

# Strategic Innovation in Cultural Heritage Institutions under Digital Transformation

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## Abstract:

This study investigates how digitalization shapes business model innovation in cultural heritage institutions and its effect on multi-dimensional value creation. Research findings indicate that digitalization could transform the value creation of institutions through platform integration, experience transformation, and ecosystem collaboration. The study further introduces a Dual-Balance model to explain the tensions of institutions during digital transformation. A dynamic balance between these tensions facilitates multi-dimensional value creation and sustainable development. The paper also provides guidance for cultural heritage institutions in developing digital strategies, highlighting the importance of balancing commercial sustainability with public cultural services, while allowing for context-specific transformation paths. Additionally, future research may further validate the usability of the Dual-Balance model and examine the long-term impacts of digital technologies on value creation in the cultural heritage sector.

**Keywords:** Digital transformation; Cultural heritage institutions; Business model innovation; Sustainable development; Dual-Balance model.

## 1. Introduction

### 1.1 Background

As the digital technologies of the online platform, virtual reality, and virtual exhibition continuously evolve, the forms in which cultural heritage is disseminated and displayed have gradually moved beyond the confines of traditional physical spaces [1]. The cultural institutions also have new opportunities for development due to the continuous change. Previous studies suggest that digital technology could

promote business model innovation of cultural institutions through changing the mechanism of value creation and acquisition, thus expanding the audience base, enhancing public interaction, and exploring new revenue streams [2,3].

### 1.2 Research Gap and Objectives

Digital technology provides new opportunities for cultural heritage institutions to develop, yet many of them still face various challenges in practice. While pursuing public cultural missions, institutions also need to explore sustainable operation models. How-

ever, there are still issues that limit the growth of many institutions, such as insufficient funding sources and a small number of consumers. Ensuring long-term operational sustainability also remains a major challenge [4].

The existing studies of digitalisation of cultural heritage primarily focus on the use of technology, user experience, and public involvement of the population. But there are relatively few studies that analyse the sustainable development of institutions from the viewpoint of business model innovation. This is of particular concern because this perspective links technological possibility with organisational sustainability in the long term [2,5]. Sustainable business models research indicates that organisations should create value across economic, social, and environmental dimensions [6]. Multi-dimensional value creation is also necessary in cultural heritage institutions, which by their very nature are left to balance between the economic self-sufficiency and social and educational missions.

Therefore, this paper studies the relationship among digital technology, business model innovation, and the sustainable development of cultural heritage institutions. This study intends to investigate how digitalisation encourages business model innovation and how such innovation aids institutions in attaining collaborative multi-value. The paper, therefore, proposes a Dual-Balance model to further explain the issues that institutions face during digital transformation. This model also provides a framework for analyzing how cultural heritage institutions can develop sustainable digital business models.

## 2. Concept Foundations

### 2.1 Digital Transformation

Digital transformation is the process that organizations go through when they apply digital technologies to change business operations, value creation methods, and organizational structures [2,7]. For cultural heritages, it usually means to enlarge accessibility, preserve collections, and provide services outside physical places through digital tools [1]. Specifically, cultural institutions generally adopt digital technology in digital exhibitions, virtual museums, and online distribution of cultural content.

### 2.2 Business Model Innovation

Business model mainly describes how organisations create, deliver, and capture value [8]. The business model is the fundamental logic that an organization uses to provide value to its customers, attract them to pay for that value, and achieve the acquisition of value [9]. Likewise, during the digital era, business model innovation means changing the way cultural institutions create value, improve the user experience, and gain value [5].

Further studies show that digital business models are not just about technology applications, but also about reallocating resources and creating value for various parties involved in cultural heritage, including institutions, platform providers, and audiences. Russo-Spena et al. went on to state that the digital business model comprises important dimensions such as value orchestration, experience proposition, and value sharing [10]. It can help us understand how a digital business model operates. And it gives a starting point for figuring out how institutions could improve their business model using digital technologies.

### 2.3 Multi-Dimensional Sustainable Value Creation

In the study of sustainable development, the idea of the Triple Bottom Line indicates that organisations should aim for both economic and social as well as environmental gains [11]. This statement emphasizes the importance of balancing different types of values during the growth of organisations.

With the growing pressure from the environmental and society, scholars have been incorporating sustainable development concepts into their studies of business model innovation. According to Bocken et al., the sustainable business model creates economic, social, and environmental values at the same time by changing the way value is created and acquired [6]. Therefore, a sustainable business model is beneficial for analyzing how cultural heritage organisations strike a balance between economic sustainability and their public cultural missions throughout the process of digital transformation.

