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A Digital-Data-Based Model for Managing Historical-Cultural Relics in Hanoi: A Contemporary Cultural Governance Approach

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ABSTRACT: Purpose: This article proposes a digital-data-based model for managing historical-cultural relics in Hanoi from the perspective of contemporary cultural governance. Methods: The study employs documentary analysis, policy analysis and conceptual modelling to synthesize legal documents, digital transformation programmes and cultural governance theories. Results: The proposed model consists of five interrelated layers: heritage data foundation, integrated digital platform, data governance and institutions, management operations and public value creation. It emphasizes standardized metadata, risk-based monitoring, controlled openness, community participation and inter-agency coordination. Conclusion: For Hanoi, a city with a dense and heterogeneous heritage system, digital data should not be treated merely as a technical archive. It must become a governance infrastructure that supports evidence-based conservation, transparent prioritization, smart cultural tourism and sustainable public value creation.

1. INTRODUCTION

Hanoi is one of Vietnam's most distinctive heritage cities, where tangible monuments, historical-cultural relics, traditional villages, religious spaces and layers of urban memory coexist within a rapidly changing metropolitan environment. Recent inventory results show that Hanoi has 6,489 historical-cultural relics, following the addition of 567 relics to the citywide inventory list in 2025.[7] This scale makes heritage management not only a cultural task but also an urban governance challenge involving land use, conservation investment, community participation, tourism, education and creative industries.

Traditionally, the management of historical-cultural relics in Vietnam has relied on an administrative-record model. This model focuses on inventory, classification, ranking, conservation approval, restoration permits, inspection and sanctions. Its strength lies in legality and procedural control; however, it is less effective when heritage systems become increasingly complex, spatially dispersed and exposed to pressures from urbanization, commercialization, climate risk and mass tourism. In this context, static paper-based records and fragmented digital files are insufficient for timely decision-making.

The 2024 Law on Cultural Heritage, which takes effect on July 1, 2025, establishes a renewed legal framework for the management, protection and promotion of cultural heritage values in Vietnam.[1] More importantly for this article, the law recognizes the application of advanced science and technology, digitalization and digital transformation as part of the State's policy on cultural heritage. This legal orientation is consistent with the National Programme for Digitalizing Vietnamese Cultural Heritage for the 2021-2030 period, approved by Decision No. 2026/QD-TTg, which calls for a national digital database on cultural heritage and improved digital capacity for heritage professionals.[2]

At the municipal level, Hanoi is accelerating digital transformation toward digital government, digital economy and digital society. The city's Digital Transformation Strategy to 2030, with orientation to 2035, emphasizes sectoral databases, data sharing and digital infrastructure as foundations for governance modernization.[4] In the cultural sector, Hanoi has also expressed the goal of digitizing 100% of historical-cultural relics and using digital technology to enhance conservation, communication and visitor experience.[6] These orientations indicate that digital transformation in heritage management is no longer an optional technical supplement; it has become an institutional requirement.

Against this background, the article addresses three research questions. First, how should digital-data-based relic management in Hanoi be understood from the perspective of contemporary cultural governance? Second, what are the key components of a feasible management model? Third, what governance conditions are required to transform heritage data into public value? The contribution of the article is conceptual and policy-oriented: it proposes a model that can be used as a reference for local heritage databases, digital platforms, inter-agency coordination and future empirical evaluation.

II. METHODS

This article is designed as a conceptual and model-building study. It does not aim to test causal hypotheses through survey data; rather, it synthesizes policy evidence, governance theory and digital heritage principles in order to formulate a management model suitable for Hanoi's historical-cultural relic system.

Three methods are used. The first is documentary analysis. The article reviews legal documents, policy programmes and official information related to cultural heritage, digital transformation and Hanoi's heritage management. Key documents include the 2024 Law on Cultural Heritage, Decision No. 2026/QD-TTg on digitalizing Vietnamese cultural heritage, Decision No. 611/QD-TTg on digital transformation in the cultural sector to 2030 with a vision to 2045, and Hanoi's digital transformation orientations.[1,2,3,4]

The second method is policy analysis based on the logic of objectives, instruments, actors and expected outcomes. This approach helps identify the gap between the goal of digitalizing heritage and the actual governance mechanisms required for data creation, data updating, data sharing, accountability and public use.

The third method is conceptual modelling. The model is developed by combining cultural governance theory, network governance, data governance and digital heritage studies. Cultural governance is understood as the coordination of multiple actors, rules, resources and meanings in the protection and promotion of cultural values.[10,11] Data governance is understood as the institutional arrangement that determines how data are produced, standardized, accessed, protected and used for decision-making. The model is therefore built not only as a technical architecture but also as a governance architecture.

