https://doi.org/10.62836/jissh.v3i3.0020

Global Science Publishing

JISSH

Journal of Integrated Social Sciences and Humanities

https://ojs.sgsci.org/journals/jissh

Article

The Impact of AI-Guided Service on Museum Reputation

Yumeng Yang

School of Media and Communication, Shenzhen University, Shenzhen 518060, China

Abstract: This study explores the impact mechanism of AI-guided service on museum reputation in the digital era from the perspective of public relationship management, supported by Uses and Gratifications Theory. AI-guided service integrates natural language processing, multimodal interaction, VR/AR, and other emerging digital technologies to provide instant, immersive, and personalized interpretation for museum visitors. Based on Uses and Gratifications Theory, this paper argues that visitors act as active agents whose cognitive, personalized, and affective needs can be satisfied through AI-guided services, thereby further shaping museum reputation. Through case analysis of Tengwang Pavilion and Jiangxi Provincial Museum, this study clarifies the internal mechanisms of AI-guided service that affect museum reputation, as well as the matching logic between technological applications and diverse visitor demands. This study integrates Uses and Gratifications Theory and public relationship management and suggests that the museums could adopt reasonable relationship-oriented strategies to enhance public trust and sustain long-term social reputation.

Keywords: AI-guided service; museum reputation; public relationship management; uses and gratifications theory

1. Introduction

In recent years, digital technology has been widely applied across various fields. For museums undergoing digital transformation, adopting AI offers new opportunities to explore diverse scenarios. For instance, the National Museum of China launched an AI employee, Wenwen, in 2022. The application of AI offers new ways to improve visitors' cultural experiences and museums' brand reputation.

Despite the growing academic interest in AI applications in museums, several research gaps remain. Existing studies mainly focus on scenarios such as exhibition design and the digital presentation of artifacts, with relatively limited attention to how guided services mediate between museums and visitors. In addition, most studies adopt a technology-oriented perspective and lack a perspective on visitors' experience to analyze AI-guided service within a public relations framework.

To fill this gap, this study uses Uses and Gratifications Theory as its core. It introduces the perspective of public relationship management to analyze how AI-guided service influences museum reputation. It regards visitors as active users, emphasizing that demand satisfaction serves as a mediating variable between AI-guided service and museum reputation. By analyzing the cases of Tengwang Pavilion and Jiangxi Provincial Museum, this study aims to reveal the internal mechanism of AI-guided service in shaping museum reputation and clarify the matching logic between technological applications and visitor demands, providing theoretical reference and practical suggestions for museums in reputation construction.

Received: 24 July2026; Accepted: 7 August 2026.

Corresponding: Yumeng Yang (stephanieyumengyang@gmail.com)

2. Core Concepts and Theoretical Framework

AI-Guided Service mainly focuses on integrating AI into museum guiding and interpretive services to enable visitors to learn about exhibits in a more instant, immersive, and personalized way than traditional guiding methods. It combines various digital technologies, including Natural Language Processing, voice interaction, and Virtual Reality (VR) and Augmented Reality (AR) [1]. Therefore, AI-guided service can fulfill visitors' diverse needs. For example, it can provide real-time, accurate responses to visitors to help them better understand the exhibitions. It can also recognize visitors' preferences and offer a personalized visiting plan by gathering and analyzing data that records visitors' interests and their visit routes [2]. Moreover, scenarios such as providing immersive interaction, multilingual interpretive services, and optimizing visitors' experience can also be realized with the support of AI-Guided Service [3].

To systematically explore the impact mechanism of this emerging service on museum reputation, this paper adopts a public relations management perspective and draws on Uses and Gratifications Theory. Public relationship management requires two-way communication to balance the interests of both the institution and the public [4]. Therefore, the institution's reputation can be effectively improved, and a supportive social environment can be built. Meanwhile, Uses and Gratifications Theory emphasizes that people make use of media to meet their specific needs [5]. As for the museum, visitors' satisfaction with AI-Guided services plays a mediating role in shaping the relationship between museums and visitors and in enhancing the museum's reputation.

3. Impact Mechanism of AI-Guided Service on Museum Reputation

According to Uses and Gratifications Theory, visitors are active agents rather than passive recipients of AI-guided services when they enjoy museum exhibitions. Therefore, their motivation to adopt AI-Guided services and the degree to which their various demands are satisfied may directly shape their evaluation of museums, and further affect museum reputation in different dimensions. This study categorizes museum reputation into three core dimensions: professional, service, and cultural. This section analyzes how AI-Guided service affects visitors' cognitive and emotional experiences, systematically revealing its impact mechanism on museum reputation.