## 3. Business Model Innovation Pathways Driven by Digital Technologies

### 3.1 Platform Integration

Platform integration is an important approach for cultural heritage institutions to achieve digital transformation. Some institutions still operate traditionally by relying solely on their own venues, collections, and offline visitors, which limits the use of resources and content distribution channels. The audience base of traditional institutions is largely limited by local and relatively demographically homogeneous visitors, thereby restricting their further development.

Comparatively, institutions can centrally exhibit the scattered resources and expand the scope of dissemination by applying the technology and the traffic of digital platforms. Taking Google Arts & Culture as an example, it has integrated digital collections and exhibitions from multiple global museums. Hence, cultural heritage does not depend on single dissemination from individual insti-

tutions, but to enter a cross-institutional shared digital network. Following these, institutions can improve content exposure, reach more international and online users, and thereby address the problem of a narrow structured visitor base [12].

From the view of the business model, platform integration is not only importing contents into the platform, but to change value creation method. Traditional institutions usually independently complete content display, user reach, and service provisions. But digital platforms allow these processes to be accomplished collaboratively by multiple participants. For example, the content is given by institutions, technological tools and channels of dissemination are given by platforms, and the users increase the impact of content by browsing, interacting, and sharing. Hence, value is jointly generated from institutions, platforms, and users instead of a single institution alone. According to Russo-Spena et al., one important characteristic of digital business models is the resource redistribution and value recreation process among many parties via value orchestration and value distribution [10].

Platform integration brings about business model innovation not just by improving dissemination efficiency, but also by enabling cultural institutions to change from individual operations into platform networks. So that institutions can integrate resources, expand their user base, and create value together. And such a novel change of the business model can also lay a groundwork for looking into the chances of sustainable development of cultural relic institutions.

### 3.2 Experience Transformation

The visiting experience of traditional cultural institutions generally focuses on physical exhibitions. However, there are also many people who, due to geographical distance, time arrangement or visiting capacity, want to visit but fail to do so. This means that traditional visits have limited the spread of cultural resources. After digitalisation, institutions begin to improve visitors' experience by applying virtual reality and digital exhibition technology. These technologies allow cultural content to go past physical exhibition places and get seen via websites or mobile devices. Thanks to digitalization, visitors can now take part in cultural activities at various places and times, which makes cultural institutions more appealing and increases the number of people interested in cultural relics [3].

As digitalization happens, the roles of cultural places and people who use them have slowly changed. Traditional museums mainly serve as places to display culture-related content, so people who visit tend to be passive receivers of information. But with digitalisation leading the way, they are focusing more on the visitor experience. Through the interactive design, digital storytelling, and personalised content recommendations, visitor engagement per-

formance is promoted. Thus, visitors have become active participants and even co-creators of online interaction and cultural experience instead of passive recipients [13]. Related studies show that digital technology has gradually changed traditional museums into visitor-oriented cultural service platforms, which makes visitors more engaged and cultural dissemination more effective [4].

The experiential transformation brought about by digital technology has also changed the realisation of cultural values and thus promotes the transformation of business models of cultural institutions. The value of traditional cultural institutions is mainly realised through one-off on-site visits by visitors. With the use of digitalisation, cultural content is continuously accessed and disseminated through various mobile applications and interactive experiences. Hence, the creation of cultural value within institutions will be more dependent on the constant participation and interaction of the visitors, creating opportunities to implement subscription-based revenue models, repeat visitor protocols, and visitor data collection.

### 3.3 Ecosystem Collaboration

Digitalisation has also promoted the multi-player collaborative ecosystem in the cultural heritage. Regarding the digitalization process, cultural heritage protection, distribution, and consumption are becoming more and more the activities of many participants. As an example, cultural institutions, government agencies, technology companies, and the general population all possess unique complementary interests. Using digital technology, different participants can cooperate with each other in data sharing, technological development, and cultural content dissemination, supporting the joint creation of cultural heritage value.

The major sources of cultural content and professional knowledge are the cultural institutions, and the major sources of digital platforms, data processing, and technical support can be found at the technology agency. In the meantime, the government sectors are involved in terms of the policy support and resources coordination. The public then contributes by participating in cultural activities through online engagement, content dissemination, and interactive feedback. These interactions have progressively ensured that the distribution of cultural heritage is not controlled by one institution, as is usually the case.

