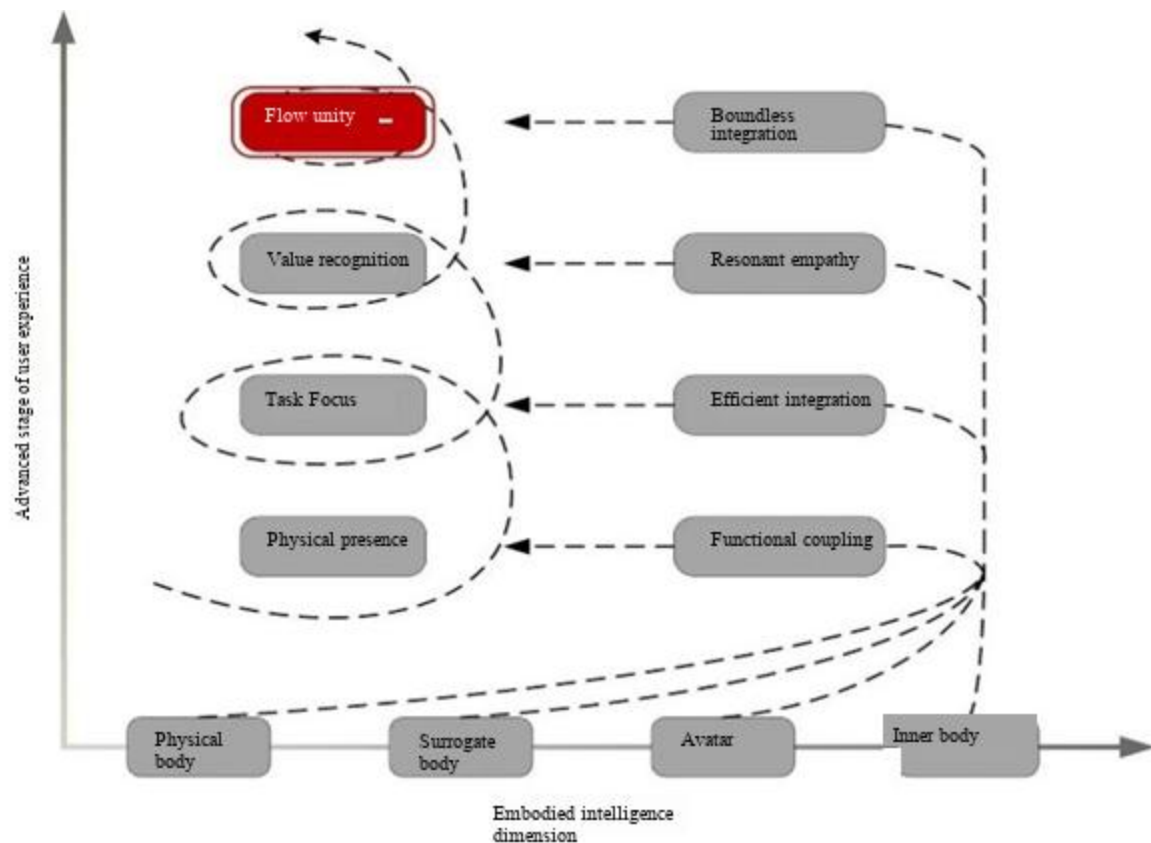


Figure 1 Theoretical model of VRP services evolution from the perspective of embodied intelligence.

Firstly, the model constructs physical presence through the coupling of four bodily functions, laying the physical and cognitive foundation for VR publishing services. From the perspective of embodied intelligence, the core value of physical

presence lies in completely breaking the cognitive separation of "body-mind duality" in traditional publishing.[17] Instead of viewing the body as a spectator of cognition, it transforms the service experience from brain decoding of symbols to

interactive generation between the body and the scene through the deep binding of the body and virtual publishing content, achieving an essential leap from instrumental interaction to existential participation. In this stage, the physical body uses physiological actions such as walking and touching as entry points for experience, reducing users' psychological resistance to unfamiliar virtual environments and providing perceptual anchors for virtual scenes. The surrogate body undertakes the core responsibility of bidirectional adaptation and translation, accurately solving the problem of adaptation between physical body movements and virtual feedback through technical means such as tactile gloves, establishing a perceptual pathway between reality and virtuality. The avatar completes user identity anchoring with an image that deeply fits the publishing content scene, synchronizing movements with the physical body in real time, strengthening the concrete cognition of "I am acting in the virtual scene". Driven by the dual impetus of scene immersion and action feedback, the inner body completes the shift of attention from the real world to the VR publishing content environment, actively filters out real-world distractions, and forms initial trust in the virtual publishing scene.

