



## Article

# Innovative Approaches to the Management of Cultural Institutions in the Digital Age

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## Abstract

Digitalization has transformed the management of cultural institutions significantly. Digital tools have extended their potential, enhancing visitors' entertainment accessibility. This means that digital technologies are to contribute to cultural institutions' operational activities and management processes. Therefore, the research aim is to systematize and analyze modern innovative approaches to managing cultural institutions in the digital age, determine their efficiency, and outline the challenges for their implementation. The research was a systematic literature review based on the PRISMA statement. It suggested selecting 215 peer-reviewed articles through the Scopus, Web of Science, and DOAJ databases. To analyze the data, content analysis, thematic coding, and comparative analysis were applied. The findings showed that innovative models used in managing cultural institutions are based on digital technologies. The profound impact of digital technologies on the management of cultural institutions was described. This refers to the increased audience engagement and the facilitation of management processes. Besides, specific challenges of using digital technologies in managing cultural institutions were outlined. They include lack of funding, low digital literacy, resistance to change, and ethical issues. The research will be valuable for the enhancement of scientific discourse as well as the development of practical measures to manage cultural institutions effectively through digital technologies.

**Keywords:** Adaptive Strategies, Creative Industries, Cultural Sustainability, Digital Governance, Institutional Innovation

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## Introduction

Digitalization is a powerful engine that brings innovation across industries. Since innovation is essential for organizational survival, it enhances the efficiency of businesses, education systems, and public services (Vărzaru & Bocean, 2024). Digitalization stimulates economic growth globally since digital tools significantly contribute to intelligent automation of processes and optimization of data management (Niedzielski et al., 2024). Moreover, digitalization supports the procedures of real-time decision-making for governments, healthcare systems, financial services, transportation networks, and research organizations, providing the basis for strategic planning (Zhelev & Kostova, 2024).

The COVID-19 pandemic and the ongoing full-scale war in Ukraine have reshaped the global business landscape and forced private companies and state institutions to adapt rapidly to new conditions. This has led to the transformation of management practices across various sectors. “New normal” required the rapid adoption of digital tools and platforms to improve communication, implement new solutions, and achieve high innovation performance during challenging periods (Holl et al., 2024). Expectedly, organizations were forced to introduce cloud computing, virtual collaboration, e-commerce, data analytics, and artificial intelligence-driven solutions to perform everyday activities (Vărzaru & Bocean, 2024). Moreover, the war has encouraged companies and institutions to innovate quickly using digital technologies for resource allocation, sustainable supply chains, personnel management, communication, and identifying security risks (Khatser & Polusmiak, 2024).

Digitalization has transformed the management of cultural institutions as well. Danilyan, Dzeban, and Kalynovskyi (2022b) stated that these institutions must adapt to unpredictable socio-political dynamics to remain sustainable and relevant in the digital era. According to recent findings, digital tools extended their marketing and communication practices, enhanced visitors’ entertainment, and improved audience interaction (Wang & Meng, 2023). Online exhibitions and virtual tours allowed cultural institutions to increase accessibility, breaking physical time and space limitations and creating inclusive opportunities (Li et al., 2022). Particular works describe the organization of digital archives using digital tools. For example, Huda (2022) stated that digital tools contribute to establishing a dynamic records management system and help overcome emerging challenges, remarkably increasing the volume of data and ensuring data security and privacy.

The emergence of interactive systems enabled the creation, maintenance, and alteration of exhibitions online and on-site (Cesário et al., 2023). Virtual reality (VR)

and augmented reality (AR) applications are used for the exploration of historical sites and artworks, offering alternative ways for cultural institutions like museums or galleries to interact with their visitors (Prokopenko & Sapinski, 2024; Shehade & Stylianou-Lambert, 2020). At the same time, gamification and personalized content based on artificial intelligence (AI) enhance interaction and make cultural management more sophisticated through advanced visitor profiling (Ivanov, 2024). In this context, special attention was focused on implementing deep learning and data analytics in managing cultural institutions (Ferrato et al., 2022). It was found that these tools identify the strengths and weaknesses of the cultural institutions and help understand visitor preferences, optimize marketing strategies, and adjust future exhibitions to audience interests. Some sources stress that using AI-based technologies within cultural management impacts person-to-person interactions, shared values, beliefs, and behaviors of participants in a cultural environment (Murire, 2024). Importantly, concerning the study of Danilyan, Dzeban, Kalynovskyi, and Saltanov (2023), it was admitted that the stability of cultural institutions in the digital era depends not only on technological innovation but also on the value-based foundations of social resilience.

