

Bridging cultural resources and sustainable tourism:

A regional resource database model based on Echizen Washi

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Abstract

Echizen Washi, a handmade paper tradition with over 1,500 years of history, represents a unique synthesis of craftsmanship, spirituality, and community. Rooted in Okamoto-Ōtaki Shrine, a historic shrine dedicated to the goddess of paper, Kawakami Gozen, this tradition continues to thrive as both a sacred practice and a cultural industry. As Japan faces challenges in sustaining traditional crafts and regional cultural resources, the Echizen Washi community demonstrates a forward-looking approach integrating experiential tourism, intergenerational learning, and digital transformation (DX) into heritage continuity. This paper explores how traditional cultural resources can be connected with sustainable cultural tourism through a regional resource database model integrating tacit knowledge, educational activities, digital storytelling, and community participation. The study proposes an interconnected knowledge infrastructure that supports participatory cultural continuity rather than static preservation alone. The findings suggest that DX can function not merely as a tool for digitization, but as a cultural interface connecting cultural identity, creativity, wellbeing, and regional learning ecosystems across generations.

Keywords

Echizen Washi, sustainable tourism, cultural heritage, digital storytelling, regional resource database

1. Introduction

Echizen Washi is more than a regional craft product—it is a cultural ecosystem in which faith, craftsmanship, education, and local identity are deeply interconnected. With a history of more than 1,500 years, the tradition of papermaking in Echizen has been closely associated with Okamoto-Ōtaki Shrine, the sacred site dedicated to Kawakami Gozen, the goddess of paper [Echizen Tourism Association, n.d.]. The spiritual foundations of the craft continue to shape the cultural identity of the region today.

The shrine is also renowned for its architecturally complex main hall, completed in 1843 by master carpenter Kansaburō Ōkubo, who contributed to the imperial gate of Eihei-ji Temple. Featuring layered roof structures combining irimoya and karahafu styles, the building has been described as “the most intricate roof in Japan.” The elaborate carvings beneath the eaves, depicting classical Chinese stories, reflect the syncretic blend of Shinto and Buddhist aesthetics that flourished during the late Edo period.

During the annual autumn festival, local papermakers perform gagaku music as offerings to the deity, symbolically connecting spiritual practice and artisanal craftsmanship. These traditions exemplify what Richards [2011; 2018] and UNESCO [2012] define as creative tourism, in which visitors engage with local culture through participation and shared experience rather than passive observation.

At the same time, the Echizen Washi community continues

to evolve through intergenerational collaboration. At Yanase Washi, younger artisans work together with designers to create contemporary three-dimensional washi artworks while preserving techniques and values inherited from senior craftspeople. This continuity between tradition and innovation illustrates what OECD [2020] describes as cultural resilience supported through digital collaboration and creative adaptation.

Fukui Prefecture possesses rich cultural and historical resources, including traditional crafts, shrine culture, and community-rooted heritage. However, despite these cultural assets, the region faces challenges in transforming local cultural resources into sustainable and globally connected experiential tourism. Regional tourism statistics indicate that tourism attractiveness rankings and the ratio of international visitors remain relatively low compared with the prefecture’s cultural potential.

In particular, many traditional cultural resources remain fragmented across tourism, education, craftsmanship, and local knowledge systems. Furthermore, tacit and embodied craft knowledge accumulated through long-term sensory experience and intergenerational transmission is difficult to preserve and share through conventional digital documentation alone.

Therefore, this study proposes a regional resource database model based on Echizen Washi that integrates cultural resources, tacit craft knowledge, educational activities, and digital storytelling as an interconnected knowledge infrastructure for sustainable tourism and cultural continuity.

2. Background

Research on heritage tourism and creative industries provides the theoretical basis for understanding Echizen Washi’s

transformation. Bramwell and Lane [2011] emphasize the governance of sustainability through participatory collaboration, while dos Anjos and Kennell [2019] argue that effective regional revitalization depends on inclusive governance linking cultural, social, and technological dimensions.

Recent studies also examine how digital tools facilitate cultural resilience and tourism adaptation [OECD, 2020]. In this context, DX is not limited to efficiency gains but expands as a cultural interface—connecting local artisans with global audiences.

