



The Impact of Website Quality of Museums on Visitors' Willingness to Study in Physical Archaeological Site Museums

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Abstract. The archaeological site museum has important educational significance by showcasing historical relics, artifacts, and related historical backgrounds, allowing visitors to intuitively understand and learn about the past history and culture. The unique geographic spatial characteristics of archaeological site museums affect the willingness of visitors to visit and study in physical museums. By revealing the influencing factors of the official website of the archaeological site museum on the audience's willingness to further visit and study in physical museums, valuable references are provided for the design and production of the official website of the archaeological site museum. Based on the theory of "cognition-affection-conation" and immersion theory, a relationship model between the official website of a site museum and the willingness of visitors to visit a physical museum is constructed from the dual perspectives of visitors' cognitive and emotional images of the museum. Taking Zhoukoudian Site Museum as an example, 272 valid questionnaires were collected through online survey, and SPSS and AMOS were used to verify the rationality of the hypothesis model. The information quality of the museum's official website and the realism created by online virtual venues constructed based on physical exhibition hall have a positive impact on the audience's cognitive image of the museum; The system quality and service quality of the official website have a positive impact on the audience's emotional image of the museum. Furthermore, the audience's cognitive and emotional image of the museum will positively drive their willingness to further experience and study in the physical museum.

Keywords: official website, archaeological site museum, empirical research, "cognition-affection-conation" theory, immersion theory

1 Introduction

An archeological site museum is a museum built on a site to protect excavated sites or to showcase the results of excavations.^[1] The historical relics and sites showcased in site museums often encapsulate rich historical information and profound wisdom, serving as crucial elements in educational endeavors. ^[2] Site museums have fundamental

characteristics such as close integration with archaeology, huge scale, and definite temporal and spatial positioning.^[3] Due to the fact that site museums must follow the unity of spatial content and form over time, most of them are located in remote areas, far from transportation centers, with relatively weak tourism accessibility^[4]. This seriously hinders the audience's willingness to visit museums in person. This can be attributed to three main reasons. First, high transportation costs and poor accessibility result in increased time and financial burdens, compounded by inadequate public transport links. Second, the absence of nearby tourist amenities—such as catering, guided tours, and ancillary services—undermines the overall visitor experience. Third, the remote geographical location widens the psychological expectation gap among tourists, and when combined with monotonous exhibition formats, it exacerbates the decline in visitors' inclination to visit. Given this, the majority of visitors obtain relevant information through the official website of the archaeological site museum. The official website of archaeological site museums strives to provide good information quality, system quality, and service quality to enhance visitors' experience. Most archaeological site museums produce a virtual venue experience section, using panoramic VR technology to provide users with virtual visual experiences and interactive roaming, spreading historical knowledge and cultural connotations of archaeological sites. So, what effects do the experience on the official website and the virtual venue roaming have on visitors' subsequent visits and learning at physical site museums? Will a positive experience on the official website and a realistic virtual enhance visitors' inclination to further explore and experience physical museums?

In existing literature, although factors affecting museum visitors' willingness to visit have been explored from multiple dimensions^[5-10], there are few studies that delve into the perspective of museum official website construction. As a key interface between museums and the public, official websites significantly shape visitors' perceptions through information dissemination. While these digital platforms influence cognitive and emotional engagement, it remains unclear whether virtual experiences translate into physical museum visitation. Moreover, the specific website quality indicators affecting visitation intent require systematic identification. This study addresses two core questions. How does the website quality of archaeological site museums impact onsite visitation willingness? What key website elements drive learning motivation through which mechanisms? By analyzing these aspects, the research aims to establish optimization strategies for museum websites, ultimately enhancing educational outcomes and sustainable development in cultural heritage engagement.

The website quality measurement model is a scientific model used to test various indicators and experience effects of institutional websites. According to different application scenarios, websites can be evaluated from different dimensions. The website quality measurement model constructed by Harold W and Linda A includes two dimensions: service quality and information quality.^[11] Loiacono et al. established the WEBQUALTM website quality measurement model, which includes twelve core indicators, from four dimensions: usefulness, ease of use, entertainment, and complementary relationships.^[12] Delone and Mclean proposed an information system success model from three dimensions: system quality, information quality, and service quality.