Secondly, the model achieves a deepened cognitive experience of VR publishing services by efficiently integrating and guiding task focus through the four bodies. From the perspective of embodied intelligence, task focus is the cognitive foundation of flow experience. Through the synergy of the four bodies, the VR publishing service experience is elevated from passive reception of sensory stimulation to active participation in meaning construction.[18] In this stage, users' attention is highly focused on the core learning and experience tasks of publishing content, achieving a seamless integration of operation and cognition. Time perception is distorted, and interference factors are effectively filtered, providing necessary conditions for subsequent emotional resonance and the formation of flow state. Among them, physical body actions are upgraded from exploratory to goal-oriented, forming muscle memory through high-frequency feedback from the avatar, and actions gradually become automated. The surrogate body is upgraded from a simple signal translator to a cognitive unloader, reducing cognitive consumption by dismantling complex publishing tasks and filtering redundant signals. The avatar is deeply designed around the content role, binding knowledge skills with physical body actions to strengthen the cognitive association of

"physical body is the role". The inner body achieves deep focus through task structural decomposition and interference shielding, enhancing task controllability and service immersion.

Furthermore, the model achieves value recognition through four-body resonance empathy, promoting the emotional sublimation of VR publishing services. From the perspective of embodied intelligence, value recognition serves as an emotional bridge for constructing flow.[19] When users generate value recognition for VR publishing content, they will form a strong motivation for participation and emotional investment, providing key emotional impetus for triggering the flow state. At this stage, the user experience shifts from "being asked to experience" to "wanting to experience", and attention automatically shifts from task execution to content meaning, creating conditions for the ultimate integration of flow. At this time, the feedback received by the physical body rises from task-related to emotion-related, with the surrogate body transmitting physiological sensations of pleasure or empathy through vibration; while enhancing the emotional authenticity, the surrogate body captures the physical body's physiological signals to inversely adjust the emotional intensity of the scene; the avatar visualizes emotions through expressions and actions, becoming a visual bridge for emotional resonance with the inner body; the inner body integrates atmosphere, expression, and physiological feedback, completing the transition from understanding emotions to engaging emotions, recognizing the value of VR publishing content, and forming a motivation for active service participation.

Finally, the model achieves flow unity through the seamless integration of the four bodies, realizing the ultimate value of VR publishing services. From the perspective of embodied intelligence, the flow state represents a deep alignment between the body and the meaning construction of virtual publishing content,[20] which is the advanced form of VRP services. In the flow state, users are no longer passive recipients of publishing content, but actively participate in the generation of content meaning through the seamless integration of the four bodies. This achieves an upgrade from functional satisfaction to spiritual pleasure and knowledge internalization. At this point, the physical body and avatar are fused to the extreme, with actions and emotions seamlessly connected, forming an identity cognition of "I am

the avatar"; the surrogate body becomes completely invisible, and the presence of the device disappears, becoming a natural extension of bodily perception; the inner body enters an optimal state where goals and processes coexist, and motivation shifts from completing tasks to enjoying the experience itself, truly immersing in the immersive knowledge and emotional experience brought by VRP services, achieving an advanced service state where "experience is self".

4. OPTIMIZATION PATH OF VRP SERVICES FROM THE PERSPECTIVE OF EMBODIED INTELLIGENCE

Based on the service evolution mechanism driven by the synergy of four bodies, combined with the core conditions triggered by flow state, this paper constructs an optimization system for VRP services in publishing houses from the perspective of functional adaptation of the four bodies, promoting a smooth transition of service experience to the flow unity stage, and solving the problem of the separation of body, mind, and environment.