Moreover, research in environmental and cultural neuroscience [Jo *et al.*, 2019; Ogoshi *et al.*, 2025] provides evidence that cultural and natural materials, such as handmade paper and organic textures, can promote relaxation and aesthetic pleasure measurable through EEG analysis. This evidence supports emerging wellbeing-oriented tourism models in which cultural products function as both aesthetic and psychological stimuli. These findings suggest that traditional cultural resources such as Echizen Washi may contribute not only to tourism experiences, but also to wellbeing-oriented cultural environments.

By integrating these perspectives, the Echizen Washi community aligns with what UNESCO [2012] defines as creative and participatory heritage and extends it through digital collaboration, multilingual education, and international knowledge sharing.

Traditional craft practices also involve tacit and embodied knowledge accumulated through long-term sensory experience and intergenerational transmission. Such knowledge is often difficult to formalize through conventional documentation, creating challenges for cultural continuity in aging craft communities.

3. Challenges in cultural resource utilization in Fukui

Fukui Prefecture possesses a high concentration of traditional cultural resources, including Echizen Washi, Echizen lacquerware, traditional textiles, and regional food culture. In addition, the prefecture has consistently ranked highly in national well-being and quality-of-life indicators [Fukui Prefecture, 2024].

However, despite these cultural strengths, challenges remain in transforming regional resources into sustainable and globally connected tourism experiences. According to tourism statistics published by Fukui Prefecture [2024], the ratio of international overnight visitors in the prefecture remains significantly lower than the national average. In addition, many tourism activities remain centered on short-term visits rather than immersive and participatory cultural experiences.

Furthermore, cultural resources are often managed separately across tourism, education, local industry, and community activities. As a result, tacit craft knowledge, local narratives, and intergenerational learning opportunities are difficult to preserve and share systematically, particularly within aging craft communities.

These challenges indicate the need for a regional resource database that can function not only as an archive of materials and tourism information, but also as an interconnected knowledge infrastructure linking cultural heritage, experiential learning, digital storytelling, and sustainable tourism.

Figure 1 illustrates the transition of tourism visitors and tourism expenditure in Fukui Prefecture between FY2013 and FY2023. Although tourism activity has gradually recovered following the COVID-19 pandemic, the growth of overnight and internationally connected tourism experiences remains