^[13] This study adapts this model as a quality measurement model for the official websites of site museums and integrates it with the authenticity measurement model for virtual venues of site museums^[14]. By employing structural equation modeling, the study identifies the relationship model between the quality of site museum official websites and the level of realism in virtual venues, and visitors' willingness to experience and study in physical museums. Furthermore, it uncovers the key indicators through which the former influences the latter. The aim is to provide design and production references for the construction of official websites by site museums.

2 Theoretical Framework Model and Research Hypotheses

2.1 Quality Model of Site Museum Official Website

Delone and Mclean first proposed the successful information system model in 1992 and revised it in 2003^[15]. This article applies the model to the quality evaluation of the official website of the site museum, to assess the impact of the system quality, information quality, and service quality of the site museum's official website on users' cognitive and emotional images of the site museum. The system quality dimension is measured by five variables: applicability, availability, reliability, response time, and availability; The dimension of information quality is measured by five variables: completeness, comprehensibility, personalization, relevance, and security; Service quality is measured by three variables: assurance, empathy, and responsiveness.

Previous studies have found that tourism website information has a positive impact on visitors' perception of tourist destinations.^[16] Researchers in the field of information systems have found that the quality of information system services has a positive impact on users' emotions. When the service quality meets users' expectations, their emotions will be in a positive state.^[17] Scholars have also found through empirical research that the system quality of tourism information systems has a significant positive impact on users' emotional experience.^[18]

Although there is currently no direct research examining the correlation among "cognition-affection-conation" theory and visit intention to archaeological site museums, we tentatively propose the following hypotheses based on the aforementioned research outcomes.

H1: The information quality of the official website of a museum is positively correlated with the audience's perception of the museum's image;

H2: The service quality of the official website of a museum has a positive correlation with the emotional image of the museum by the audience;

H3: The system quality of the official website of a museum has a positive correlation with the audience's emotional image of the museum.

Regarding the evaluation of the cognitive and emotional image of museums, this article draws on the cognitive image and affective image models proposed by Baloglu and Mc Cleary^[19] in the model of destination image formation.

2.2 Immersion Theory

According to the immersion theory, using virtual reality to construct immersive spaces conforms to the laws of human cognitive learning^[20], to immerse the subject in the interactive process of cognition and emotion, thereby enhancing the cognitive image of the learning object. The self-affirmation brought by immersive experience can also stimulate users' subsequent learning behavior^[21]. Therefore, on the official website of the Site Museum, the introduction of a virtual venue experience module provides an immersive experience for the audience, which, along with information quality, becomes a key element in shaping the audience's cognitive image of the Site Museum. These elements have a significant impact on the audience's willingness to further explore physical museums.

According to the immersion theory, we can derive the following assumptions:

H4: The realism of virtual museum venues has a positive correlation with the audience's perception of the museum's image.

With the improvement of the realism of virtual venues, the audience's perception of museums will become more positive and profound. The proposal of this hypothesis aims to explore the potential of virtual reality technology in enhancing the experience and cognition of museum visitors, and provide theoretical support and practical guidance for the construction and optimization of official websites of heritage museums.

2.3 Cognition-Affection-Conation Theory

According to the "cognition-affection-conation" theory^[22] have a very close interaction, and cognition is the basis for emotion and further action. According to Arnold's theory of emotional cognition^[23], as actors, the process of human behavior should be divided into "cognition-evaluation-emotion-need-thinking-action". Museums leverage website content and virtual experiences to build cognitive engagement (exhibits, history, cultural context) and emotional resonance (atmosphere immersion). Enhanced by robust technical infrastructure and user-friendly services, this digital integration cultivates visitor satisfaction and physical visitation intent. Optimizing three core elements—informational clarity, immersive simulations, and platform reliability—proves vital for amplifying cultural outreach and educational impact.

According to this theory, three hypotheses can be derived from the concepts and empirical perspectives of literature: we can obtain the following hypotheses:

H5: There is a positive correlation between the audience's cognitive image of the museum and their willingness to further experience the physical museum; This hypothesis suggests that the information obtained by the audience through the official website of the museum and the cognitive image formed by the virtual venue experience will directly affect their willingness to further visit the physical museum.

H6: There is a positive correlation between the audience's emotional image of the museum and their willingness to further experience the physical museum; This hypothesis emphasizes the importance of emotional imagery in influencing audience willingness to visit. When the audience feels the enthusiastic service, professional attitude, and

good interaction of the museum through the official website, they will form a positive emotional image of the museum.