3.1. Positive Impacts

Firstly, the accuracy and efficiency of AI-guided services in delivering professional information can satisfy visitors' cognitive gratification and thereby affect museums' professional reputation. Cognitive demand, for example, learning about the historical and cultural background of those relics, is the primary motivation for visitors to seek help from a tour guide service in museums. An AI-Guided service based on a large language model can continually search and optimize museum databases to provide visitors with accurate information.[6] Therefore, visitors are willing to ask the AI-tour-guide for either an in-depth interpretation or a supplement to their existing insights. When AI-guided services offer authoritative, accurate, and vivid content to help visitors better understand the relics, not only are visitors' cognitive demands satisfied, but museums' professional image is also shaped in visitors' minds, which can undoubtedly improve the museum's professional reputation.

Secondly, personalized, interactive functions based on AI-Guided service data analysis can meet visitors' personalized needs and enhance museums' service reputation. Visiting preferences vary among individuals based on age, interests, cognitive levels, and so on. Family-based groups may also require specialized support to balance the needs of adults and children during visits [6]. Since AI-Guided service can match different interpretations and styles to visitors' age, preferences, and other factors, visitors may prefer it to enjoy a more delightful trip that better meets their needs when visiting a museum. Such high-quality customized service perception directly enhances the museum's service reputation.

Thirdly, multiple ways of immersive tour-guide services can fulfill visitors' affective gratification and impact museums' cultural reputation. According to Uses and Gratifications Theory, people pursue not only cognitive gains but also emotional and leisure needs when using media. As for museums, visitors may experience a sense of cultural resonance when enjoying the exhibitions. AI technology enables content to be displayed in an immersive way, for example, using VR to display the relics realistically and even allowing

visitors to touch them [3]. Turning rigid cultural knowledge into a vivid sensory experience effectively brings positive emotion to visitors and deepens their cultural identification, which further strengthens the museum's cultural reputation.

3.2. Negative Impacts

While well-matched AI-Guided service enables museums to meet visitors' demands across various dimensions fully, it is undeniable that AI technology's drawbacks may increase risks that lead to visitor disappointment and negatively affect museum credibility. This section analyzes several negative impacts of the imperfect application of AI-Guided service on museum reputation.

Firstly, the "hallucination" problem can directly lead to visitors' cognitive dissonance and damage the credibility of museums as authoritative institutions. Hallucination refers to the phenomenon in which large language models may generate inaccurate or misleading information due to limitations in their training data [7]. When visitors use the tour guide service to obtain accurate professional knowledge, but the AI-Guided service provides them with distorted or incorrect content, it can seriously undermine their trust in the museum's information authority.

Additionally, the lack of emotional interaction leads to an affective gratification deficit, which is related to their sense of cultural resonance, and therefore reduces the museum's service and cultural reputation. Compared with human guides, AI-tour guides lack not only personal experience and an understanding of history and culture, but also the ability to provide emotional feedback that shows empathy for visitors [2,6]. According to Uses and Gratifications Theory, emotional connections are essential demands; the insufficiency of affective gratification reduces visitors' emotional and cultural attachment and further weakens the museum's attractiveness.

Some hidden risks cannot be overlooked. For example, data collected to analyze visitors' preferences may also cause privacy leakage and security issues, and AIGC content used to explain exhibition content may involve intellectual property disputes [3]. These can negatively affect a museum's reputation.

4. Case Analysis of Museum AI-Guided Service Practices

To further verify the correlation between AI-Guided service and museum reputation, this study adopts the analysis of two cultural institutions with a similar cultural background to clarify the mechanism of how AI-Guided service responds to visitors' demands and further promotes the construction of museum reputation, which avoids the cross-cultural and institutional differences to focus on the core research variables. The selected cases are the Tengwang Pavilion and the Jiangxi Provincial Museum, both located in Jiangxi province, and both effectively applying AI technology to their tour guide services. All research data are obtained from official public documents, media reports, and visitors' reviews on social platforms to ensure the objectivity of the case analysis.

4.1. Case 1: Tengwang Pavilion

Tengwang Pavilion launched its AI Wang Bo-guided service in 2025, marking a new achievement in the development of smart cultural tourism. In 2023, they designed an intelligent Pavilion for Reciting the Preface to the Tengwang Pavilion, which is based on the pavilion's history and cultural background and uses AI to check whether visitors can recite the Preface. This makes the visit more engaging for visitors. However, this only served a limited number of visitors and failed to accommodate the large number. To upgrade their service and build an intelligent scenic area, Tengwang Pavilion developed an AI tour guide system in 2024 and then introduced AI Wang Bo in 2025.