4.1 Strengthening the Coupling of Four-body Perception and Building a Solid Foundation for Physical Presence

To alleviate the sense of disconnection from the digital body of VR publishing users, strengthen the cognitive coupling of physical presence, and lay a physical foundation for users' subsequent cognitive immersion and emotional resonance, publishing houses should enhance the natural mapping and perceptual synchronization of body movements in the development of VR publications from the following two aspects.

On the one hand, it is to optimize action mapping and identity binding to enhance the synergy between the physical body and the avatar. The natural mapping and perception synchronization of body actions are the core foundation of VRP user experience. The consistency of perception and action can effectively resolve the separation between virtual and real bodies and enhance the immersive experience.[21] Therefore, VR publishing content should adopt high-precision, lightweight surrogate body devices to accurately capture users' subtle movements, control action mapping errors within an imperceptible range, achieve millisecond-level linkage between the avatar and the physical body,

and strengthen the identity cognition of "I am the avatar". At the same time, the VRP provide avatar customization and action sensitivity adaptation for users of different ages to reduce resistance in unfamiliar environments, and embed an action fault tolerance mechanism to filter unintentional misoperations, helping the inner body establish trust in virtual scenes.

On the other hand, a multimodal perception closed loop should be constructed to enhance the feedback coordination between the surrogate body and the physical body. Multisensory consistent feedback serves as the physiological foundation for achieving the sense of realism in human-computer integration[22]. Publishing houses should focus on the coordination of vision, touch, and hearing, and build an avatar-led multisensory feedback system. For instance, at the tactile level, gloves and vibrating seat cushions can be used to convey physical sensations; at the auditory level, 3D spatial sound technology can be employed to accurately match footsteps, environmental sounds, and the physical body's movement trajectory; and at the olfactory level, odor generators can be configured for specific scenarios to supplement the user's sensory dimensions and enhance the cognitive realism of human-computer integration. Through these various methods, multisensory consistent feedback can promote deep coupling between the physical body, surrogate body, and publishing content, thereby consolidating the foundation of embodied perception.

4.2 Dynamically Adapting to Emotional States and Promoting the Sublimation of Value Recognition

The user's emotional state is the core variable determining the depth and quality of VR publishing services. Publishing houses should rely on the logic of four-body resonance and empathy, and through the collaborative operation of surrogate body emotion capture, avatar emotion embodiment, and inner body emotion integration, establish a deep connection between emotion and content, providing emotional motivation for flow triggering.

On the one hand, it relies on surrogate body to build a non-invasive emotion perception system. When designing VR publishing services, publishing houses should use surrogate body as the technical carrier, integrating non-invasive modules such as eye tracking, skin conductance sensors, and heart rate monitoring to construct a multi-dimensional physiological index collection system, providing

data support for accurate identification of emotional states.[23] Specifically, eye tracking can be used to capture data such as pupil dilation amplitude and gaze duration to identify user interest points and tension levels; skin conductance sensors can be used to monitor conductivity fluctuations in real time to capture subconscious emotional changes; and heart rate monitoring can be used to distinguish user emotional tones such as relaxation, calmness, and stress based on user heart rate data. Furthermore, based on the above data, a multi-modal emotion recognition model can be constructed to accurately quantify core emotional states such as pleasure, anxiety, and boredom, providing objective basis for subsequent dynamic adaptation and avoiding the one-sidedness of single indicators.

On the other hand, it is essential to achieve four-body collaborative emotional guidance and dynamic adaptation. When designing VR publishing services, publishing houses should take the closed-loop interaction between emotions and the environment as the core. Through the collaborative linkage of avatars, surrogate bodies, and virtual scenes, precise responses and guidance to users' emotional states can be achieved, clearing emotional barriers for triggering and maintaining a flow state. For example, when positive emotions are recognized, the surrogate body can enhance the pleasure feedback through "gentle vibration", the avatar synchronously presents expressions and actions that fit the mood, and the scene automatically advances to a high-value narrative node, deepening emotional resonance. When negative emotions such as anxiety and boredom are detected, the surrogate body can reduce the intensity of stimulation, the avatar guides with a soothing posture, and the scene switches to low cognitive load buffer content. After the mood stabilizes, it returns to the core narrative. In addition, emotional states should be tied to task difficulty to form a positive cycle and maintain the continuity of emotional engagement.

