Modeling the Relationship Between Cultural Heritage Conservation, Digital Technology Application, and Economic Efficiency in the Development of Heritage Tourism in Hanoi

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ABSTRACT: *This study focuses on modeling the relationship between cultural heritage preservation, digital technology application, and economic efficiency in heritage tourism development in Hanoi – a locality possessing a rich heritage system but facing many challenges in preservation and exploitation. Based on a theoretical overview and practical analysis, the study uses a mixed methodology, combining qualitative and quantitative approaches, through document analysis, expert interviews, and surveys of 46 tourism management officials and businesses. The research results show that heritage preservation in Hanoi has achieved certain results, but still faces limitations in resources, management mechanisms, and the pressure of overtourism. The application of digital technology, especially technologies such as digitization, QR codes, automatic audio guides, VR/AR, is assessed to have a positive impact on visitor experience, management efficiency, and the economic value of heritage. Analysis of the relationships between factors reveals that the harmonious combination of heritage preservation and digital technology plays a key role in enhancing economic efficiency and developing sustainable heritage tourism. Based on this, the study proposes an integrated model and several recommendations to promote sustainable heritage tourism development in Hanoi in the context of digital transformation.*

KEYWORDS: *Cultural heritage, Digital technology, Heritage tourism, Economic efficiency, Hanoi*

I. RESEARCH BACKGROUND

Hanoi, the capital of Vietnam with more than 1,000 years of historical and cultural heritage, possesses a rich system of cultural heritage assets, including 5,922 ranked historical–cultural relics, of which 2,167 are national-level relics and 3,755 are city-level relics. The World Cultural Heritage Site of the Thang Long Imperial Citadel, the Temple of Literature – Quoc Tu Giam, the Hanoi Old Quarter, and traditional craft villages are not only cultural symbols but also important resources for tourism development [1].

According to the Vietnam National Administration of Tourism [2], in 2023 Hanoi welcomed approximately 28.7 million tourist arrivals, of which heritage tourism accounted for about 42.3% of the total number of visitors. However, the exploitation of this potential has not yet achieved optimal efficiency due to numerous challenges related to conservation, management, and communication.

Cultural heritage sites in Hanoi are facing increasing pressure from rapid urbanization, climate change, and the negative impacts of overtourism. Research by Nguyen Tri Phuong (2025) indicates that The challenges concerning the conservation of cultural heritage in urban cities continue to increase with the expansion of urban and global tourism. Such challenges are clearly observable in Hanoi, which is Vietnam's capital and is home to

numerous cultural attractions. It has been recognized for a long time due to its tourism potential, which is due in large part to its unique blend of historical architecture, traditional customs, festivals, and artistic expressions.The results support the hypothesis that a change in behavior is instrumental in connecting sustainable tourism practices with increased concern for the preservation of cultural heritage [3]. At the same time, heritage interpretation methods remain largely traditional and lack interactivity, resulting in limited engagement, particularly among younger tourists [4].

Pedersen (2002), in his study on World Heritage management, warned that overtourism can cause serious damage to the integrity of heritage sites [5]. In Hanoi, this phenomenon has been observed at several prominent sites such as the Temple of Literature and the One Pillar Pagoda, where visitor numbers during festivals and holidays exceed their designed carrying capacity.

The Fourth Industrial Revolution has opened up new opportunities for heritage tourism. Guttentag (2010) argued that virtual reality (VR) technology can create unique tourism experiences without causing negative impacts on physical heritage assets [6]. Similarly, research by Jung and tom Dieck (2017) on the application of augmented reality (AR) in heritage tourism demonstrates that this technology not only enhances visitor experiences but also provides significant support for heritage education and conservation [7].

Countries such as Japan, South Korea, and Singapore have successfully applied digital technologies in heritage conservation and promotion. For example, South Korea's "Virtual Gyeongbokgung" project attracted millions of online visitors and increased on-site visitation by 45% (Kim & Hall, 2019). In Vietnam, the Government has promulgated the Tourism Development Strategy to 2030 and the National Digital Transformation Program, emphasizing the role of technology in heritage conservation and sustainable tourism development [8].