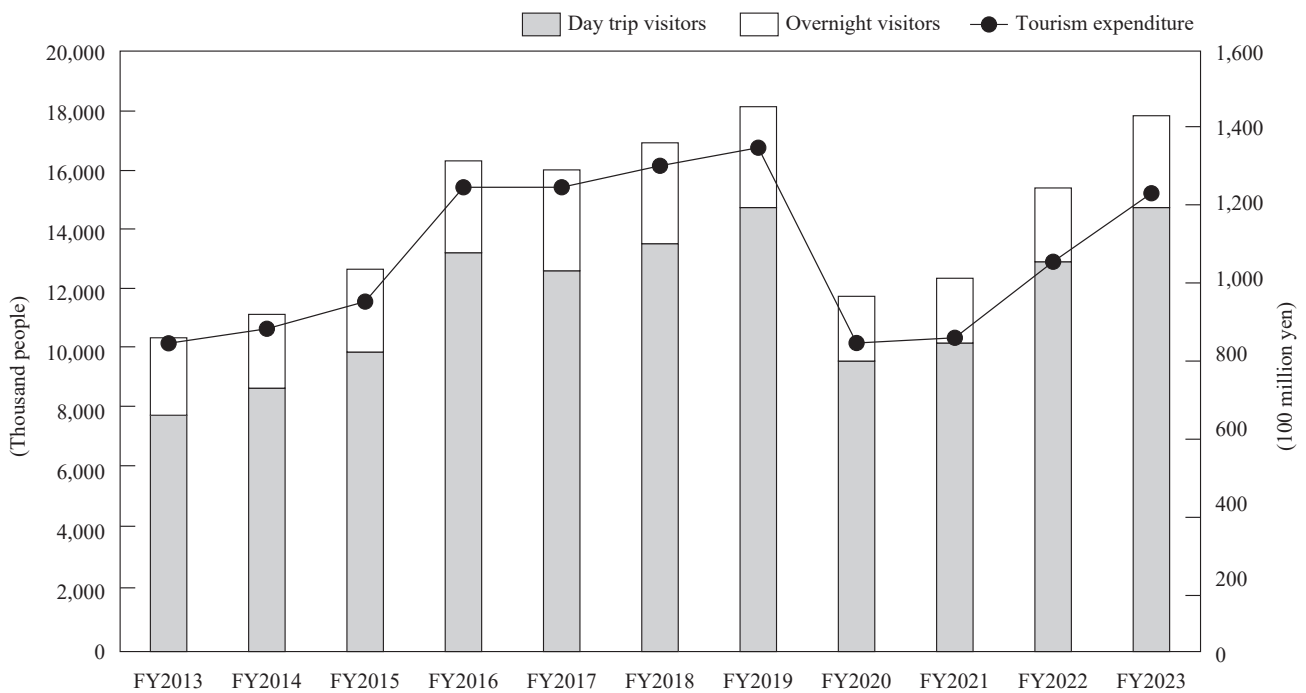


Figure 1: Tourism Statistics in Fukui Prefecture (2013-2023)

Source: Created by author based on Fukui Prefecture (2024).

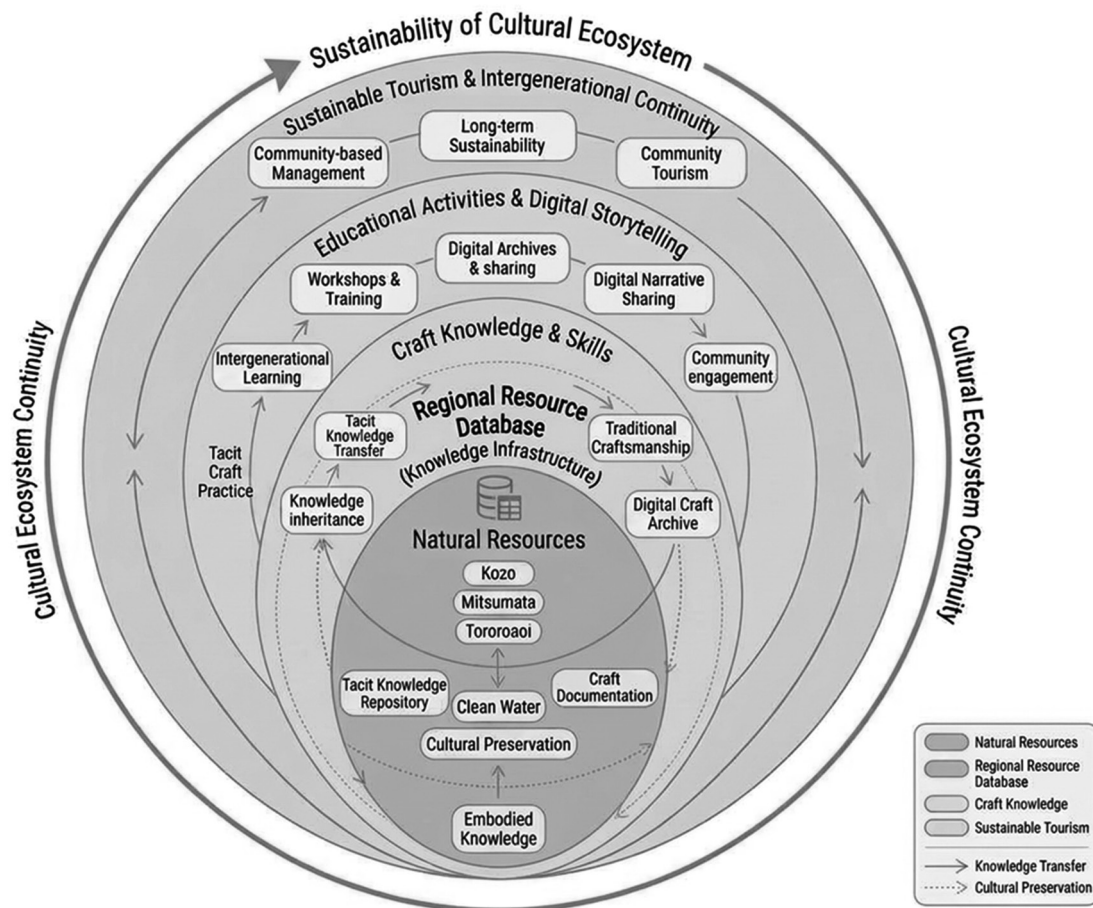


Figure 2: Conceptual structure of the regional resource database model for sustainable cultural tourism

limited relative to the region's cultural resource potential.