Relevant research suggests that organisations under digitalisation are increasingly inclined to achieve innovation and value creation by building multi-player value networks. Russo-Spena et al. stated that digital business models rely on value-sharing mechanisms among different participants and thus, achieve value co-creation through resource integration and collaborative interaction [10]. Meanwhile, research from Pesce and Franzè also shows that the development of digital platforms allows cultural

institutions to establish strong connections with various partners, which then forms a cross-institutional collaborative cultural innovation ecosystem [12].

Therefore, ecological collaboration reflects the transformation of the cultural heritage business model from a single organizational operation to a multi-party value co-creation model. This also creates prospects for cultural institutions to seek models of sustainable development.

## 4. Triple Value Coordination Mechanism

Digital business model innovation does not treat economy, society, and environment as competing priorities [14]. Rather, it unites them by redefining the structure of revenue, reach to audiences, and utilisation of resources so that they can support each other in practice [6,11].

### 4.1 Economic Value

Digital business model innovation changes institutions away from a narrow revenue structure. Traditional cultural institutions depend mainly on ticket sales, government grants, and limited cultural merchandise sales. Such a revenue structure relies on a single source of income and is easily affected by location, venue capacity, seasonal fluctuations, and public budget conditions. Comparatively, digitalisation allows institutions to develop multiple revenue streams. Institutions can generate content-based revenue through online membership systems, digital exhibitions, paid courses, and special lectures. E-commerce also provides new revenue streams for cultural merchandise. Cultural institutions, in this way, build up a diversified model of revenue, where offline ticketing, online content subscriptions, digital services, and merchandise sales work simultaneously, making them more financially stable and less reliant on a specific source of funding. Additionally, digital platforms provide institutions with information on users from the reservation system, user profile, and platform data so that they can have a better understanding of user needs, thus improving the service design, conversion rates, and repurchase rates. Hence, economic value is created via a variety of sustainable revenue streams, along with dependable user relationships that digitalisation fosters and sustains over time.

### 4.2 Social Value

Digital business model innovation makes it easier for people to get to know cultural heritage and strengthens the connection between institutions and the public. In person cultural resources acquisition may be limited by place and time. For example, museums that are situated far away or have high entry barriers are hard for visitors to visit even if they are interested. Nonetheless, virtual exhibitions and

short-video introductions contribute to the advantage of accessing and comprehending cultural content by visitors with various needs, as well as diversifying methods of participation.

The model of digital participation with user comments, content sharing, and interaction features alter the educational role of cultural institutions, by helping to make the work of one-dimensional visiting into a prolonged and meaningful relationship. Institutions thereby establish closer relationships with the community and generate long-term visitor communities in the long run [3]. Importantly, social value is not confined to public impact. This may produce actual economic gains with more users and donations to the institution and purchasing of goods and services associated with the institutions as credibility and recognition grow among people.

### 4.3 Environmental Value

Resource efficiency and environmental impacts are as important as cultural dissemination effects on institutions. Traditional cultural exhibitions tend to have high resource consumption, including venue and physical transportation. Electronic screens and online performances should not always be able to replace physical experience; however, in some situations, they can help eliminate the reliance on physical activities that require resources. For example, they can decrease the frequency of temporary exhibitions and reduce the use of paper materials and repetitive activities. Moreover, the digital archiving and access through the internet can be used to extend the usage life of culture content. Hence, digitalisation allows a lighter asset-based operating model that aids in supporting the long-term preservation of cultural heritage.

### 4.4 Triple Value Coordination Mechanism

Digital business model innovation promotes multi-dimensional collaborative process that help optimize economic, social, and environmental value together. Digitalisation enhances public participation and the social image of cultural organizations. This stable user base will therefore introduce other economic advantages that enable the institutions to reinvest in culture preservation and their services to the public, which consequently will enhance social value and reinforce the loop of reinforcement among the three aspects. Simultaneously, the improvement of environmental and resource efficiency by digitalisation allows for sustainable operations. Therefore, the triple value forms a circular relationship in practice, mutually advancing the sustainable development of cultural heritage institutions.



## 5. The Dual-Balance Model

The Dual-Balance model is applied to explain the main contradictions that cultural heritage institutions encounter during digitalization. Maintaining these tensions assists institutions in resolving commercial growth and mission to the public and scaling expansion against operations efficiency, and contribute to the economic, social, and environmental values.

### 5.1 Balance Commercial Development and Public Mission

Compared with normal businesses, cultural institutions have other responsibilities, such as culture preservation, knowledge dissemination, and public education. Nonetheless, government subsidies and grants alone make the institutions prone to financial instability due to the fact that government funding may fluctuate as per the policies, budgets, and other priorities, creating a disruption in the long run. Institutions need to explore appropriate commercialization paths during digitalisation. Nevertheless, over-commercialization might deviate from public service orientation, whereas over-reliance on public welfare might restrict long-term digital investment due to a lack of funds.