AI Wang Bo integrates large language models, multimodal recognition technology, and the exclusive knowledge base of Tengwang Pavilion to build an AI-guided service system covering the entire scenic area, including cultural interpretation based on real-time location or picture recognition, route planning and navigation, and even an original ancient poetry creation function.

The AI Wang Bo application realizes a clear and comprehensive demand-satisfaction mechanism. It can answer professional questions such as "the architectural structure of Tengwang Pavilion" and "the background

of Preface to the Tengwang Pavilion". By accurately answering these questions based on an exclusive knowledge base, Tengwang Pavilion establishes its authority in cultural interpretation, which strengthens public recognition of Tengwang Pavilion as one of the most famous cultural landmarks in Jiangxi Province, thereby enhancing its professional reputation in the field of cultural tourism. Moreover, AI Wang Bo adopts an anthropomorphic interactive mode to stimulate the image of poet Wang Bo to communicate with visitors, which enhances the sense of immersion and interactivity to innovate the form of cultural communication and strengthen its service and cultural reputation. Meanwhile, it still has room for optimization in complex situations, such as multilingual services and barrier-free route guidance.

4.2. Case 2: Jiangxi Provincial Museum

In 2025, Jiangxi Provincial Museum launched AI Huanhuan, an AIGC digital human based on the jade feather relic from a Shang Dynasty Tomb, supported by DeepSeek, a large language model. It is mainly applied in a theme exhibition designed for children, focusing on showcasing the innovative achievements of our ancestors in areas such as astronomical observation and manufacturing. AI technology enables Huanhuan to combine high-definition materials on cultural relics with professional interpretation corpora from the museum, and to translate professional archaeological and technological knowledge into interesting stories that are easy for children to understand. It can also respond to children's imaginative questions in real time, constructing three innovative educational paradigms: shifting from knowledge transmission to cognitive co-construction, from physical exhibition to situational representation, and from single visiting to social learning.

In terms of education, AI Huanhuan not only innovates the museum's public education model, but its vivid, patient interpretation also addresses the pain point of "children being unwilling to visit museums and not understanding cultural relics". As for cultural communication, Huanhuan uses local cultural relics as a model, helping children develop a sense of identity with local culture. Therefore, as an important educational institution and carrier of Jiangxi's cultural heritage, Jiangxi Provincial Museum significantly enhances its brand reputation. However, it is limited to a single themed exhibition area, with room for improvement in comprehensive coverage and depth of content.

Both institutions adopt AI technology to achieve innovative upgrades in cultural communication methods and to transform the guided service mode, effectively breaking the limitations of traditional guided services. There are also some differences between the two institutions. AI Wang Bo serves visitors of all ages and can be applied to a wide range of scenarios. At the same time, AI Huanhuan focuses on children and is deeply integrated into one specific exhibition.

It is undeniable that there are common problems in both cases. They both need to expand their service coverage scenarios to upgrade continually. For example, as a scenic spot that may attract foreign visitors, Tengwang Pavilion may need to expand multilingual services to ensure that foreign visitors can also enjoy their trip, thereby enhancing its international reputation. AI Huanhuan may need to extend to other exhibition areas to enhance its influence. Both of them may pay better attention to the disabled group and offer them barrier-free visiting routes to build a positive brand image.

5. Conclusions

This study systematically demonstrates that AI-Guided service is not only a technological enhancement of museum interpretation, but an innovative mechanism that makes a difference to the relationship between visitors and museums. By integrating Uses and Gratifications Theory with the perspective of public relationship management, this research reveals that the impact of AI-Guided service on museum reputation is mediated by visitors' demand fulfillment, which is related to cognitive, cultural, and affective gratifications. At the same time, technological limitations such as hallucinations and insufficient emotional interaction may also pose challenges to the museum's reputation.

Theoretically, this study connects visitor motivation with museum reputation and extends Uses and Gratifications Theory to AI-based cultural contexts. In practice, it reveals that museum reputation relies on comprehensive demand gratification, advising museums to shift from technology-centered to relationship-

oriented operations while reinforcing risk governance to sustain public trust.

However, this study is still limited in its academic rigor due to the lack of quantitative methods. Future research may employ additional methods, such as surveys and experiments, to test the mechanism, or take other variables, such as cross-cultural differences, into account in AI-Guided service perception.

Funding

This research received no external funding.

Institutional Review Board Statement

Not applicable.

Informed Consent Statement

Not applicable.

Data Availability Statement

Not applicable.

Conflicts of Interest

The author declares no conflict of interest.

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