These two hypotheses jointly reveal the important role of museum official websites in shaping audience cognitive and emotional images, and how these images further influence audience willingness to visit. By optimizing website information and virtual venue experience, improving website system and service quality, museums can actively shape positive perceptions and emotional images of visitors towards the museum, thereby attracting more visitors to visit physical museums.

Based on the above considerations, this study proposes a hypothetical research model for the factors influencing visitors' willingness to visit the official website of the archaeological museum, as shown in Figure 1.

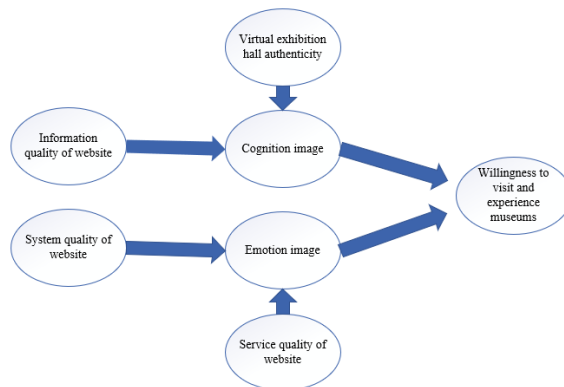


Fig. 1. Model of the Impact of the Official Website of the Site Museum on Visitors' Intention to Visit

3 Questionnaire Scale Design

To ensure the reliability and validity of the measurement tools meet the research standards, this article draws on mature scales that have been validated in existing studies as the research basis. As shown in Table 1, these scales have been widely used and validated, with high reliability and effectiveness. However, considering the specific purpose and characteristics of this study, this article did not fully use the existing scale, but made appropriate modifications and adjustments to the relevant measurement items. This process aims to ensure that the measurement tools can better fit the actual needs of this study, thereby obtaining more accurate and targeted data. In the process of revising the measurement items, we fully considered the characteristics of the research object, the nature of the research question, and the practical feasibility of the questionnaire survey. Through careful design and repeated revisions, the actual measurement items were finally obtained. These questions not only comprehensively reflect the core elements of the research question, but also meet the basic requirements of the questionnaire survey, making them easy for respondents to understand and answer. By conducting a questionnaire survey using these modified measurement items, we were able to collect a large amount of real and effective data. These data provide a solid foundation

for subsequent data analysis and result interpretation, ensuring the accuracy and reliability of the research results.

This study set a total of seven latent variables, among which the three variables of museum website information quality, system quality, and service quality were referenced from the website information quality, service quality, and system quality scales developed and used by Delone and Mclean^[13]; The authenticity of virtual venues in archaeological museums is based on the Slater Usosh Steed scale^[14], which is the most commonly used scale to measure the authenticity of virtual scenes. The audience's perception and emotional image of museums as two variables are measured using the cognitive image and emotional image scales proposed by Baloglu and McCleary in the "cognitive emotional" model of tourist destination image^[19]. The variable of willingness to visit museums is based on the audience's willingness to further experience physical museums scale proposed by Wang Yanfei^[24].

In the design of the survey questionnaire, this study used the Likert 5-point scale method, which is a widely used measurement tool in social science research. By setting five levels of options (1=strongly disagree; 5=strongly agree), respondents are able to express their views and attitudes in more detail when answering questions. This method not only helps to collect richer and deeper data, but also enhances the variability, reliability, and validity of the data, providing a more solid foundation for subsequent statistical analysis.

Table 1. Research Variables and Reference Sources

Latent variable	Scale source
Museum website service quality	Delone & Mclean ^[13]
Quality of Information on Museum Websites	Delone & Mclean ^[13]
Museum website system quality	Delone & Mclean ^[13]
Reality measurement of virtual museum venues	SUS ^[14]
Audience's perception of the museum's image	Baloglu&McCleary ^[19]
Audience's emotional image of museums	Baloglu&McCleary ^[19]
Willingness to visit and experience museums	Wang Yanfei, 2019 ^[24]