The analysis of innovative approaches to managing cultural institutions is an essential aspect of *culturology*, especially given the profound impact of technologies on the creation, consumption, and representation of cultural content today (Chatterjee, 2024). The rise of digital tools has changed cultural management in the technical, organizational, information, communication, and logistical aspects (Bannikova et al., 2023). As technology advances, cultural managers must implement innovative techniques for curating, showcasing, educating, and disseminating cultural knowledge and heritage to remain relevant in the community that is transforming into digitally minded ways.

Moreover, the changing models of culture consumption – driven by digitalization – have transformed the delivery and engagement with art, culture, and entertainment (Murire, 2024). The modern audience rejects passive consumption and prefers interactive, immersive, and personalized experiences that can be provided only by implementing innovations and digital acculturation among individuals or communities (Dey et al., 2020). Additionally, cultural institutions face several serious challenges today, such as declining visitors, expert involvement, organizational and technical issues, and systemic financial deficits that directly influence their activities and interaction with the audience (Choi & Kim, 2021; Nikolaou, 2024). Considering this, it is worth stating that examining innovative approaches to managing cultural

institutions may contribute to a better understanding of digital transformations and fostering resilience in the cultural landscape.

At the same time, despite many studies discussing digital transformation in various sectors, the works regarding the management of cultural institutions are still evolving. It was noted that the existing investigations often focus on individual technological tools (VR, deep learning, AI, or robotics) (Cesário et al., 2023; Ferrato et al., 2022; Shehade & Stylianou-Lambert, 2020) or case studies of specific institutions (Choi & Kim, 2021). However, there is not enough research to present comprehensive frameworks that examine the management of cultural institutions in a digital context. The research aims to systematize and analyze modern innovative approaches to managing cultural institutions in the digital age, determine their efficiency, and outline the challenges for their implementation.

The research focuses on identifying innovative models of cultural institution management in the digital age, examining the impact of digital technologies on the interaction between cultural institutions, their audiences, and internal management processes, and exploring the main barriers and challenges that arise during the implementation of digital innovations in the cultural sector.

#### *Management theory and management models*

Management theory is often defined as structured knowledge that seeks to understand, explain, and improve organizational management practices (Junker et al., 2022). Originating in disciplines such as economics, psychology, and sociology, management theory addresses the complexities of organizational performance and dynamics. According to Skačkauskienė (2022), this theory focuses on understanding the development of management science, providing ideas on future trends, and identifying key areas and research specializations. In other words, management theory is a statement that discloses an aspect of organizational reality and enables prediction and possibly control of future work-related events (Joullié & Gould, 2023).

Management theory includes several essential components to achieve organizational effectiveness, particularly planning, leading, human resources functions, productivity optimization, decision-making, communication, collaboration, and performance evaluation (Bachynskyi, 2024; Bannikova & Mykhaylyova, 2023). Strategically, management theory refers to innovation and digital transformation (León Gómez & Jiménez López, 2024), fostering intellectual capital and knowledge management (Suparwadi et al., 2024), promotion of sustainability and corporate ethics (Nikolenko et al., 2024). Management theory is interdisciplinary and highly contextual in scientific discourse since its realization depends on industry-specific factors, social

trends, cultural influences, economic conditions, and technological influence (Mabi & Buluma, 2024; Skačkauskienė, 2022).

Various management models are introduced to implement management theory. They differ depending on the organization's objectives, industry sector, internal factors, and external conditions. Some widely recognized models include the classical model, lean management, agile management, and stakeholder-oriented approaches; each of them is designated to maximize efficiency and promote adaptability as well as long-term sustainability (Junker et al., 2022; Piwowar-Sulej et al., 2022). Specific findings describe scalability and contingency models, which are essential in the dynamic ecosystem and may be implemented in a big data environment, considering factors like organizational conditions, technology, and workforce (Mardiani et al., 2023).

### *Cultural management*

The changing political and economic landscape in which the cultural institutions (museums, galleries, theatres, music festivals, and archives) exist has affected their realities and forced them to concentrate their efforts on establishing an effective management system (Wróblewski et al., 2019). Today, cultural management involves the complex interactions between culture, economy, and society; it redirects the practices of these institutions towards sustainability and innovation that can ensure their survival in the market (Mateos-Ronco & Peiró Torralba, 2019).

The core principle of cultural management is to understand the importance of balancing cultural initiatives with organizational and economic goals under the effect of globalization (Danilyan, Arbeláez-Campillo, & Rojas-Bahamón, 2022a). At the same time, cultural management is responsible for transforming cultural institutions into more adaptive and inclusive environments to be more relevant in the current age (Allam & Yulianto, 2019). Under such conditions, there is a need to implement an open cultural management model that is more externally focused and public-oriented (Della Lucia et al., 2024). It means that modern cultural institutions must integrate new management concepts, technologies, and innovative practices to reach and engage a broader and more diverse audience. It was found that open strategy processes contribute to the enhancement of relevance, transparency, and accessibility of cultural institutions significantly, and they maintain the idea of extensive representation of multiple perspectives and backgrounds, including diverse heritage (Adobor, 2021).