III. RESULTS

3.1. Rationale for a digital-data-based management model

Digital-data-based management of historical-cultural relics can be defined as a governance approach in which data about relics are created, standardized, integrated, updated, analysed and used regularly to support conservation decisions, risk monitoring, restoration planning, visitor management and public communication. In this approach, data are not an auxiliary product of administration; they become the operational infrastructure of heritage governance.

From the viewpoint of contemporary cultural governance, historical-cultural relics should not be seen only as protected objects under state authority. They are also cultural resources co-produced by state agencies, local communities, religious organizations, experts, schools, tourism actors and creative enterprises. The State retains the central role of legal regulation and resource allocation, but the effectiveness of heritage management depends increasingly on coordination, transparency and participation. Digital data can support this transition by making information more visible, comparable and actionable.

Hanoi's heritage system requires a layered data approach. A complete data structure should include not only identification information, address, classification and ranking status, but also spatial boundaries, protection zones, restoration history, structural condition, land-use context, visitor flows, ritual practices, community participation, financial resources, digital media assets and risk indicators. Without such layers, a digital database may become a passive repository rather than an active decision-support system.

Table 1: Main components of the digital-data-based heritage management model

Component	Core content	Governance function
Heritage data foundation	Standardized records on relic identity, legal status, spatial location, historical value, condition, risks and digital media.	Creates a reliable evidence base for inventory, classification, conservation and monitoring.
Integrated digital platform	A shared platform combining database, digital map, multimedia repository, dashboards and public interface.	Connects dispersed data sources and supports inter-agency coordination.
Data governance and institutions	Rules on metadata, data ownership, access rights, updating responsibility, data security and ethical use.	Transforms technical digitalization into accountable governance.
Management operations	Use of data in inspection, restoration planning, permit review, risk alerts, visitor management and community feedback.	Moves management from event-based response to evidence-based prioritization.
Public value creation	Educational access, digital interpretation, cultural tourism, creative reuse and community participation.	Converts heritage data into social, cultural and economic value without weakening conservation principles.

3.2. Structure of the proposed model

The proposed model contains five interrelated layers operating according to the logic of data, platform, institution, action and public value. The first layer is the heritage data foundation. This is the most important layer because the quality of all subsequent decisions depends on the completeness, accuracy, consistency and timeliness of the data. Data should be structured according to common fields, metadata standards and update cycles. Each data field should have an accountable data steward.

The second layer is the integrated digital platform. This platform should not be reduced to a website that introduces relics to visitors. It should function as a management infrastructure that includes a heritage database, geographic information system (GIS) map, digital document repository, multimedia archive, restoration dossier, risk dashboard and controlled public portal. Where possible, the platform should connect with urban planning, land administration, construction, tourism and education databases.

The third layer is data governance and institutions. This layer distinguishes digital transformation from simple digitization. A heritage database becomes valuable only when there are clear rules regarding who creates data, who validates data, who has the right to edit data, which data can be made public, which data must be protected, and how errors are corrected. The principles of findability, accessibility, interoperability and reusability are relevant, but they must be balanced with heritage ethics, sacred values, data security and community rights.[16]

The fourth layer is management operations. Data must be embedded in concrete processes such as inventory, ranking, conservation planning, restoration approval, field inspection, risk monitoring, visitor flow management and communication with local communities. The model therefore requires dashboards and indicators that help managers prioritize relics according to urgency, risk level, legal status, deterioration and social significance.

The fifth layer is public value creation. The ultimate purpose of the model is not to accumulate digital files but to produce public value. Public value includes conservation value, educational value, research value, tourism value, creative value and community value. Digital interpretation, virtual exhibitions, open educational materials and smart tourism routes can help expand public access, provided that authenticity, dignity and the original elements of relics are respected.