4 Distribution, Collection, and Statistics of Questionnaires

4.1 Questionnaire Distribution and Collection

This study focuses on the Zhoukoudian Site Museum and explores in depth the impact mechanism of its official website on visitors' willingness to visit. To ensure the scientific and accurate nature of the research, this study carefully designed a questionnaire and distributed and collected it from November 22, 2023 to December 22, 2023. In the questionnaire distribution process, this study adopted a combination of online and offline methods. On the online front, we have fully utilized the convenience of WeChat as a social media platform, widely spreading the links to Wenjuanxing through our Moments and WeChat groups. At the same time as sending the link, we also provided a detailed explanation of the survey purpose of this study and the precautions to be

taken when filling out the questionnaire, to ensure that the respondents can fully understand and actively participate. We successfully collected 187 questionnaires through online channels. In terms of offline, we have chosen the campus as the main location for distributing questionnaires. Considering the high level of activity and acceptance of new things among college students, we have distributed paid paper questionnaires to them. During the distribution process, we also provided necessary guidance and explanations for filling out the questionnaire to ensure the authenticity and validity of the data. Through offline channels, we ultimately collected 120 questionnaires. Based on the comprehensive online and offline questionnaire collection, this study obtained a total of 307 valid questionnaires. These questionnaire data provide a solid foundation for subsequent statistical analysis and will also provide strong evidence support for revealing the impact mechanism of museum official websites on visitors' willingness to visit.

In this study, a total of 307 questionnaires were collected during the questionnaire collection process. To ensure the accuracy and reliability of the data, we rigorously screened and organized the questionnaires. After careful screening, we eliminated 35 invalid questionnaires and ultimately determined 272 valid questionnaires as the analysis sample for this study. The exclusion of invalid questionnaires is mainly based on the following three situations: firstly, for respondents who have not visited the Zhoukoudian Site Museum website, their questionnaire data cannot reflect the core focus of this study, which is the impact of the website on the audience's willingness to visit, and therefore are judged invalid; Secondly, there are questionnaires with missing items that cannot be effectively statistically analyzed due to incomplete data, therefore they have been removed; Finally, some questionnaires were clearly filled out hastily, with low data quality, and could not provide valuable information for the study, therefore they were also considered invalid questionnaires. After determining the valid questionnaires, this study conducted in-depth statistical analysis on these questionnaires using SPSS 20.0 software. SPSS software, as a widely used statistical analysis tool in social science research, has powerful data processing and analysis capabilities, which can help us reveal the patterns and trends behind the data. Through statistical analysis of valid questionnaires, we are able to more accurately grasp the audience's perception and emotional image of the Zhoukoudian Site Museum website, as well as how these images affect their willingness to visit, thereby providing scientific reference for optimizing the official website construction of the museum.

4.2 Data Statistics and Analysis

(1) Descriptive statistical analysis of samples

This study adopted a dual channel questionnaire collection method, and after digital unified processing, frequency statistical analysis was conducted using SPSS20.0 software. The reason for choosing SPSS lies in its user-friendly interface and proficiency in handling descriptive statistical analysis, correlation analysis, and regression analysis, among others. The results showed that female users accounted for 53.3%, becoming an important component of the sample in this study. In terms of age distribution, the audience aged 26 to 40 has a significant advantage, accounting for 67.3%, indicating that

this age group has a high level of attention to the research topic. It is worth mentioning that all participants in the survey have a college diploma or higher education level, indicating a high level of education. In terms of industry distribution, the data shows a relatively average trend, and no obvious industry bias has been found. In addition, the proportion of non Beijing locals is as high as 83.1%, which reflects the breadth and regional diversity of the research sample. In terms of verifying the validity of the questionnaire, all respondents to the valid questionnaire stated that they had visited the official website of the Zhoukoudian Site Museum, indicating that they have a certain understanding or interest in the museum.

(2) Reliability testing of measurement models

Reliability is an important indicator of the quality of a measurement model, reflecting whether multiple measurement results are consistent, and indicating the stability, reliability, and consistency of the obtained data. Reliability testing generally uses Cronbach's alpha coefficient and overall item correlation coefficient (CITC) to observe the internal consistency of each item in the questionnaire.

This study conducted a detailed statistical analysis of the survey questionnaire using SPSS software, and the data obtained are shown in Table 2. According to the data in Table 2, we can clearly see that the Cronbach's alpha coefficients of seven potential variables, including website system quality, information quality, service quality, virtual exhibition hall authenticity, audience's cognitive and emotional image of the museum, and audience's willingness to further visit and experience the physical museum, are all greater than 0.7, and the overall Cronbach's alpha coefficient value is as high as 0.923. This result fully indicates that the scale selected in this study has a high degree of internal consistency, that is, it has good reliability. In addition, the CITC values of each measured variable are also greater than 0.4, which further verifies the rationality and effectiveness of each measurement item in this study. Therefore, all measurement items are deemed reasonable and need to be retained.