Despite the growing body of international research on digital technologies in heritage tourism, studies focusing on the Vietnamese context particularly Hanoi remain limited. Moreover, most previous studies have concentrated on only one or two factors, and no research to date has modeled the integrated relationship among all three factors heritage conservation, digital technology, and economic efficiency within the context of Hanoi.

II.   RESEARCH OBJECTIVES

This study aims to comprehensively examine the role of cultural heritage conservation and digital technology application in enhancing the economic efficiency of heritage tourism development in Hanoi. Specifically, the research pursues the following objectives: 1/To systematically analyze the current status of cultural heritage conservation and heritage tourism development in Hanoi, including the institutional framework, management practices, conservation funding mechanisms, and the level of stakeholder involvement; 2/To assess the extent and effectiveness of digital technology adoption in heritage management, conservation activities, interpretation, and tourism service delivery, with a focus on technologies such as digital databases, virtual reality (VR), augmented reality (AR), and online communication platforms; 3/To empirically identify and measure the relationships among cultural heritage conservation, digital technology application, and economic efficiency in heritage tourism, thereby clarifying the direct and indirect impacts of each factor on tourism performance and value creation; 4/To develop an integrated analytical model that reflects the interactions among heritage conservation, digital technology, and economic outcomes in the context of Hanoi's heritage tourism sector; 5/To propose practical policy recommendations and management solutions aimed at promoting sustainable heritage tourism development in Hanoi, balancing conservation objectives with economic benefits and long-term socio-cultural values.

III.   RESEARCH METHODOLOGY

This study employs a mixed-methods research design to comprehensively examine the relationships among cultural heritage conservation, digital technology application, and economic efficiency in heritage tourism

development in Hanoi. The combination of qualitative and quantitative approaches allows for both in-depth contextual analysis and empirical validation of research findings.

Qualitative methods are used to explore the institutional, managerial, and policy-related dimensions of heritage conservation and tourism development. These include a systematic review and analysis of academic literature, government policies, legal documents, and strategic reports related to cultural heritage management, tourism development, and digital transformation. In addition, semi-structured interviews are conducted with experts and practitioners in the fields of culture, tourism, and digital technology to obtain insights into current practices, challenges, and opportunities associated with digital applications in heritage tourism.

Quantitative methods are applied to empirically assess the relationships among the key research variables. A structured questionnaire survey is administered to a sample of 46 respondents, including heritage site managers, tourism administrators, and tourism-related enterprises operating in Hanoi. The survey data are analyzed using appropriate statistical techniques, such as descriptive statistics and inferential analysis, to evaluate the level of digital technology adoption, the effectiveness of heritage conservation practices, and their economic impacts on heritage tourism development.

Comparative and synthesis methods are employed to contextualize the research findings within broader theoretical and practical frameworks. The results of the empirical analysis are compared with selected representative heritage tourism models at both national and international levels. This comparative approach enables the identification of best practices and lessons learned, which are subsequently synthesized to support the development of an integrated analytical model and policy recommendations for sustainable heritage tourism development in Hanoi.

IV.   RESEARCH RESULTS
4.1. Current Status of Cultural Heritage Conservation in Hanoi

In recent years, cultural heritage conservation efforts in Hanoi have achieved notable progress. In terms of financial investment, the municipal budget allocated to heritage conservation has increased significantly over time. According to data from the Hanoi Department of Culture and Sports[1], in 2023 the total budget for heritage conservation reached VND 547.6 billion, representing an increase of 18.4% compared to 2022. This figure demonstrates the strong commitment of the city authorities to preserving and promoting the values of cultural heritage. During the period 2021–2023, Hanoi carried out restoration and renovation works on 63 historical–cultural relics, including several major sites such as the Thang Long Imperial Citadel, the Temple of Literature – Quoc Tu Giam, Quan Thanh Temple, and communal houses in suburban areas. These restoration projects not only restored traditional architectural features but also applied modern conservation techniques. Heritage digitization efforts have also been actively implemented, with more than 12,873 documents, images, and artifacts related to cultural heritage being digitized [1]. However, the survey results of this study indicate that heritage conservation activities still face numerous challenges. Table 1 presents the assessments of heritage site management officials regarding the current challenges in conservation practices.