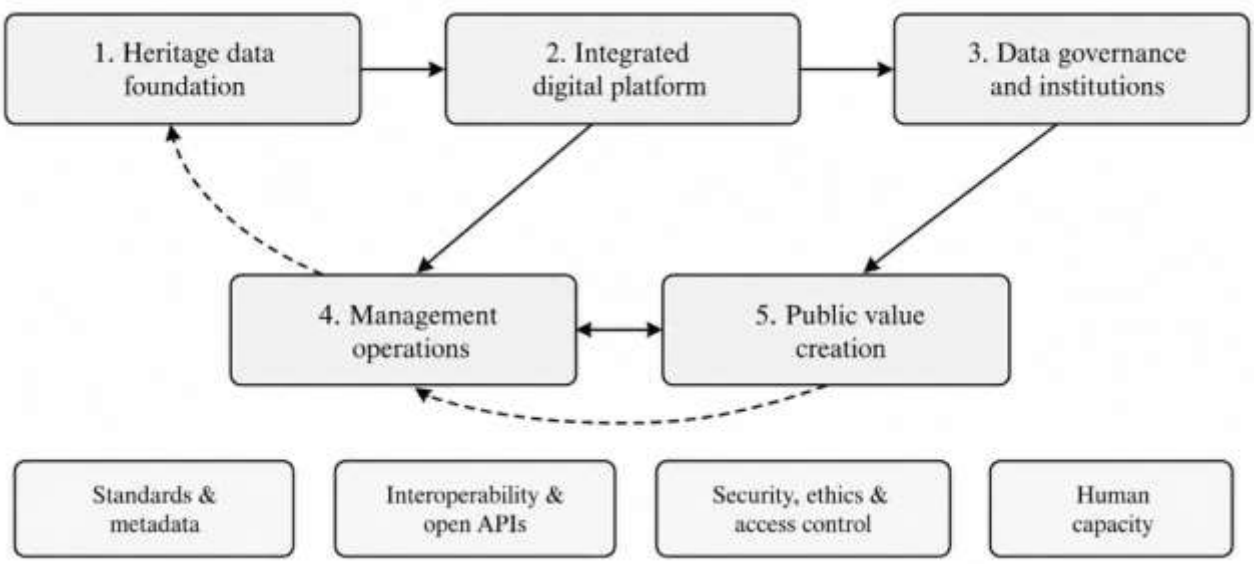

Figure 1: Digital-data-based governance model for historical-cultural relics in Hanoi

3.3. Priority data groups for Hanoi's relic database

For implementation purposes, heritage data should be organized according to managerial use rather than collected as isolated digital materials. Six groups of data should be prioritized. The first group is identification and legal-status data, including the name of the relic, type, address, ownership, ranking status, protection zone and relevant legal documents. This group supports inventory, legal control and administrative reporting.

The second group is spatial and risk data, including coordinates, boundaries, buffer zones, adjacent development projects, environmental threats, fire risk, flooding risk and encroachment indicators. This group is crucial for Hanoi because many relics are located in dense urban, peri-urban or village settings where spatial conflicts are frequent.

The third group is conservation and restoration data, including current condition, damage assessment, restoration history, technical drawings, photographs, materials, expert reports and approved interventions. The fourth group is community and intangible-context data, including festivals, rituals, local narratives, custodians, religious organizations, community groups and patterns of everyday use. The fifth group is visitor, tourism and educational data. The sixth group is financial, project and performance data related to restoration investment, maintenance budgets, sponsorship, socialization and public outcomes.

Table 2: Priority data groups in a digital relic-management database

Data group	Examples of data fields	Main use
Identification and legal status	Name, type, location, ownership, ranking level, protection zone, legal documents.	Inventory, classification, legal control and reporting.
Spatial and risk data	Coordinates, boundaries, land-use context, construction pressure, flooding, fire risk, encroachment.	Risk monitoring, planning coordination and early warning.
Conservation and restoration data	Condition assessment, restoration history, technical drawings, images, materials and expert reports.	Restoration prioritization and technical decision-making.
Community and intangible context	Festivals, rituals, custodians, community groups, local narratives and patterns of use.	Participatory governance and culturally sensitive management.
Visitor, education and tourism data	Visitor flows, interpretation materials, school programmes, digital tours and feedback.	Public access, smart tourism and heritage education.
Finance, projects and performance	Budgets, investment projects, sponsors, timelines, outputs and impact indicators.	Transparency, resource allocation and evaluation.

3.4. Operating mechanism of the model

The model operates through four feedback loops. The first loop is data creation and standardization. Every new item of data should be entered through standardized fields, accompanied by source information, date of entry, responsible unit and validation status. This prevents the database from becoming an unverified collection of files.

The second loop is updating and monitoring. Heritage data cannot be created once and then left unchanged. Updating frequency should be based on risk level. National special relics, relics under restoration, relics in urban development areas and relics with high visitor pressure should be updated more frequently than stable sites. Community reports, field inspection results and remote-sensing or GIS information can be combined to detect changes.

