International Journal of English Literature and Social Sciences
Vol-10, Issue-5; Sep-Oct, 2025

Peer-Reviewed Journal
Journal Home Page Available: https://ijels.com/
Journal DOI: 10.22161/ijels

The Paradigm Shift in Smart Guides: How Advancing AI is Reshaping the Industry's Future

Xia Yongjie, Chu Chunyan

Beijing Institute of Petrochemical Technology, Beijing, China

Received: 18 Aug 2025; Received in revised form: 16 Sep 2025; Accepted: 23 Sep 2025; Available online: 28 Sep 2025

Abstract— *This study moves away from simply listing technological features and argues that smart guided systems are undergoing a fundamental shift in how they function—evolving from being "tools" to becoming "environments." By tracing a three-stage process driven by AI, we show how these systems have developed: starting as automated tools focused on efficient information delivery, then becoming interactive assistants that try to understand user intent, and finally emerging as immersive environments embedded in physical space. We further suggest that future progress should concentrate more on tackling ethical challenges and experiences of alienation brought by advanced intelligence, rather than only pushing for better technology. This paper provides a new way of understanding how smart guided systems are changing and raises important questions for the industry's sustainable development.*

Keywords— ***Artificial Intelligence, Smart Guided Systems, Paradigm Evolution, Media Theory, Ethical Paradoxes***

I. INTRODUCTION: FROM TECHNOLOGICAL EVOLUTION TO PARADIGM SHIFT

In the research field of smart guided tours, existing literature predominantly focuses on discussions of technical applications (Huang et al., 2022) or quantitative analysis of user experience (Liu et al., 2020), yet often lacks in-depth reflection on its essential evolution. The iteration of artificial intelligence technology is not merely an accumulation of functions—it represents a fundamental paradigm revolution in how smart guided systems function as a medium. This paper argues that smart guided tours are undergoing a profound transition from an instrumental medium to an environmental medium: evolving from a passive tool for information delivery to an active, immersive environment that shapes the visitor's experience.

At the heart of what we are exploring in this paradigm shift is a fundamental change in how technology functions: we see that it's no longer just delivering content—it's actively shaping how visitors engage with and interpret cultural heritage. Moving beyond conventional research that mainly breaks development down into time-based stages, we propose an "instrumental-environmental" framework to better understand how smart guided systems are evolving. We believe this approach not only helps uncover the motivations behind their transformation, but also offers meaningful insights that can guide future work in the field.

II. THE EVOLUTIONARY TRAJECTORY OF SMART GUIDED SYSTEMS

2.1 The Instrumental Medium Stage: Efficiency-Oriented Automated Extension

In their early forms, smart guided systems essentially served as digital stand-ins for human tour guides. They were designed mainly to make information delivery more efficient and standardized. A good example of this is the audio guide devices first introduced by the Palace Museum back in the late 1900s. By digitizing recordings and letting visitors choose what to listen to, these devices tackled very practical problems—like not having enough live guides or dealing with guides who offered inconsistent interpretations. It was a simple but important move toward making cultural sites more accessible.

Yet these early systems were far from perfect. Their one-way, broadcast-style design meant users could only passively receive content—there was no way to interact, customize what you heard, or choose your own path. This lack of agency made the experience feel more like a lecture than a conversation, limiting visitors' ability to personally connect with or explore the culture around them.

What's more, audio, images, and text often operated separately rather than blending into a cohesive multimedia experience. But the bigger issue was how these systems reduced cultural heritage into prepackaged bits of standardized information—overlooking what people truly seek in a cultural visit: emotional resonance, a sense of connection, and the freedom to explore on their own terms. In striving for efficiency, this technically rational design ironically ended up creating more psychological distance between visitors and the culture they came to experience.

2.2 The Transitional Medium Stage: Preliminary Contextualization through Interaction

With the maturation of mobile internet and artificial intelligence technologies, smart guided systems began transitioning from an instrumental medium toward an environmental one. The breakthrough in this phase lay in systems' initial attempts to "understand" the user and their context, thereby providing corresponding content services.

A clear example of this shift can be seen in the guided system deployed for the "Origins of China" exhibition at the Shanghai Museum, which we have studied as an indicative case of transition. By incorporating large language model technology, we observed that the system did more than just respond to factual queries—it also handled open-ended questions like, "What ritual and musical systems does this bronze relic represent?" We see this as a meaningful departure from pure information retrieval toward active knowledge building. What impressed us most was its ability to adapt responses based on follow-up questions, continually refining the depth and perspective of its answers. From our perspective, this represents an important step toward building a fluid, dialogic context between the system and the user.