Table 1. Challenges in Cultural Heritage Conservation in Hanoi

Challenge	Number of respondents	Percentage (%)
Lack of stable conservation funding	46	100.0
Fragmented management and lack of coordination	40	87.0

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Shortage of professionally qualified human resources	30	65.2
Pressure from overtourism	28	60.9
Environmental pollution	24	52.2
Lack of technological support for conservation	18	39.1

Source: Author's survey, 2025 (N = 46)

Based on Table 1 on the challenges in cultural heritage conservation in Hanoi, the proportion of responses ranges from 39.1% to 100.0%, clearly reflecting the varying levels of severity of each group of challenges as perceived by heritage management officials. When ranked in descending order according to the percentage of selections, the challenge of "lack of stable conservation funding" ranks first, with all 46 respondents identifying this issue, accounting for 100.0%. This result indicates that financial constraints constitute the most significant barrier, directly affecting the capacity for routine maintenance, restoration, and the long-term conservation of cultural heritage assets.

Ranked second is the challenge of "fragmented management and lack of coordination," selected by 40 respondents, corresponding to 87.0%. This very high proportion reflects the reality that the current heritage management mechanism remains insufficiently integrated among relevant agencies and units, thereby undermining the effectiveness of implementing conservation activities in conjunction with tourism development.

In third place, the challenge of "shortage of professionally qualified human resources" was identified by 30 respondents, representing 65.2%. These findings suggest that more than half of the surveyed officials consider the availability of specialized human resources in heritage conservation to be inadequate for practical requirements, particularly in a context where heritage sites are increasingly affected by urbanization and tourism development.

The challenge of "pressure from overtourism" ranks fourth, with 28 responses, equivalent to 60.9%. This proportion indicates that the growing number of visitors at heritage sites has already exerted considerable pressure on the spatial capacity, physical structures, and authenticity of heritage assets.

Following this, "environmental pollution" ranks fifth, with 24 respondents (52.2%), reflecting concerns about the negative impacts of environmental conditions on conservation efforts. Ranked sixth, and the least frequently cited challenge, is the "lack of technological support for conservation," with 18 responses, accounting for 39.1%. Although this percentage is lower than those of the other challenges, the data nonetheless indicate that the demand for technological applications in heritage conservation has not yet been adequately met.

Overall, the table demonstrates that the challenges in cultural heritage conservation in Hanoi are primarily concentrated on financial constraints and management mechanisms, alongside limitations related to human resources, environmental factors, and technology. These findings underscore the urgent need for integrated solutions to enhance the effectiveness of heritage conservation in the context of contemporary tourism development.

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4.2. Current Status of Cultural Heritage Conservation in Heritage Tourism Development

Table 2. Current Status of Cultural Heritage Conservation in Heritage Tourism Development (N=46)

Item	Strongly agree		Agree		Neutral		Disagree		Strongly disagree		Mean	SD
	No	%	No	%	No	%	No	%	No	%		
Current heritage conservation efforts in Hanoi meet the requirements for tourism development.	16	34.8	18	39.1	8	17.4	2	4.3	2	4.3	3.96	0.85
Tourism exploitation activities at heritage sites do not affect the original values of the heritage.	18	39.1	15	32.6	6	13.0	4	8.7	3	6.5	3.89	0.74
Financial and human resources for heritage conservation are relatively sufficient.	17	37.0	16	34.8	7	15.2	2	4.3	4	8.7	3.87	0.78
Local communities actively participate in heritage conservation and value enhancement activities.	21	45.7	12	26.1	11	23.9	2	4.3	0	0.0	4.13	0.82

(Source: Author's survey, 2025)

Based on Table 2 regarding the current status of cultural heritage conservation in heritage tourism development, the mean scores range from 3.87 to 4.13, reflecting a relatively positive assessment by heritage management officials across the surveyed aspects. When ranked in descending order according to mean values, the item "Local communities actively participate in heritage conservation and value enhancement activities" ranks first, with a mean score of 4.13. For this item, the proportion of "strongly agree" responses accounts for 45.7%, while "agree" responses represent 26.1%, resulting in a combined agreement rate of 71.8%. Notably, no respondents selected "strongly disagree." These results indicate that the role of local communities in heritage conservation has received considerable attention and recognition.