Table 2. Analyze data using SPSS software

Latent variable	Test item	CITC	Factor load (standard factor load)	Cronbach a	AVE value (av- erage var- iance ex- traction)	CR value (combina- tion reliabil- ity)
Website System Quality (SQ)	PS1	0.478	0.766	0.921	0.744	0.842
	PS2	0.596	0.845			
	PS3	0.475	0.768			
	PS4	0.552	0.812			
	PS5	0.616	0.734			
Information Qual- ity (IQ)	PI1	0.712	0.833	0.919	0.816	0.764
	PI2	0.598	0.775			
	PI3	0.596	0.746			
	PI4	0.590	0.842			
	PI5	0.711	0.766			

Service Quality (SEQ)	SEQ1	0.638	0.820	0.92	0.725	0.836
	SEQ2	0.726	0.769			
	SEQ3	0.710	0.813			
Virtual exhibition hall authenticity (VR)	VR1	0.664	0.762	0.922	0.763	0.875
	VR2	0.615	0.758			
	VR3	0.708	0.853			
	VR4	0.575	0.844			
	VR5	0.697	0.854			
	VR6	0.630	0.795			
Museum Cognitive Image (RI)	RI1	0.512	0.803	0.92	0.739	0.795
	RI2	0.515	0.814			
	RI3	0.538	0.821			
Museum Emotional Image (EI)	EI1	0.412	0.769	0.919	0.863	0.782
	EI2	0.532	0.815			
	EI3	0.580	0.824			
	EI4	0.509	0.807			
Audience's willingness to experience visiting physical museums (VI)	VI1	0.501	0.803	0.921	0.769	0.816
	VI2	0.543	0.825			
	VI3	0.548	0.837			

(3) Questionnaire validity analysis

Questionnaire validity, as an important indicator for measuring the accuracy of measurement tools, reflects to what extent the tool can accurately capture and reflect the essential characteristics of the things to be measured. If the fit between the measured results and the predetermined examination content is higher, it means that the validity of the questionnaire is higher, and the reliability and effectiveness of its measurement results are correspondingly enhanced. Validity can be divided into three types: content validity, criterion validity, and construct validity.

Content validity, as an important indicator for measuring whether a measurement tool comprehensively covers all items of the measured concepts, is of great significance in ensuring the accuracy and reliability of research. The commonly used methods for verifying content validity include KMO (Kaiser Meyer Olkin) test and Bartlett sphericity test. These two testing methods can effectively evaluate whether the measurement tool is suitable for factor analysis, thereby further verifying its content validity. In this study, we used SPSS software to perform KMO and Bartlett sphericity tests on the survey questionnaire (Refer to Figure 2 for the data). After analysis and calculation, the KMO value obtained is 0.965, which is higher than the usual standard of 0.9, indicating a high sample adequacy. At the same time, a significance level of 0.000, below the critical value of 0.001, indicates that the sample data has high correlation and is suitable for factor analysis. The significance of these two values fully demonstrates the good content validity of the measurement tool used in this study.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.965
Approx. Chi-Square		2395.250
Bartlett's Test of Sphericity	df	171
	Sig.	0.000

Fig. 2. KMO and Bartlett's Test

Structural validity, also known as construct validity, is an important criterion for evaluating whether a measurement tool can effectively reflect its theoretical structure or conceptual framework. It can be further divided into two categories: convergent validity and discriminant validity, which focus on the consistency of internal indicators of the measurement tool and the discrimination between different indicators, respectively. Convergence validity, also known as convergent validity, mainly measures the degree of aggregation between different indicators under the same concept. By testing the three key indicators of load (factor load), combination reliability (CR), and average variance (AVE), convergence validity can be effectively evaluated. In this study, the standard loadings of all indicators were greater than 0.7 and showed high significance at the 0.001 level, indicating a close correlation between each indicator and its corresponding latent variable. Meanwhile, the average variance extraction (AVE) of each variable is greater than 0.5, and the composite reliability (CR) is greater than 0.7, which further confirms the good convergent validity of the scale. Differentiated validity, also known as discriminant validity, aims to evaluate the degree of differentiation between different concepts or indicators. By comparing the relationship between the square root of the extracted variance of each variable (AVE) and the correlation coefficient, the level of discriminant validity can be determined. As shown in Table 3, the square roots of the AVE variables in this study are all greater than their correlation coefficients with other variables, indicating that the different indicators in the scale can be effectively distinguished and have good discriminant validity.