The Dual-Balance model suggests that such a conflict could be resolved by a collaborative rather than selective approach. Institutions can design their service structure hierarchically. On the one hand, the institutions may provide free or low-entry digital content to ensure that the public will have basic access to the cultural resources. Conversely, the institutions may introduce paid methods of a more intimate personalised experience, thus increasing income, without taking away their social mandate.

Commercialization, in turn, can offer sources of funding for such a public mission. The proceeds generated by digital platforms might, for instance, be invested back into conserving heritage sites, creating free educational resources, and providing cultural services to the underprivileged in society. At the same time, institutions are able to build trust and recognition through the provision of cultural services, and this attracts people to participate and eventually contribute to economic value.

Therefore, commercialization and public mission are not opposing forces, but can support one another. Business events provide resources for public welfare, while social value offers a foundation for business operations. However, their cooperation does not exist naturally. If institutions over-commercialize, people might have less access to culture. This could harm the institution's public image and the balance between commercial goals and public mission.

### 5.2 Balance Scale Expansion and Operational

### Efficiency

Institutions can use digital platforms, virtual exhibitions, and online services for cross-regional dissemination. However, scale expansion does not always support sustainability. When the facilities of the institution are not corresponding to the expansion, then there is a possibility of scattering of the resources, many more problems with management, and a lack of quality of service. For example, institutions that started many digital projects in a short period of time often struggled to keep those projects going because they lack follow-up technical capabilities, which in turn weakened the user experience.

Large-scale cultural heritage institutions with financial strength, technological capacity, and established brand recognition are well-positioned to develop their own platforms. Through platform integration, these institutions can gather up dispersed resources such as collections, programming, and audience information under one single operational infrastructure, which improves coordination and efficiency. On this basis, the user flow and usage on the platform make it more appealing for other cultural institutions, technology companies, and content creators to join in. They can gradually form a multi-party cooperative ecosystem. Additionally, institutions can gain economies of scale by increasing their scope and lowering marginal operating expenses. But large-scale platforms generally involve complex operation systems, so constant investment in technology and ongoing improvement in management are necessary to keep operations running smoothly. Scale expansion should align with institution's own situation. The content may become homogenised or idle on platforms whose growth may not follow the real demand, or the effectiveness increases may not match the growth. Small and medium-sized institutions often lack resources to independently build platforms. They might undertake risks of over-investing and unsustainable development by simply following what large institutions do. Hence, with insufficient resources, institutions should aim to achieve more efficient and flexible digital transformation. Asset-light strategy, for instance, allows institutions to integrate with established digital platforms or to focus on certain cultural areas to serve niche audiences more effectively.

## 6. Conclusion

### 6.1 Key Findings and Theoretical Contributions

The paper mainly discusses about how digital technologies affect cultural heritage institutions' growth by means of business model innovation. Integration of platforms, transformation of the experience, and collaboration of the ecosystem redefine the way institutions create value, and

digital business model promotes the cooperation between economic, social, and environmental values. The paper also presents a Dual-Balance model, which attempts to explain the issue of central balancing that lies in transformation. Digital technologies, business model innovation, and multi-dimensional value creation are integrated in this paper to provide an explanation of the theory for the digital transformation of cultural heritage institutions.

## 6.2 Implications

Institutions need to consider both revenue growth and cultural accessibility and public role when making digital strategies. Layers of designing services allow institutions to provide basic cultural services and, at the same time, design reasonably paid services. Different institutions should choose appropriate development paths based on their own situations. Large ones can generate scale effect through platform integration, whereas smaller ones can choose an asset-light strategy, focusing on niche areas and improving transformation efficiency.

Moreover, policymakers and cultural administrators need to encourage collaborative frameworks through policy measures. For example, by supporting digital platforms and cross-institutional cooperation, institutions of varying sizes and capabilities could join the digital cultural ecosystem.

## 6.3 Limitations and Future Research

This paper is mainly based on literature reviews and concept analysis, so it has not yet tested the proposed model with empirical data. Thus, the conclusion remains theoretical to a certain extent. Future research could do more in-depth discussions about the digitalization path of various kinds of cultural heritage institutions via case study or comparative analysis, so as to verify the applicability and explanatory strength of the Dual-Balance model. Furthermore, with the continuous development of digital technologies such as artificial intelligence, immersive media, and data analytics, the impact of these technologies on the creation of value in cultural institutions is also constantly evolving, which requires ongoing academic attention and provides an opportunity for longitudinal and cross-institutional research.

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