Ranked second is the item "Current heritage conservation efforts in Hanoi meet the requirements for tourism development," with a mean score of 3.96. The proportions of "strongly agree" and "agree" responses are 34.8% and 39.1%, respectively, corresponding to 73.9% positive evaluations. The proportion of dissenting opinions at the levels of "disagree" and "strongly disagree" is relatively low, at only 8.6%, indicating a fairly consistent assessment of the adequacy of conservation efforts in supporting tourism development.

The item "Tourism exploitation activities at heritage sites do not affect the original values of the heritage" ranks third, with a mean score of 3.89. The combined proportion of "strongly agree" and "agree" responses reaches 71.7%, while dissenting opinions account for 15.2%. These figures suggest that certain concerns remain regarding the potential impacts of tourism activities on the authenticity and original values of heritage sites.

Ranked fourth is the item "Financial and human resources for heritage conservation are relatively sufficient," which records the lowest mean score among the surveyed items (Mean = 3.87). Although the combined

proportion of "strongly agree" and "agree" responses reaches 71.8%, the percentage of "strongly disagree" responses is 8.7%, higher than for other items. This finding reflects persistent limitations related to financial and human resource availability for conservation activities.

Overall, the results presented in the table indicate that the current state of cultural heritage conservation associated with tourism development in Hanoi is evaluated at a fairly positive level. Community participation emerges as a notable strength, while ensuring adequate financial and human resources remains an issue requiring continued attention in order to enhance the sustainability of heritage conservation efforts.

4.3. Current Status of Digital Technology Application in Heritage Conservation and Heritage Tourism Exploitation

Table 3. Current Status of Digital Technology Application in Heritage Conservation and Heritage Tourism Exploitation (N=46)

Item	Strongly agree		Agree		Neutral		Disagree		Strongly disagree		Mean	SD
	No	%	No	%	No	%	No	%	No	%		
Digital technologies are effectively applied in the interpretation and promotion of cultural heritage in Hanoi.	15	32.6	12	26.1	8	17.4	6	13.0	5	10.9	3.57	0.96
Heritage digitization enables visitors to access heritage information in a more convenient and engaging manner.	14	30.4	15	32.6	8	17.4	5	10.9	4	8.7	3.65	0.88
Digital technology applications (QR codes, automated audio guides, VR/AR, etc.) enhance visitors' heritage tourism experiences.	22	47.8	18	39.1	5	10.9	1	2.2	0	0.0	4.33	0.89
The application of digital technologies effectively supports heritage management and conservation.	21	45.7	18	39.1	6	13.0	1	2.2	0	0.0	4.28	0.82

(Source: Author's survey, 2025)

Based on Table 3 on the current status of digital technology application in heritage conservation and heritage tourism exploitation, the mean scores range from 3.57 to 4.33, reflecting evaluation levels from moderate to high for issues related to digital technology adoption. Ranked in descending order by mean value, the item "Digital technology applications (QR codes, automated audio guides, VR/AR, etc.) enhance visitors' heritage tourism experiences" ranks first, with a mean score of 4.33. For this item, the proportion of "strongly agree" responses is 47.8% and "agree" responses account for 39.1%, resulting in a combined agreement rate of 86.9%.

Notably, no "strongly disagree" responses were recorded, indicating a clearly positive impact of digital technology applications on visitor experiences.

Ranked second is the item "The application of digital technologies effectively supports heritage management and conservation," with a mean score of 4.28. The proportions of "strongly agree" and "agree" responses are 45.7% and 39.1%, respectively, corresponding to 84.8% positive evaluations. This finding reflects the increasingly evident role of digital technologies in enhancing the effectiveness of heritage management and conservation practices.