4.3 Focusing on Cognitive Load Regulation and Deepening Task Focus Experience

Cognitive fluency is the core requirement of VR publishing services. Publishing houses should optimize content logic and task design through the synergy of reducing burden on the surrogate body, empowering the avatar, and guiding the inner self, thereby reducing cognitive consumption and

promoting the integration of experience and cognitive fluency.

On the one hand, a dynamic content service framework driven by four bodies should be established. To enhance user engagement, VR publishing should be supported by narrative cognition, embodied cognition, and self-determination theory, and a user-driven dynamic content service framework driven by both embodiment and narrative should be constructed.[24] To this end, when designing VRP services, publishers should first rely on avatar collection to gather data such as body interaction frequency and visual focus, intelligently identify inner body interest preferences, and generate personalized storylines to accurately meet the needs of the inner body. Secondly, multi-level storyline branches should be generated based on interest points, deeply binding body action feedback, avatar growth trajectory, and storyline progression. Finally, avatars should be designed to fit the image of task roles to strengthen identity recognition, allowing users to transform from content receivers to content builders, thereby activating users' exploration motivation and reducing cognitive resistance.

On the other hand, the adoption of a tiered cognitive load regulation strategy enhances the focus of the inner body. When designing VR publishing services, publishers should achieve precise regulation of cognitive pressure on the inner body through information filtering, task structural decomposition, and dynamic load adaptation, clearing cognitive barriers for cognitive immersion and flow states. Specifically, complex tasks can be decomposed into tiered subtasks. After completing each subtask, the avatar provides real-time feedback on progress through a visual progress bar, and the surrogate body simultaneously provides tactile cognitive feedback such as vibration upon task completion, to enhance the sense of task controllability of the inner body and reduce the external cognitive load of the user. Furthermore, when detecting cognitive overload of the inner body, methods such as filtering redundant sensory information, simplifying the operation interface, and hiding non-core function buttons can be employed to reduce cognitive consumption of the inner body, avoiding distraction and interruption of cognitive immersion caused by information overload.

4.4 Establishing a Risk Prevention and Control System, and Stabilizing the State of Flow Unity

The flow state represents an advanced form of VRP services, which necessitates the four-body coordination to mitigate risks such as experience interruptions, emotional overload, and cognitive dependence, ensuring smooth transitions and stable maintenance of services. Publishing houses should establish a comprehensive risk prevention and control system.

The first is to actively prevent and repair experience interruptions to ensure the continuity of user cognition. During the VRP user experience, interruptions often occur due to equipment issues or other reasons. Therefore, when designing VRP services, publishers should build a multi-scenario interruption response system based on the principle of perception and action consistency. At the equipment level, an emergency plan for surrogate body equipment malfunctions should be established. When motion capture fails, it should automatically switch to simplified modes such as voice control and gaze manipulation to avoid technical failures that disrupt the experience. When faced with external interference, the system should be able to automatically pause the experience and save the current state. After restarting, it should quickly awaken the inherent body's cognitive memory of the scene through methods such as "avatar retracing task progress and surrogate body recreating key tactile feedback", restoring the continuity of emotion and cognition and helping users quickly return to an immersive state.

The second is to actively prevent and control user emotional overload to buffer the emotional impact on users. Emotional overload often occurs when the multimodal stimulation of the virtual environment or the emotional intensity triggered by published content exceeds an individual's coping threshold.[25] Therefore, when designing VRP services, publishing houses should establish a prevention and control chain of "preset threshold - real-time monitoring - collaborative buffering". Specifically, in the preset stage, a customizable emotional safety threshold function should be provided, allowing users to set their acceptance level for intense emotional scenes; in the real-time stage, emotional overload signals can be captured through surrogate body to automatically activate the buffering mechanism; in the execution stage, negative emotional impact can be mitigated through collaborative means such as "filtering high-intensity

emotional stimuli with avatars, presenting soothing actions with avatars, and switching scenes to low emotional load spaces", to avoid disruption of flow.