Nevertheless, in our observation, smart guided systems at this stage still exhibited several distinct limitations. We noticed that most interactions remained user-initiated—the systems themselves lacked the ability to proactively sense environmental changes or adapt to situational cues. What's more, although various media forms like audio, imagery, and text were incorporated, they often failed to blend into a cohesive whole. Rather than a seamless flow, the experience came across as fragmented—what we might call "functional patchwork."

This was particularly clear in cases like the Liangzhu AR-guided cart project in Hangzhou. While the augmented elements were engaging, we observed a tangible gap—almost a "digital divide"—between the virtual reconstructions and the physical environment. It became evident to us that true integration between the digital and the real had not yet been achieved.

2.3 The Environmental Medium Stage: Seamlessly Integrated Immersive Experiences

Currently, smart guided systems are advancing toward a new paradigm of the environmental medium. At this stage, technology is no longer merely a "tool" to be used—it becomes the very "environment" of the visitor experience: ever-present yet imperceptible, actively providing well-timed information and interaction through multimodal sensing and real-time computing.

The "Digital Dunhuang" project by the Dunhuang Academy offers a preliminary manifestation of this paradigm. By employing ultra-high-resolution digital capture, AI-powered knowledge graphs, and VR virtual experiences, the project constructs a "digital cultural environment" that transcends physical and temporal

constraints. Visitors no longer merely "observe" the murals; they can "enter" the historical context of the caves, and even engage in the reinterpretation and sharing of cultural symbols through the "Dunhuang Poetry Scarf" mini-program. Here, the smart guided system is no longer an external "tool," but an intrinsic part of the presentation and experience of cultural heritage.

The key characteristics of this environmental medium are its adaptability and generativity. The system can continuously learn from user behavior and environmental data to dynamically adjust its content delivery strategy. More importantly, it is capable of generating unprecedented experiential content based on specific contexts—such as tailoring interpretive emphasis according to the real-time composition of the audience, or optimizing AR reconstruction effects in response to lighting conditions. Thereby, the smart guided system evolves into a dynamic interface connecting physical space and digital meaning, individual experience and cultural tradition.

A compelling example of this new approach can be found in the smart guided system deployed throughout the ancient city of Quanzhou, China. Its "AI Tour Quanzhou Ancient City" mini-program seamlessly combines a large language model with digital human technology, giving rise to a virtual guide named "Hehe." From our observation, this digital persona delivers not only 24/7 cultural narration and travel advice but also offers context-aware explanations based on a visitor's real-time location. What stands out in our analysis is the itinerary planning feature, which achieved a 92% user satisfaction rate. We see this as strong evidence that the system is moving beyond mere functional interaction toward what might be called "contextual companionship"—capable of interpreting nuanced visitor preferences.

At the same time, the related "Tour Quanzhou with One Phone" mini-program provides free audio guide services covering 107 attractions. With over 5 million cumulative users and monthly activations reaching 800,000, we believe these numbers clearly demonstrate the scalability and growing public acceptance of this environment-based service model.

III. FUTURE DIRECTIONS: ETHICAL DILEMMAS AND SOLUTIONS IN THE PARADIGM SHIFT

The paradigm shift of smart guided systems toward an environmental medium presents not only technological challenges but also gives rise to a series of profound ethical and experiential dilemmas. These issues are poised to become key constraints influencing future development.

3.1 The Personalization Paradox: Precision vs. Narrowing

While big data-driven personalized recommendations enhance service accuracy, they may also lead to "narrowing" and "fragmentation" of the user experience. Taking the algorithms of current mainstream platforms as an example, systems tend to recommend content aligned with users' existing preferences, inadvertently limiting opportunities to explore unknown domains. In the context of cultural guided experiences, this risks trapping visitors within "filter bubbles" of their own preferences, reducing exposure to diverse cultural perspectives.

We argue that resolving this paradox requires the design of a "defamiliarization-based recommendation" mechanism. Rather than only reinforcing existing preferences, such a system would intentionally introduce elements of uncertainty, randomness, and cross-disciplinary content—even while acknowledging user interests. In our view, this approach could help preserve openness and encourage exploratory behavior, offering a more reflective and expansive user experience.