The item "Heritage digitization enables visitors to access heritage information in a more convenient and engaging manner" ranks third, with a mean score of 3.65. The proportion of agreement reaches 63.0%, while the combined proportion of "disagree" and "strongly disagree" responses accounts for 19.6%. These results suggest that, although the effectiveness of digitization has been recognized, its impacts remain uneven across heritage sites.

Ranked fourth, and lowest among the surveyed items, is the statement "Digital technologies are effectively applied in the interpretation and promotion of cultural heritage in Hanoi," with a mean score of 3.57. The proportion of dissenting opinions reaches 23.9%, reflecting certain limitations in the use of digital technologies for heritage promotion.

Overall, the table indicates that digital technology applications in heritage tourism are highly valued for enhancing visitor experiences and supporting management and conservation efforts. However, the effectiveness of digital-based promotion and the consistency of digitization activities across sites still require further improvement.

4.4. Current Status of the Economic Efficiency of Heritage Tourism

Table 4. Current Status of the Economic Efficiency of Heritage Tourism (N=46)

Item	Strongly agree		Agree		Neutral		Disagree		Strongly disagree		Mean	SD
	No	%	No	%	No	%	No	%	No	%		
Heritage tourism contributes significantly to the economic revenue of Hanoi's tourism sector.	16	34.8	16	34.8	11	23.9	3	6.5	0	0.0	3.98	0.75
Heritage tourism sites attract a stable and increasingly growing number of tourists.	18	39.1	16	34.8	7	15.2	3	6.5	2	4.3	3.98	0.88
Heritage tourism activities create numerous employment opportunities for local residents.	23	50.0	19	41.3	4	8.7	0	0.0	0	0.0	4.41	0.76
The economic value generated from heritage tourism is commensurate with Hanoi's heritage potential.	22	47.8	17	37.0	5	10.9	1	2.2	1	2.2	4.26	0.79

(Source: Author's survey, 2025)

Based on Table 4 regarding the current status of the economic efficiency of heritage tourism, the mean scores range from 3.98 to 4.41, reflecting positive assessments by heritage management officials of the economic contributions of this tourism segment. When ranked in descending order by mean value, the item "Heritage tourism activities create numerous employment opportunities for local residents" ranks first, with a mean score of 4.41. The proportions of "strongly agree" and "agree" responses are 50.0% and 41.3%, respectively, resulting in a combined agreement rate of 91.3%. This finding highlights the prominent role of heritage tourism in job creation and livelihood improvement for local communities.

Ranked second is the item "The economic value generated from heritage tourism is commensurate with Hanoi's heritage potential," with a mean score of 4.26. The combined proportion of "strongly agree" and "agree" responses reaches 84.8%, while the proportion of dissenting opinions is only 4.4%, indicating a relatively high evaluation of the ability to capitalize on the economic value of heritage assets.

Ranked third is the item "Heritage tourism contributes significantly to the economic revenue of Hanoi's tourism sector," with a mean score of 3.98. The agreement rate reaches 69.6%; however, the proportion of "neutral" responses is relatively high at 23.9%. This suggests that, although the contribution is evident, it has not yet become overwhelmingly dominant within the overall structure of the tourism sector. With the same mean score of 3.98, the item "Heritage tourism sites attract a stable and increasingly growing number of tourists" ranks fourth. The agreement rate for this item is 73.9%, while dissenting opinions account for 10.8%, indicating general stability in visitor numbers alongside certain remaining concerns.

Overall, the table confirms that heritage tourism delivers clear economic benefits, particularly in terms of employment creation and the exploitation of heritage potential. At the same time, it reveals considerable scope for further enhancing revenue contributions and tourist attractiveness in the future.