Table 3. Differential Validity of Measurement Models

Latent variable	SQ	IQ	SEQ	VR	RI	EI	VI
SQ	0.863						
IQ	0.750	0.903					
SEQ	0.738	0.772	0.851				
VR	0.738	0.843	0.816	0.873			
RI	0.755	0.678	0.736	0.821	0.860		
EI	0.852	0.722	0.802	0.856	0.816	0.929	
VI	0.749	0.779	0.695	0.808	0.794	0.835	0.877

(4) Model fitting test

This study employed IBM SPSS AMOS 26 software to conduct a goodness-of-fit test on the conceptual model. AMOS was chosen due to its expertise in handling complex multivariate relationships and its ability to test the fit of theoretical models, making it highly suitable for the objectives of this research. During the testing process, the maximum likelihood method, commonly used in statistics, was adopted to conduct a thorough analysis of the parameters of the sample data. We have compiled the results output by the software into a statistical table as shown in Table 4. According to the data in the table, except for AGFI (adjusted goodness of fit index) slightly lower than the commonly recommended value of 0.9, all other fitting indices are better than or meet the statistical recommendation criteria. This result indicates that the conceptual model constructed in this study has a high degree of goodness of fit with the sample data, and the overall performance of the model is good, which can accurately reflect actual phenomena or problems.

Table 4. Recommended and actual values of model fitting index

Fit index	χ^2/df	GFI	AGFI	NFI	NNFI	CFI	RMSEA
Recommended value	<2	>0.90	>0.80	>0.90	>0.90	>0.90	<0.08
actual value	1.303	0.963	0.897	0.949	0.912	0.982	0.03

Note: χ^2/df is the ratio of chi square value to degrees of freedom, GFI is the goodness of fit index, AGFI is the adjusted goodness of fit index, NFI is the standard fit index, NNFI is the non-standard fit index, CFI is the comparative fit index, and RMSEA is the root mean square of approximation error.

(5) Hypothesis path test

On the basis of confirmatory factor analysis, seven latent variables and their corresponding measurement items were imported into the conceptual model, and path coefficient tests were conducted on the research hypotheses using AMOS26.0's maximum likelihood method to examine whether the research hypotheses proposed by the conceptual model were supported by parameter testing structures. The final test results are shown in Table 5.

Table 5. Model Validation and Hypothesis Testing

Assuming the path	Standardized path coefficient	Standard error	T-value	P value	Significance level	Inspection results
Information Quality ->Cognitive Image	0.448	<0.001	4.293	<0.001	remarkable	establish
Virtual venue realism ->cognitive image	0.336	<0.001	3.368	<0.001	remarkable	establish
System Quality ->Emotional Image	0.358	<0.001	3.874	<0.001	remarkable	establish
Service Quality ->Emotional Image	0.566	<0.001	5.597	<0.001	remarkable	establish

Cognitive image ->willingness to visit physical museums	0.291	<0.001	2.371	<0.001	remarkable	establish
Emotional image ->willingness to visit physical museums	0.389	<0.001	4.017	<0.001	remarkable	establish

Based on the detailed test results in Table 5, this study was able to further validate the proposed hypotheses. Specifically, the study hypothesized that the standardized path coefficient of H1 reached 0.448 ($t=4.293$, $p<0.001$), while the standardized path coefficient of H2 was 0.336 ($t=3.368$, $p<0.001$). Both of these results indicate that the quality of website information and the realism created by virtual venues have a significant positive impact on users' cognitive image of heritage museums, and in comparison, the impact of information quality is more prominent. Similarly, the study hypothesized that the standardized path coefficients for H3 and H4 reached 0.358 ($t=3.874$, $p<0.001$) and 0.566 ($t=5.597$, $p<0.001$), respectively. These two results further reveal that the system quality of the website and the quality of the services provided have a significant positive impact on users' emotional image of the archaeological museum, and among these two, the impact of service quality is more significant. In addition, the study hypothesized that the standardized path coefficients for H5 and H6 were 0.291 ($t=2.371$, $p<0.001$) and 0.389 ($t=4.017$, $p<0.001$), respectively. These two results indicate that users' cognitive and emotional images of archaeological museums have a positive promoting effect on their willingness to further experience and visit physical museums. This discovery provides important theoretical support and practical guidance for us to deepen our understanding and optimize the interactive experience between users and heritage museums.