Currently, scholars differentiate the cultural (curation and protection of cultural objects, research), social (access to exhibitions and audience engagement), and economic (economic impact on the community) dimensions of the management of

cultural institutions (Bălan, 2023; Pop et al., 2019). Besides, some works discuss strategic and operative approaches to cultural management. The strategic approach includes sustainability, participatory culture, and activism. However, the operative approach refers to using new technologies (Bălan, 2023).

### *Change management*

Some literature sources are devoted to explaining change management in the cultural sector. According to Moon (2020), change management is overcoming internal and environmental changes that threaten the resources on which a system depends. Traditionally, the role of cultural institutions was to preserve and study the cultural heritage and function as tourist destinations (Saienko et al., 2020). At present, museums, libraries, and galleries have transformed into a means of communication for visitors. They contribute to improving their communities' social life and economic growth (Szabó & Fosztó, 2020).

Additionally, digitalization has been revealed as a significant change in the management of cultural institutions and the formation of a new paradigm of the relationship between these institutions and their users (Choi & Kim, 2021). This requires balancing changes, preserving the past (Polyezhayev et al., 2024), and forming historical thinking among the targeted audience (Pandan, 2024). Efficient change management ensures modernization efforts, achieves results-based operations, and fulfills public expectations (Nikolaou, 2024). Successful cultural institutions remain relevant, inclusive, and financially sustainable in the dynamic cultural landscape.

It is necessary to outline the main change models that can be adapted to the requirements of the cultural institutions in the digital age. Firstly, the literature discusses implementing business models for museums and galleries based on digital opportunities (Güner & Erim Gülaç, 2022). This model can also be called hybrid because it blends physical and digital access. Regarding this model, traditional activities of cultural institutions change into virtual tours, digital exhibitions, conferences organized through online platforms, etc. Secondly, the social marketing model has been presented. Gonsales (2021) states that the social marketing model strengthens the relevance of cultural activities and makes cultural institutions accessible and sustainable organizations that govern culture and cultural heritage.

### *Innovation theory*

Considering the peculiarities of the management of cultural institutions under the impact of digitalization, innovation theory must be described in detail. Innovation is a cross-disciplinary category that includes product or service, process, marketing,

and organizational innovation (Lin et al., 2024). Additionally, innovation is found to be a distinguishing feature of an efficient management system (Szmitka, 2019). Innovation theory contributes to the performance of an institution, the creation of knowledge within its structure, the promotion of research and development initiatives, and technological advancement (Suparwadi et al., 2024).

The analysis of scientific literature demonstrated that innovation theory is shaped by diffusion of innovation and open innovation, which rely on the gradual acceptance of innovative practices (Bigliardi et al., 2021). Diffusion of innovation helps understand the influence of innovation on changes within cultural institutions. In contrast, open innovation suggests the engagement of cultural institutions with the external environment to create and implement efficient changes. From a scientific point of view, innovation theory focuses on challenges, mainly digital transformation. Scholars analyze the application of innovative digital technologies (Huda, 2022; Wang & Meng, 2023) and data-driven decision-making in cultural institutions (Ferrato et al., 2022).

Besides, innovation theory is concerned with ethics. Despite the extensive use of digital tools in the management of cultural institutions, it is evident that there is an increasing need for ethical behavior from all the participants of the cultural sector. McCausland (2023) admitted that "the most powerful and useful innovations are those that align with ethics and values." In the context of innovation, ethical management prioritizes ethical principles in using digital technologies and innovative tools (Lin et al., 2024). By doing this, cultural institutions can enhance visitor engagement, personalize visitor experiences, and automate the processes intelligently through AI, deep learning, or machine learning.

## **Methodology**

In this research, a search of peer-reviewed articles on innovative approaches to cultural institutions was carried out. These articles were published between January 2015 and January 2025 and included in the Scopus, Web of Science of DOAJ databases. We searched for articles containing the following keywords in the title or abstract: "cultural management," "management of cultural institutions/museum/galleries/exhibitions," "innovative approaches in management," and "digital technologies/tools/instruments in management." The research involved in the article is theoretical, empirical, or review articles. Firstly, 1567 articles were identified. Then, the screening was conducted according to specific criteria. We selected the peer-reviewed articles published in English. Editorials, book reviews, and

opinion articles (64 articles) were excluded since they do not present original research but reflect the author’s perspective on a specific topic.