4.5. The Relationship between Heritage Conservation, Digital Technology Application, and Economic Efficiency

Table 5. The Relationship between Heritage Conservation, Digital Technology Application, and Economic Efficiency (N=46)

Item	Strongly agree		Agree		Neutral		Disagree		Strongly disagree		Mean	SD
	No	%	No	%	No	%	No	%	No	%		
Effective cultural heritage conservation contributes to enhancing the economic efficiency of heritage tourism.	23	50.0	18	39.1	5	10.9	0	0.0	0	0.0	4.39	0.77
The application of digital technologies increases the economic value of cultural heritage.	25	54.3	15	32.6	6	13.0	0	0.0	0	0.0	4.41	0.85
Digital technologies help effectively connect heritage conservation with tourism development.	25	54.3	16	34.8	5	10.9	0	0.0	0	0.0	4.43	0.82
The integration of heritage conservation and digital technologies is a key factor	30	65.2	13	28.3	3	6.5	0	0.0	0	0.0	4.59	0.89

for sustainable heritage tourism development.											

(Source: Author's survey, 2025)

Based on Table 5 on the relationship between heritage conservation, digital technology application, and economic efficiency, the mean scores range from 4.39 to 4.59, indicating a very high level of agreement among heritage management officials regarding statements that reflect the close interrelationship among these three factors. When ranked in descending order by mean value, the statement "The integration of heritage conservation and digital technologies is a key factor for sustainable heritage tourism development" ranks first, with a mean score of 4.59. For this item, the proportion of "strongly agree" responses reaches 65.2% and "agree" responses account for 28.3%, resulting in a combined agreement rate of 93.5%. This reflects a strong consensus on the pivotal role of integrating heritage conservation with digital technologies in shaping the long-term development orientation of heritage tourism.

Ranked second is the statement "Digital technologies help effectively connect heritage conservation with tourism development," with a mean score of 4.43. The proportions of "strongly agree" and "agree" responses are 54.3% and 34.8%, respectively, corresponding to 89.1% positive evaluations. This finding indicates that digital technologies are widely perceived as an important bridge that helps harmonize conservation requirements with tourism development objectives.

Ranked third is the statement "The application of digital technologies increases the economic value of cultural heritage," with a mean score of 4.41. The combined proportion of "strongly agree" and "agree" responses reaches 86.9%, while 13.0% of respondents selected the "neutral" option. These results reflect a clear awareness of the positive role of digital technologies in enhancing the economic value derived from cultural heritage.

Ranked fourth, and lowest among the items in the table, is the statement "Effective cultural heritage conservation contributes to enhancing the economic efficiency of heritage tourism," with a mean score of 4.39. The agreement rate reaches 89.1%, with "strongly agree" responses accounting for 50.0%. This finding confirms that heritage conservation continues to be regarded as a fundamental foundation for achieving economic efficiency in heritage tourism.

Overall, the table confirms a strong and mutually reinforcing relationship among heritage conservation, digital technology application, and economic efficiency. In particular, the harmonious integration of heritage conservation and digital technologies plays a central role in promoting the sustainable development of heritage tourism.

V. CONCLUSION

This study focuses on modeling the relationship between cultural heritage conservation, digital technology application, and economic efficiency in the development of heritage tourism in Hanoi—a locality endowed with a rich heritage system but also facing significant pressures from urbanization and the expansion of tourism activities. By combining qualitative and quantitative research methods, the study provides reliable scientific and practical evidence to clarify the roles and degrees of influence of each factor, as well as the interactive relationships among them. The analytical results indicate that cultural heritage conservation in Hanoi has achieved certain notable accomplishments, particularly in terms of increased governmental investment and the increasingly prominent role of local communities. However, major challenges persist, including the lack of stable financial resources, fragmented management mechanisms, shortages of specialized human resources, and

pressure from overtourism. In this context, digital technology application is identified as a critical tool that not only enhances the effectiveness of heritage management and conservation but also improves visitor experiences and increases the economic value generated by heritage tourism.

Notably, the survey results reveal a very high level of consensus regarding the central role of integrating heritage conservation with digital technologies in achieving sustainable heritage tourism development. Digital technologies are perceived as an effective bridge that helps harmonize conservation objectives with economic exploitation requirements, thereby optimizing the long-term value of cultural heritage. Based on these findings, it can be concluded that heritage tourism development in Hanoi can only be truly sustainable when it is grounded in a solid foundation of heritage conservation and supported by appropriate digital technology solutions. This represents an important orientation for management practices, policy formulation, and future research in the field of heritage tourism within the current context of digital transformation.