5 Conclusion and Implications

5.1 Research Conclusion

This study, based on the frameworks of "cognition-affection-conation" theory and immersion theory, deeply explores how the comprehensive quality of museum official websites and the authenticity of online virtual venues affect the willingness of visitors to visit and study in physical museums. The research focuses on the information quality, system quality, and service quality of websites, as well as the realism created by virtual venues, in order to reveal the mechanism by which these factors stimulate audience willingness. The research results indicate that the information quality, system quality, and service quality of museum official websites, as well as the realism of virtual venues, have a significant positive stimulating effect on the willingness of visitors to visit physical museums. This means that while the official website of the museum provides high-quality information, stable and efficient systems, and high-quality services, if advanced virtual technology can be used to create an immersive venue experience for visitors, it will greatly enhance their willingness to visit physical museums. This study not only enriches the application of the "cognition-affection-conation" theory and immersion theory in the field of museum studies, but also provides important theoretical support

and practical guidance for museums on how to use official websites and online virtual venues to enhance audience experience and stimulate visiting and learning willingness. In the future, museums can further optimize the design and functionality of their official websites, enhance the realism and immersion of virtual venues, and attract more visitors to enter physical museums to acquire knowledge of history and culture.

5.2 Practical Implications

This study provides the following practical insights on how to stimulate visitors' willingness to engage with physical museums from the perspective of website development: Firstly, site museums should attach great importance to the quality construction of their official websites. Based on previous research findings, improving the information quality of the website helps enhance visitors' cognitive image of the museum. The information content should be accurate, abundant, and easy to understand, ensuring that visitors can easily obtain the required information and form a positive impression of the museum. Meanwhile, enhancing the system quality and service quality of the website is also crucial. A stable, efficient, and user-friendly system can provide a good browsing experience, while high-quality services can increase visitors' satisfaction and trust, further shaping their positive emotional image of the museum.

Secondly, museums should strengthen digital construction to enhance the realistic experience of virtual exhibition halls. By adopting advanced virtual technology, museums can create immersive exhibition hall experiences for visitors, enhancing their sense of immersion when browsing virtual scenarios. According to the conclusions of this study, the stronger the realism of virtual exhibition halls, the deeper visitors' cognitive image of the museum will be, which in turn stimulates their willingness to further experience the physical museum. Therefore, museums should continuously optimize the design and functionality of virtual exhibition halls, enhancing their realism and interactivity, to attract more visitors to learn about and visit physical museums through online channels.

5.3 Limitations of the Study

This study conducted empirical research based on a questionnaire survey, but there are still five major limitations. Firstly, in terms of the surveyed sample population, this study primarily focused on specific groups such as IT and internet industry workers, technical support personnel, and students from history departments, resulting in a relatively narrow sample scope. Therefore, further validation is needed to determine whether the research conclusions are applicable to other broader user groups. Future studies could consider expanding the survey scope to enhance the robustness of the model's conclusions and attempt grouped comparative analysis of different groups to reveal differences and commonalities among them. Despite these limitations, by segmenting the cognitive patterns of highly engaged groups, this study still provides crucial strategic insights for developing deep audience engagement strategies at archaeological site museums.

Secondly, the sample size in this study is limited, currently falling within the category of small-sample research. To enhance the universal applicability and reliability of the research, future studies should attempt to broaden the scope of the questionnaire survey, increase the sample size, and conduct large-sample surveys to draw more representative conclusions.

Thirdly, in terms of the subject of investigation, this study only conducted empirical analysis on the Zhoukoudian Site Museum, making the research object relatively singular. To more comprehensively explore the impact of the comprehensive quality of museum websites and the realism of virtual exhibition halls on visitors' willingness to experience physical museum visits, future studies could select multiple representative museums for investigation and conduct comparative research to reveal differences and commonalities among different museums.

Fourthly, while sample and temporal constraints limited examination of demographic moderators, theoretical propositions suggest age may amplify website quality's impact on virtual presence (tech affinity), whereas education level could intensify virtual experience effects on visitation intent (content discernment). These hypothesized moderation pathways—testable through moderated regression models—warrant methodological refinements in future research to disentangle audience segmentation dynamics.