The third loop is analysis and decision support. Once data are standardized, the system can generate dashboards that classify relics by restoration priority, risk level, legal-compliance status, availability of digital documentation, visitor pressure and public-value potential. This enables managers to allocate limited resources more transparently and to justify policy decisions with evidence.

The fourth loop is controlled openness and co-governance. Some heritage data should be open to serve education, research, tourism and creative reuse. Other data, such as information concerning sacred objects, vulnerable structures, security-sensitive locations or privately held materials, require restricted access. Controlled openness makes it possible to promote public engagement without exposing heritage to misuse, commodification or security risks.

3.5. Suggested indicators for model evaluation

A digital-data-based management model should be evaluated not only by the number of digitized records but also by the quality and actual use of data. Table 3 proposes a set of indicators that local managers can adapt for pilot implementation.

Table 3: Suggested indicators for evaluating the proposed model

Dimension	Suggested indicators	Expected governance effect
Data quality	Completeness rate, validation rate, update frequency, metadata consistency.	Improves reliability and comparability of heritage information.
Platform integration	Number of connected databases, GIS coverage, dashboard availability, API readiness.	Reduces fragmentation and supports cross-sector coordination.
Operational use	Share of inspections, restoration plans and risk alerts supported by digital data.	Links data directly to management action.
Participation	Number of community reports, public contributions, school uses and research requests.	Strengthens co-governance and social ownership.
Public value	Digital visits, educational downloads, smart tourism routes, satisfaction feedback and reuse cases.	Shows whether digital heritage creates cultural and social value.
Ethics and security	Access-control compliance, incident reports, privacy safeguards and sensitivity review.	Protects authenticity, dignity and sensitive heritage information.

IV. DISCUSSION

The proposed model is significant because it changes the relationship between data and management authority. In the traditional administrative model, data often serve as an attachment to administrative dossiers. In a digital-data-based governance

model, data become a core infrastructure through which priorities are identified, risks are monitored, resources are allocated and public accountability is strengthened. This shift is consistent with broader ideas of network governance, where public agencies coordinate with multiple actors rather than simply command from above.[11]

For Hanoi, the most important challenge is not the lack of digitalization initiatives but the risk of fragmentation. If each district, monument board, department or project creates its own database without common standards, the result will be a collection of disconnected systems. Such fragmentation may reproduce the weaknesses of paper-based management in a digital form. Therefore, the city needs a shared data architecture, minimum metadata standards, unique identifiers for relics, interoperability protocols and clear assignment of data-stewardship responsibilities.

A second challenge concerns authenticity and the sacred value of relics in digital environments. Digital technologies can expand access, but they may also detach relics from their community context, over-commercialize sacred spaces or simplify complex histories into tourist-oriented narratives. Digital interpretation should therefore be governed by heritage ethics. Public interfaces must distinguish between educational access and entertainment consumption; sensitive materials should be reviewed in consultation with relevant communities and experts.

A third challenge is human capacity. National policy already emphasizes digital transformation training for heritage professionals.[2] However, effective implementation in Hanoi requires more than basic information-technology skills. Heritage managers need capabilities in metadata design, GIS interpretation, digital archiving, data-quality assessment, risk analysis, public communication and privacy protection. Training should be organized in modular form and linked to actual tasks at relic-management units.

A fourth challenge is the financial mechanism. Hanoi has implemented large-scale restoration and conservation programmes, and the city's dense heritage system requires sustained investment.[5,6] Digital transformation should not be treated as a short-term equipment-purchase project. It requires long-term maintenance budgets, software updating, cybersecurity, data cleaning, staff training and evaluation. Public-private partnerships can support interpretation and tourism services, but core heritage data and regulatory functions should remain under public accountability.

The model also has implications for urban governance. Heritage data should be linked with planning, construction, transport, tourism, education and environmental data. For example, when a construction project is proposed near a protected relic, the system should automatically display the relic's protection zone, legal status, conservation condition and risk indicators. Such integration can reduce the gap between cultural management and urban development management.

Finally, the model supports a shift from digitization to digital governance. Digitization means converting analog materials into digital form. Digital governance means using data, institutions and technology to improve collective decision-making. In heritage management, the difference is crucial. A city may have many digital images of relics but still lack a system for updating, validating, sharing and using those images. The proposed model addresses this gap by placing governance rules at the centre of the digital transformation process.