Furthermore, Figure 2 highlights the structural gap between Fukui Prefecture's rich cultural assets and tourism-related indicators. Despite possessing nationally significant traditional crafts and high well-being rankings, the prefecture continues to show comparatively low tourism attractiveness rankings and international overnight visitor ratios.

These findings suggest that the central challenge is not the lack of cultural resources themselves, but the absence of integrated systems capable of connecting cultural knowledge, experiential learning, tourism, and intergenerational participation.

4. Echizen Washi as a cultural knowledge ecosystem

Echizen Washi represents not only a traditional craft industry but also a multilayered cultural knowledge ecosystem integrating spirituality, craftsmanship, education, regional identity, and intergenerational learning. The cultural value of Echizen Washi extends beyond the production of handmade paper itself and includes relationships among local communities, natural resources, rituals, artistic practices, and experiential learning.

The origins of Echizen Washi are closely connected to Okamoto-Ōtaki Shrine, dedicated to Kawakami Gozen, the goddess of paper. The shrine has historically functioned as both a spiritual and cultural center for papermaking communi-

ties. During annual festivals, local artisans perform gagaku music as offerings to the deity, symbolically linking craftsmanship, spirituality, and regional identity. These practices illustrate how traditional crafts in Echizen are embedded within broader cultural and social systems rather than existing as isolated industrial activities.

In addition, the architectural and artistic elements surrounding the shrine reflect the historical accumulation of cultural knowledge within the region. The shrine's intricate wooden structures and symbolic carvings preserve historical narratives and aesthetic values that continue to influence local cultural identity. Such elements contribute to what UNESCO [2012] describes as participatory and experience-based cultural heritage.

The production of Echizen Washi also depends on tacit and embodied knowledge accumulated through long-term sensory experience. Papermaking processes require subtle adjustments related to fiber conditions, water quality, viscosity, drying timing, and seasonal environmental changes. These judgments are often difficult to verbalize or standardize, and they are traditionally transmitted through observation, participation, and intergenerational practice within local workshops.

At the same time, younger artisans and designers are introducing new forms of creative expression while preserving traditional techniques and values. For example, contemporary three-dimensional washi artworks and collaborative educa-

tional activities demonstrate how traditional craftsmanship can coexist with digital storytelling, tourism experiences, and creative learning programs. These initiatives represent forms of cultural resilience that adapt traditional knowledge to changing social and technological environments.

Educational activities further reinforce the role of Echizen Washi as a cultural knowledge ecosystem. In Echizen City, elementary school students participate in papermaking experiences, including the production of handmade graduation certificates. Community workshops and STEAM (Science, Technology, Engineering, Arts, and Mathematics)-oriented learning programs also connect traditional crafts with digital technologies, design thinking, and regional environmental resources. Such initiatives support not only cultural preservation but also the development of local identity, creativity, and intergenerational participation.

These interconnected cultural, educational, and experiential elements demonstrate that Echizen Washi functions as more than a craft product or tourism resource. Rather, it operates as a living cultural infrastructure in which tacit knowledge, regional narratives, sensory experiences, and community relationships continuously interact and evolve. This perspective highlights the importance of developing regional resource database systems capable of preserving and connecting both tangible and intangible cultural knowledge for sustainable tourism and cultural continuity.

Therefore, preserving Echizen Washi requires not only documenting visible artifacts, but also sustaining relationships among people, practices, narratives, and sensory experiences.

5. Regional resource database model for sustainable cultural tourism

The findings presented in the previous sections reveal a significant gap between the richness of Fukui Prefecture's cultural resources and their transformation into sustainable and internationally connected tourism value. Although the region possesses a high concentration of traditional cultural assets and has consistently ranked highly in national well-being indicators, tourism-related indicators remain comparatively low. This imbalance suggests that the challenge is not the absence of cultural resources, but rather the lack of integrated systems capable of connecting cultural knowledge, tourism experiences, education, and regional storytelling.

As shown in Figure 1, Fukui Prefecture possesses strong cultural and well-being-related resources, yet the ratio of international overnight visitors remains substantially lower than the national average. In addition, many tourism activities continue to focus on short-term visits rather than immersive and participatory cultural experiences. These findings indicate the need for new approaches capable of connecting cultural assets with sustainable experiential tourism.