Reference

1. ASLAN, Zaki M. The design of protective structures for the conservation and presentation of archaeological sites. University of London, University College London (United Kingdom), 2008.
2. Rivero, Pilar, et al. "Heritage education in the archaeological sites. an identity approach in the museum of Calatayud." *Curator: The Museum Journal* 61.2 (2018): 315-326.
3. Ming Wenxiu Collection and Display of Archaeological Sites Museum [J](in Chinese). *Southeast Culture*, 2014 (02): 111-116
4. Biography of Wang Jing Grand Site Tourism: Collaborative Implementation of Protection and Development [J](in Chinese). *Social Scientist*, 2009 (01): 92-95+99
5. HOOD M. Adult Attitudes Towards Leisure Choices in Relation to Museum Participation[D]The Ohio State University, 1981: 50-57
6. Ntamkarelou L, Bantimaroudis P, Economou M. Testing the Uses and Gratifications Approach to Museum Visiting: Adopting a Mediated Perspective in the Cultural Domain. *Visitor Studies*. 2017;20(1):56-71.
7. NGUYEN, Lan. Factors Influencing Museum Visits: An Empirical Study in Vietnam. *The Journal of Asian Finance, Economics and Business*, 2021, 8.8: 217-227.
8. Candlin F. Rehabilitating unauthorised touch or why museum visitors touch the exhibits. *Senses & Society*. 2017;12(3):251-266.
9. KUMRAKSA, Putsadee; MONPANTHONG, Paithoon. Museum Management Factors Affecting Generation Y Visitors' Decision-Making to Visit Museums. *Pertanika Journal of Social Sciences & Humanities*, 2024, 32.1.
10. OLADEJI, Sunday Oladipo. FACTORS INFLUENCING VISITS AND SATISFACTION: DEVELOPEING STRATEGIES FOR MARKETING MUSEUMS IN OSUN STATE,

- SOUTHWESTERN NIGERIA. *Journal of Archaeology and Tourism-Must*, 2024, 3.1: 13-41.
11. Harold W, Linda A. Site Qual: an integrated measure of Website quality[J]. *The Journal of Enterprise Information Management into customer expectations*, 2004, 17(6): 430-440.
 12. Loiacono E T, Watson R T, Goodhue D L. WebQual: A Measure of Web Site Quality[C], 2002.
 13. DeLone WH, McLean ER. The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems*. 2003, 19(4): 9-30.
 14. USOH, Martin, et al. Using presence questionnaires in reality. *Presence*, 2000, 9.5: 497-503.
 15. DeLone WH, McLean ER. The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems*. 2003, 19(4): 9-30.
 16. DRAMIĆANIN, Sandra; SANČANIN, Branislav. Influence of internet content on tourists decision to visit a cultural tourism destination. *BizInfo Blace*, 2020, 11.2: 1-17.
 17. LIN, Jiun-Sheng Chris; LIANG, Haw-Yi. The influence of service environments on customer emotion and service outcomes. *Managing Service Quality: An International Journal*, 2011, 21.4: 350-372.
 18. SOPALATU, Hapsa; HIDAYATULLAH, S.; RESPATI, Harianto. Tourism website user study: Measuring the impact of system quality and information quality considering user satisfaction to obtain the net benefit. *East African Scholar Journal of Economics, Business and Management*, 2021, 4.1: 24-29.
 19. BALOGLU, S, MCCLEARY, KW. A Model of Destination Image Formation[J]. *Annals of Tourism Research*, 1999(26): 491-500.
 20. SCHELL J. The art of game design: a book of lenses[M]. Boca Raton: CRC Press, 2008.
 21. Mihaly C. Beyond Boredom and Anxiety[M]. San-Francisco: Jossey Bass, 2000: 23.
 22. Hilgard ER. The trilogy of mind: Cognition, affection, and conation[J]. *Journal of the History of the Behavioral Sciences*, 1980, 16(2) : 107-117.
 23. Arnold, M. B. (1960). *Emotion and personality*. New York: Columbia University Press.
 24. Wang Yanfei. Research on the Impact of Innovative Construction of Private Museums in Wuhan on Visitors' Viewing Intentions [D]. (in Chinese). Central China Normal University, 2019.

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