The last is to balance the cognitive boundaries between virtual and reality, and avoid cognitive dependence. Cognitive dependence refers to a state where individuals, after long-term reliance on external carriers such as virtual environments for cognitive activities, experience a weakening of their independent cognitive abilities and develop a persistent psychological dependence on these external carriers.[26] Therefore, when designing VRP services, publishing houses must establish a mechanism to guide cognitive boundaries between virtual and reality to strengthen reasonable guidance for users. For long-term usage scenarios, it is necessary to remind users of the boundaries between virtual and reality by displaying real-time clocks and thumbnails of the real environment at regular intervals. In terms of usage duration control, it is also necessary to set up an intelligent reminder function. When the continuous usage duration reaches a preset threshold, prompt users to pause their experience through surrogate body prompts or gentle vibrations, avoiding excessive dependence of the inner body on the virtual identity and balancing the cognitive and behavioral boundaries between virtual experience and real life.

5. CONCLUSION

The evolution of VR publishing services from the perspective of embodied intelligence is essentially a dynamic process where the collaborative relationship among the physical body, avatar, surrogate body, and inner body transitions from functional division to boundary dissolution, ultimately forming a boundaryless fusion state where "the physical body is the avatar, the surrogate body is an extension, and the inner body is the experience". This paper breaks through the shackles of traditional body-mind dualism, based on the practical scenario of publishing houses engaging in VR publishing business. With the collaborative framework of the four bodies as the core, it systematically reveals the progressive evolution mechanism of VR publishing services from embodied perception, task focus, value recognition to flow integration. It also constructs an optimized path for VR publishing services that adapts to the publishing industry, focusing on four dimensions: coupling of four-body perception, adaptation of emotional state, regulation of cognitive load, and risk prevention and control

system. This provides theoretical support and practical guidance for addressing current practical bottlenecks such as superficial embodied interaction, separation of body, mind, and soul, and incomplete service chains in VR publishing, while further expanding the application boundaries of embodied intelligence theory in the field of digital publishing.

In the future, with the deep integration of cutting-edge technologies such as brain-computer interfaces, generative artificial intelligence, and multimodal perceptual interaction with VR publishing, publishing houses can further open up the entire chain of content production, embodied interaction, knowledge services, and user operations by relying on the four-in-one collaborative mechanism. This will promote the upgrading of VR publishing from "immersive experience" to "cognitive fusion service", achieving a leap from content digital replication to knowledge embodied construction. At the same time, differentiated VR publishing service systems for niche areas such as educational publishing, professional publishing, children's publishing, and cultural tourism publishing will gradually be improved. While strengthening users' knowledge internalization, emotional resonance, and value recognition, they will continue to release the industrial and cultural value of VR publishing, injecting new impetus into the high-quality development of digital publishing in the new era.

ACKNOWLEDGMENTS

Funding: Research results from the 2021 major project of the National Social Science Fund of China, "Research on Virtual Reality Media Narration" (21&ZD326).