Furthermore, traditional cultural resources are often managed separately across tourism, education, local industry, and community activities. As a result, tacit craft knowledge, local narratives, sensory experiences, and intergenerational learning opportunities are difficult to preserve and share systematically. Conventional digital archives primarily focus on storing visible information such as images, maps, and product descriptions, but they are less effective in preserving embodied knowledge accumulated through long-term artisanal practice.

To address these challenges, this study proposes a regional resource database model based on Echizen Washi. The proposed model functions not only as a digital archive but also as an interconnected knowledge infrastructure integrating tangible and intangible cultural heritage, educational activities, experiential tourism, and digital storytelling.

The proposed database model consists of multiple interconnected layers, including:

- cultural assets such as washi workshops, shrines, and traditional architecture;
- natural resources including water environments and tororo-aoi used in papermaking;
- tacit and embodied craft knowledge related to sensory adjustments and artisanal decision-making;
- educational activities such as STEAM-oriented workshops and community learning programs;
- regional narratives, rituals, and intergenerational cultural practices; and
- multilingual digital storytelling for sustainable tourism and international knowledge sharing.

By connecting these layers, the database model supports not only cultural preservation but also experiential tourism, regional education, and cultural continuity. In particular, the integration of tacit knowledge and participatory experiences

Table 1: Gap between cultural resources and tourism value in Fukui Prefecture

Indicator	Status in Japan
Traditional cultural resources	7 crafts
Well-being ranking	1st
Tourism attractiveness	39th
International overnight visitors	2.0 %
National average	19.1 %

Source: Created by author based on Fukui Prefecture (2024).

enables visitors and younger generations to engage with cultural heritage beyond passive observation.

This model demonstrates that cultural DX should not be limited to efficiency-oriented digitalization. Rather, DX can function as a cultural interface that connects local communities, artisans, learners, and global audiences while preserving the relational and sensory dimensions of traditional culture.

Through the case of Echizen Washi, this study suggests that regional resource databases can contribute to sustainable tourism by transforming fragmented cultural resources into interconnected cultural knowledge ecosystems.

6. Conclusion

This paper explored how Echizen Washi sustains its cultural significance through interconnected relationships among craftsmanship, spirituality, education, regional identity, and community participation. Through the case of Echizen Washi, the study examined how traditional cultural resources can be connected with experiential tourism, digital storytelling, and intergenerational learning within a sustainable cultural ecosystem.

The findings suggest that the challenges surrounding traditional cultural heritage are not limited to preservation itself, but also involve the fragmentation of cultural knowledge across tourism, education, local industry, and community activities. In particular, tacit and embodied knowledge accumulated through long-term artisanal practice is difficult to preserve and transmit through conventional documentation-oriented digital archives alone.

To address these challenges, this study proposed a regional resource database model that functions not merely as a repository of tourism information, but as an interconnected knowledge infrastructure integrating cultural resources, tacit knowledge, educational activities, and experiential tourism. The proposed model emphasizes the relationships among natural resources, craft knowledge, cultural practices, digital storytelling, and sustainable tourism within a participatory cultural ecosystem.

Unlike conventional digital archives focused on static preservation, the proposed model supports participatory cultural continuity through tacit knowledge integration, intergenerational learning, and experiential tourism. In this context, DX functions not merely as a tool for digitization, but as a cultural interface that connects people, practices, narratives, and regional identity across generations.

Furthermore, the study suggests that regional resource databases may contribute not only to sustainable tourism development, but also to the long-term continuity of local cultural ecosystems by supporting collaborative learning, cultural participation, and community-based value creation.

Future research should further investigate methods for documenting tacit craft knowledge, multilingual digital storytelling, and the integration of wellbeing-oriented tourism experiences within regional cultural ecosystems. In Fukui Prefecture, on-

going collaborative initiatives involving local communities and regional organizations are also exploring the application of regional resource databases to wellbeing-oriented tourism and personalized cultural experiences. For example, one emerging initiative involves the development of a seasonal herbal tea blending system based on local medicinal plant knowledge and individual wellbeing conditions. These developments suggest the broader applicability of the proposed framework to regional wellbeing ecosystems integrating culture, tourism, and community-based learning.

The proposed regional resource database model demonstrates how digital technologies can support sustainable cultural tourism not by replacing traditional practices, but by connecting cultural knowledge, community participation, and intergenerational learning.

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