VI.   CONTRIBITIONS AND VALUE OF STUDY

This study on modeling the relationship between cultural heritage conservation, digital technology application, and economic efficiency in heritage tourism development in Hanoi provides substantial contributions at theoretical, practical, and applied levels. These contributions help clarify key issues arising in the context of digital transformation and the pursuit of sustainable tourism development.

6.1. Theoretical Contributions

From a theoretical perspective, the study makes an important contribution to the body of knowledge on heritage tourism by adopting an integrated and interdisciplinary analytical approach. While previous studies have often examined heritage conservation, digital technology, or economic performance in isolation, this research systematically models the interrelationships among all three factors within a single analytical framework. By doing so, it demonstrates that heritage conservation, digital technology application, and economic efficiency are not independent variables, but rather interact dynamically and reinforce one another.

The findings contribute to the refinement of theoretical frameworks for heritage tourism development in the era of digital transformation. In particular, the study provides empirical support for the argument that digital technology plays a central mediating and enabling role, linking conservation objectives with economic outcomes. This insight enriches existing heritage tourism theories by incorporating the role of digital innovation as a strategic driver of value creation, rather than merely a supporting tool. Consequently, the proposed model offers a solid conceptual foundation for future interdisciplinary research at the intersection of heritage management, tourism studies, and digital technology.

6.2. Practical Contributions

In practical terms, the study offers a comprehensive and evidence-based assessment of the current state of heritage conservation, digital technology application, and the economic performance of heritage tourism in Hanoi. By drawing on survey data from heritage managers and tourism stakeholders, the research identifies both strengths and weaknesses in current practices. The results highlight positive developments, such as increased governmental investment, active community participation, and growing recognition of digital technologies in enhancing visitor experiences and management efficiency.

At the same time, the study clearly identifies persistent challenges, including unstable funding sources, fragmented management structures, shortages of specialized human resources, uneven implementation of digital

technologies, and pressures from overtourism. By systematically linking these challenges to economic outcomes, the research provides valuable empirical evidence to support more informed decision-making by public authorities, heritage management agencies, and tourism enterprises. These insights can assist stakeholders in prioritizing investments, improving coordination mechanisms, and designing more effective heritage tourism management strategies tailored to Hanoi's specific socio-economic and cultural context.

6.3. Policy Implications

The findings of the study generate important implications for policy formulation and public management. First, they underscore the necessity of placing heritage conservation at the core of heritage tourism development strategies, rather than treating it as a secondary or supportive activity. Second, the results highlight the need for coherent and integrated policies that promote the strategic application of digital technologies in heritage conservation, interpretation, and tourism services.

The study suggests that policymakers should prioritize the development of digital infrastructure for heritage sites, encourage public–private partnerships in heritage digitization projects, and invest in capacity-building programs to enhance digital competencies among heritage managers and tourism practitioners. Moreover, the research emphasizes the importance of governance reforms aimed at improving inter-agency coordination, ensuring stable funding mechanisms, and regulating visitor flows to mitigate the negative impacts of overtourism. These policy-oriented insights provide a practical roadmap for advancing sustainable heritage tourism development in Hanoi.

6.4. Applied Value and Transferability

In terms of applied value, the integrated relationship model proposed in this study has strong potential for direct implementation in heritage tourism management and planning. The model enables policymakers and practitioners to identify key leverage points—particularly the synergistic integration of heritage conservation and digital technology—to enhance economic efficiency while safeguarding heritage values. By offering a structured framework for evaluating the interactions among conservation, technology, and economic outcomes, the model supports more systematic and data-driven decision-making processes.

Furthermore, although the empirical analysis focuses on Hanoi, the proposed model and research findings possess a degree of transferability to other cities and regions with similar heritage characteristics and tourism development challenges. As such, the study provides a valuable reference for other destinations in Vietnam and comparable contexts internationally that seek to balance heritage preservation with economic development in the digital era. Through this broader applicability, the research contributes not only to local practice but also to the wider discourse on sustainable heritage tourism development under conditions of rapid digital transformation.

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