3.2 Immersive Alienation: The Tension Between Digital Representation and Authentic Perception

While AR/VR technologies significantly enhance immersive experiences, we observe that they also risk creating a sense of "perceptual isolation"—separating visitors from the actual cultural artifacts. Take, for example, the Liangzhu AR guided cart project: its digital reconstruction of the ancient city is technologically impressive, but it also makes us wonder—how can we prevent such interpretations from becoming overly entertainment-focused? How do we ensure that digital enhancements do not dilute a visitor's sense of awe and meaningful engagement with the authentic site?

We argue that future smart guided systems must deliberately integrate a principle of "authenticity

preservation" into their design. This could be realized through methods such as "strategic voids"—leaving certain elements intentionally undigitized—and "reflective prompts" that gently remind users of the line between digital simulation and historical reality. In our view, these interventions can help maintain critical and reflective engagement, even within highly immersive environments.

3.3 Data Ethics: Balancing Personalization and Privacy

The environmental medium model depends heavily on continuously gathering and analyzing user data—from location and behavior to even physiological signals. Services like the Dunhuang Academy's mini-program rely on this information to enhance user experience, but it also raises serious ethical questions: Who controls this data? How do we prevent it from being exploited commercially? And could cultural immersion unintentionally become a form of surveillance?

We believe a viable path forward may lie in the concept of "data trusts." In this model, neutral third-party organizations would manage and protect user data under clear ethical protocols. Crucially, users would maintain real agency over their information—not only granting explicit consent before it's used, but also possibly receiving fair compensation when their data contributes to service improvements.

IV. CONCLUSION AND DISCUSSION

By retracing the development of smart guided systems, we argue that a fundamental transformation has taken place—from an "instrumental" to an "environmental" medium. This shift is not just technological but conceptual, enabling a deeper understanding of how these systems shape social and cultural encounters beyond purely functional uses.

Our findings suggest that this evolution involves more than incremental upgrades: it reflects a rethinking of what a medium can be. Rather than focusing only on technical specs like accuracy or speed, we encourage designers and researchers to confront the deeper tensions this change brings forward: How can we offer personalization without limiting exploratory freedom? How do we build immersion without compromising authenticity? And how can we use visitor data responsibly without violating trust?

It is also important to acknowledge the limitations of this study. Our analysis draws primarily on observations from consumer-oriented applications, and the proposed framework may not fully capture the evolution of smart guided systems in specialized domains such as industrial or medical contexts. Furthermore, the absence of a standardized evaluation system for environmental media makes it difficult to quantitatively assess how fully different projects embody this new paradigm.

Moving forward, we see three promising directions for research: developing a set of measurable indicators to evaluate the "environmentality" of guided systems; carrying out longitudinal studies to examine how this shift influences public engagement with cultural heritage; and designing ethical, compliance-driven solutions using emerging approaches like privacy-preserving computation and federated learning.

We believe that only by integrating technology, design, and ethical thinking can smart guided systems truly evolve from being "efficient tools" to becoming "meaningful environments"—ultimately enriching rather than overshadowing the human cultural experience.

REFERENCES

[1] Chen, S. H., Qin, Y., Yang, H. H., et al. (2025). Research on Optimization Strategies for Scenic Spot Guidance Based on Large Models and Multi-source Data Fusion—A Case Study of the Shunan Bamboo Sea. *Computer Science and Application*, *15*(8), 104-118.

[2] McLuhan, M. (1964). Understanding Media: The Extensions of Man. McGraw-Hill.

[3] Ukpabi, D. C., Aslam, B., & Karjaluoto, H. (2019). Consumers' acceptance of information and communications technology in tourism: A review. Telematics and Informatics, *41*, 97-110.

[4] Zhang, W. P., Li, Z. X., Wang, S., et al. (2023). *An itinerary planning and intelligent guide system based on multimodal large model: CN116823535B* (Patent). October 24, 2023.

[5] Zhong, F. Y., Zhang, C. B., Zhu, X. L., & Li, Y. L. (2025). Research on the Optimization of Museum Intelligent Guide Systems from the Perspective of Tourist Demand—Case Studies of the Guilin Museum and Yulin Museum in Guangxi. *Interdisciplinary Science Letters*, *9*(4), 461-471.

[6] Zuboff, S. (2019). The Age of Surveillance Capitalism: The

Fight for a Human Future at the New Frontier of Power. PublicAffairs.

[7] Sun, J., & Wang, K. (2021). Research on user experience design of immersive guided systems in the context of smart tourism. *Packaging Engineering*, *42*(16), 1-8.