V. CONCLUSION

This article has proposed a digital-data-based model for managing historical-cultural relics in Hanoi from the perspective of contemporary cultural governance. The model consists of five layers: heritage data foundation, integrated digital platform, data governance and institutions, management operations, and public value creation. These layers are connected by feedback loops of data creation, monitoring, analysis and controlled openness.

For Hanoi, where the number and diversity of relics are exceptionally high, the model can support three important transitions. The first is a transition from static record management to dynamic data management. The second is a transition from event-based administrative response to evidence-based risk prioritization. The third is a transition from state-centered management to networked governance that involves communities, experts, schools, tourism actors and creative industries while preserving the regulatory role of the State.

The study is limited by its conceptual design. It has not yet tested the model through survey data, platform log data or pilot implementation in selected districts. Future research should operationalize the proposed indicators, compare heritage-data practices across Hanoi's districts, and develop pilot dashboards for different types of relics. Empirical testing will help refine the model and identify the institutional conditions under which digital data can generate sustainable public value for cultural heritage management.

REFERENCES

1. Cameron, F., & Kenderdine, S. (Eds.). (2007). *Theorizing digital cultural heritage: A critical discourse*. MIT Press.
2. Hanoi Department of Culture and Sports. (2024). *Hanoi: By 2025, 100% of historical-cultural relics will be digitized*.
3. Hanoi Department of Culture and Sports. (2026). *Hanoi promotes heritage in cultural industries*.
4. Hanoi People's Committee. (2026). *Decision No. 521/QD-UBND dated February 3, 2026 approving Hanoi's digital transformation strategy to 2030, with orientation to 2035*.

5. ICOMOS. (1996). *Principles for the recording of monuments, groups of buildings and sites*. International Council on Monuments and Sites.
6. Janssen, M., Charalabidis, Y., & Zuiderwijk, A. (2012). Benefits, adoption barriers and myths of open data and open government. *Information Systems Management, 29*(4), 258–268.
7. Kitchin, R. (2014). *The data revolution: Big data, open data, data infrastructures and their consequences*. SAGE Publications.
8. Kooiman, J. (2003). *Governing as governance*. SAGE Publications.
9. National Assembly of Vietnam. (2024). *Law on Cultural Heritage No. 45/2024/QH15, issued on November 23, 2024, effective from July 1, 2025*.
10. Nhan Dan Newspaper. (2025). *Hanoi discovers 567 more historical sites after inventory*. *Nhan Dan*.
11. Nguyen, T. P. (2025). The impact of sustainable tourism on local community cultural heritage conservation awareness in Hanoi. *Heritage and Sustainable Development, 7*(2), 675. https://doi.org/10.37868/hsd.v7i2.1233
12. Nguyen, T. P. (2026). Digital preservation of Vietnamese cultural heritage: Opportunities and limitations in the age of smart technology. *Preservation, Digital Technology & Culture*. https://doi.org/10.1515/pdtc-2025-0035
13. Parry, R. (2007). *Recoding the museum: Digital heritage and the technologies of change*. Routledge.
14. Phuong, N. T., & Lam, N. T. N. (2025). Evaluating the effectiveness of cultural heritage communication based on local community feedback: A case study of Hanoi City. *Scientific Culture, 11*(3), 1–11. https://doi.org/10.5281/zenodo.17379320
15. Prime Minister of Vietnam. (2021). *Decision No. 2026/QD-TTg dated December 2, 2021 approving the programme for digitalizing Vietnamese cultural heritage for the 2021–2030 period*.
16. Prime Minister of Vietnam. (2026). *Decision No. 611/QD-TTg dated April 4, 2026 approving the project on digital transformation in the cultural sector to 2030, with a vision to 2045*.
17. Rhodes, R. A. W. (1996). The new governance: Governing without government. *Political Studies, 44*(4), 652–667.
18. UNESCO. (2015). *Recommendation concerning the preservation of, and access to, documentary heritage including in digital form*. UNESCO.
19. UNESCO. (2021). *Recommendation on the ethics of artificial intelligence*. UNESCO.
20. Vu, V. T., & Nguyen, T. P. (2026). Heritage memory and identity in Vietnam with a focus on residents' topophilia for sustainable cultural tourism development. *Heritage and Sustainable Development, 8*(1), 55–76. https://doi.org/10.37868/hsd.v8i1.1758
21. Wilkinson, M. D., Dumontier, M., Aalbersberg, I. J., Appleton, G., Axton, M., Baak, A., … Mons, B. (2016). The FAIR guiding principles for scientific data management and stewardship. *Scientific Data, 3*, Article 160018. https://doi.org/10.1038/sdata.2016.18