REFERENCES

- [1] Du Fangwei, Pei Yonggang, Research on Building the Ecosystem of China's Virtual Reality Media Narrative Industry [J]. View on Publishing, 2023(7): 35-42.
- [2] Xu Shuai, Who is the Actor? The Hybrid Subject and the Re-configuration of Actor-Networks in Embodied Journalism [J]. The Press, 2025(11): 26-35.
- [3] Research Report on China's Virtual Reality Content Creation Market: Current Status, Development Level, and Trend Analysis [EB/OL] [2025-11-12] <https://dxpress.gelonghui.com/p/2587854>
- [4] Sun Cuiqi, Yang Yang, Immersive Narration and Interactive Design of Children's VR Science Popularization Books Driven by Embodied Cognition[J/OL]. China Digital Publishing, 1-9[2026-04-15]. <https://link.cnki.net/urlid/10.1917.g2.20260414.1133.018>.
- [5] Zhou Rongting, You Lina, Zhou Shihan, etc., AIGC+VRM: An Exploration of Innovative Application Strategies for Digital Publishing [J]. Digital Publishing Research, 2024(2): 119-124.
- [6] Luo Ting, Space in Virtual Reality Media Narrative from the Perspective of Affordance [J]. Publishing Journal, 2023(3): 85-93.
- [7] Zhou Jianxin, Li Lingfei, Immersive Reading and Its Implications for Digital Publishing [J]. Modern Publishing, 2025(4): 73-80.
- [8] Fang Wei, Fu Yuxiang, Metaverse: An Overview of Concept, Technology, and Application Research [J]. Journal of Nanjing University of Information Science & Technology, 2024(1): 30-45.
- [9] Xu Lifang, Tian Zhengzheng, He Qian, A Review of Virtual Reality Media Research [J]. Publishing Journal, 2022(6): 77-89.
- [10] Feng Xuegang, Cheng Xin, Culture-Tourism Metaverse: Evolutionary Path and Industrial Logic [J]. Shanghai Journal of Economics, 2022(7): 70-83.
- [11] Chen Xianhong, Yuan Wenxia, Narrative Effect and Enhancement Strategy of Short Video in Telling Stories of Communist Party of China [J]. Modern Publishing, 2023(4): 20-32.
- [12] Yu Qing, User Experience Research on Digital Publishing Products [J]. Editorial Friend, 2012(10): 83-85+91.
- [13] Yuan Xiaoqun, Kang Qiyao, Research on Data-intelligence Empowering Smart Publishing Knowledge Services [J]. 2023(2): 21-28.
- [14] Qin Yuming, Bai Xiaoqing, Yang Liping, The View of Publishing Education Practice in the Digital-Intelligent Era:Theoretical Origins and

- Practical Trends [J]. Modern Publishing, 2026(2): 12-21.
- [15] Liu Jinhong, Chen Jiantong, Wang Yixue, Interactive Narratives in the Era of Intelligent Media: The Current Situation and Future of E-books [J]. Publishing Journal, 2025(6): 63-71.
- [16] Guo Zichun, Embodied Interactive Narrative:an Experiential Interpretation of the Narrative in the Era of Artificial Intelligence [J]. Journalism & Communication Review, 2022(2): 23-34.
- [17] Wang Mingjie, Yu Guoming, Reconstruction of Narrative Paradigms in Intangible Cultural Heritage Documentaries Enhanced by Generative AI:An Analysis of Practical Patterns in“New Media Breeding New Civilizations” [J]. Journal of Ethnology, 2026(3): 143-152+166.
- [18] Liu Yingying, Review of AI-Based Immersive Design [J]. Packaging Engineering, 2025(20): 1-15+43.
- [19] Duan Yucong, An Exploration of Embodied Intelligence Models from the Perspective of Semantic Autonomy [J]. Journal of Xinjiang Normal University(Philosophy and Social Sciences), 2026(2): 93-102.
- [20] Su Mier, Tracing the Origin and Spatiotemporal Evolution of the "Interactive Immersion" Theory in VR Imaging [J]. China Publishing Journal, 2022(3): 36-40.
- [21] Liu Bin, Zou Xin, Xie Weiyi, Imagined Presence, Sensory Reproduction, and Technological Embodiment: Transformations of News Rhetoric in the Era of Intelligent Communication [J]. Journal of Southwest Minzu University(Humanities and Social Sciences Edition), 2026(1): 170-178.
- [22] Huang Long, Elaborationg on the Formation and Characteristics of Multi-sensory Perceptual Behavior in VR Imagery from a Phenomenological Perspective [J]. Literary and Art Weekly, 2023(24): 86-89.
- [23] Peng Lan, Blending of Virtual and Real: Space and Body in the Metaverse [J]. Journalism Research, 2022(6): 1-18+119.
- [24] Xu Lifang, Zhou Yi, Research on Narrative Subject of Virtual Reality Media: The Perspective of Story Generation [J]. Academic Journal of Zhongzhou, 2023(12): 158-164.
- [25] Zhou Yong, Guo Peizhen, An Analysis of the “Simulation” Empathy Mechanism in VR Images [J]. Movie Review, 2024(18): 1-6.
- [26] Sparrow, Betsy, Jenny Liu, Daniel M. Wegner. Google Effects on Memory: Cognitive Consequences of Having Information at Our Fingertips[J]. Science 2011(6043): 776-778.