Further, the abstracts and keywords were analyzed, and the research concerning business corporations or industries' management was excluded. Since the topic of the research deals with cultural institutions, the articles in which the authors reveal the outcomes of cultural management were included. As a result, 467 articles were selected. They analyzed the problems of management of cultural institutions in crises like COVID-19 or war (28 articles), the peculiarities of human resources management and formation of professional competencies among the workforce (17 articles), and the challenges of cultural management (42 articles). Most articles described the impact of technology on cultural management (363 articles). Here, the authors studied using different digital tools like AI, AR, VR, machine learning, and online platforms to manage cultural institutions. Authors paid special attention to digital transformations and the future of cultural institutions. Seventeen articles presented research on the training of future leaders in cultural management. Finally, all articles were analyzed, and 215 works were selected for the review since they met all the criteria — Table 1 overviews research design items.

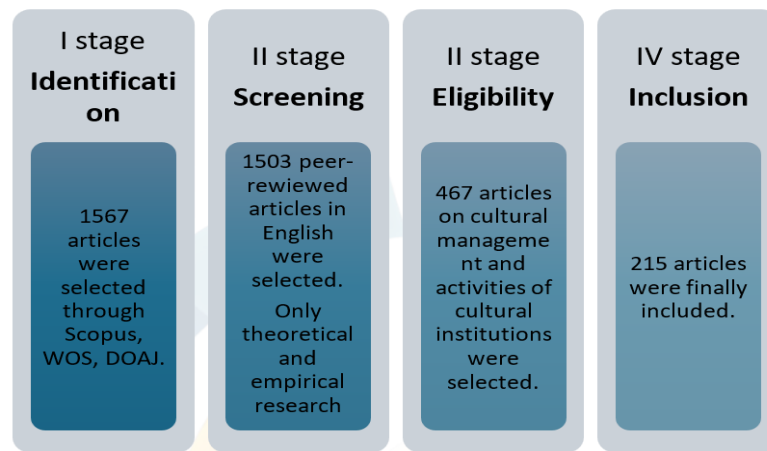
*Table 1. Overview of Research Design Items*

<b>Item</b>	<b>Content</b>
1. Database	Scopus, Web of Science, DOAJ
2. Publication years	January 2015-January 2025
3. Keywords	“Cultural management,” “management of cultural institutions/museum/galleries/exhibitions,” “innovative approaches in management,” “digital technologies/tools/instruments in management”
4. Document type	Article
5. Peer-review	Yes
6. Language	English
7. Content analysed	Abstract, full text, and cited references
8. Extraction date	13.01.2025
9. Total number of articles	1567
10. Number of included articles	215

A systematic literature review was conducted according to the PRISMA 2020 statement (Sohrabi et al., 2021; Page et al., 2021). The review identified and selected research studies related to the specific research question on the principles of objectivity, transparency, heterogeneity, quality assessment, and clarity. Figure 1 provides a diagram that analyzes the four stages of the systematic literature review

according to the PRISMA statement: identification, screening, eligibility, and inclusion.

Figure 1. Implementation of the PRISMA Statement in Research



The extracted data was analyzed using content analysis, thematic coding, and comparative analysis. These methods allowed us to analyze the data systematically and present the findings from various studies, uncovering main themes and differences in the field. Content analysis enabled the identification of principal patterns and trends related to innovative models and challenges of digital innovations. This method helped to categorize the key elements from scientific literature and quantify the frequency of using keywords. Thematic coding is a qualitative method to identify recurring themes within the literature sources. It also encouraged analysis and synthesis of the discussed topics, theories, or findings. Based on thematic coding, the impact of digital technologies on the interaction between cultural institutions and audiences and management processes was outlined. At the same time, comparative analysis was introduced to compare the findings from different studies. The method involved understanding context and identifying similarities and differences. It contributed to the analysis of innovative models of the management of cultural institutions and the peculiarities of the implementation of digital innovations in the field of culture. Special attention was drawn to the main barriers and challenges in the process. Table 2 shows the research questions and data analysis.

Table 2. Research Questions and Data Analysis

Research question	Aspects to be studied	Method
1. What innovative models of the management of cultural institutions are implemented in the digital age?	Management of cultural institutions Digital innovations Digital transformation Innovative models	Content analysis Comparative analysis
2. What digital technologies impact the interaction between cultural institutions, audiences, and management processes?	Digital technologies Impact on interaction between cultural institutions and audience Impact on the management processes Technological integration in cultural institutions	Thematic coding
3. What main barriers and challenges appear while digital innovations are being implemented in the field of culture?	Barriers to digital innovations Readiness to digital innovations Ethical challenges Impact on traditional operations	Content analysis Comparative analysis

In the following section, the innovative models of the management of cultural institutions, the impact of digital technologies in the management processes, and the main challenges of digital transformation in the cultural sector will be discussed.

## Results

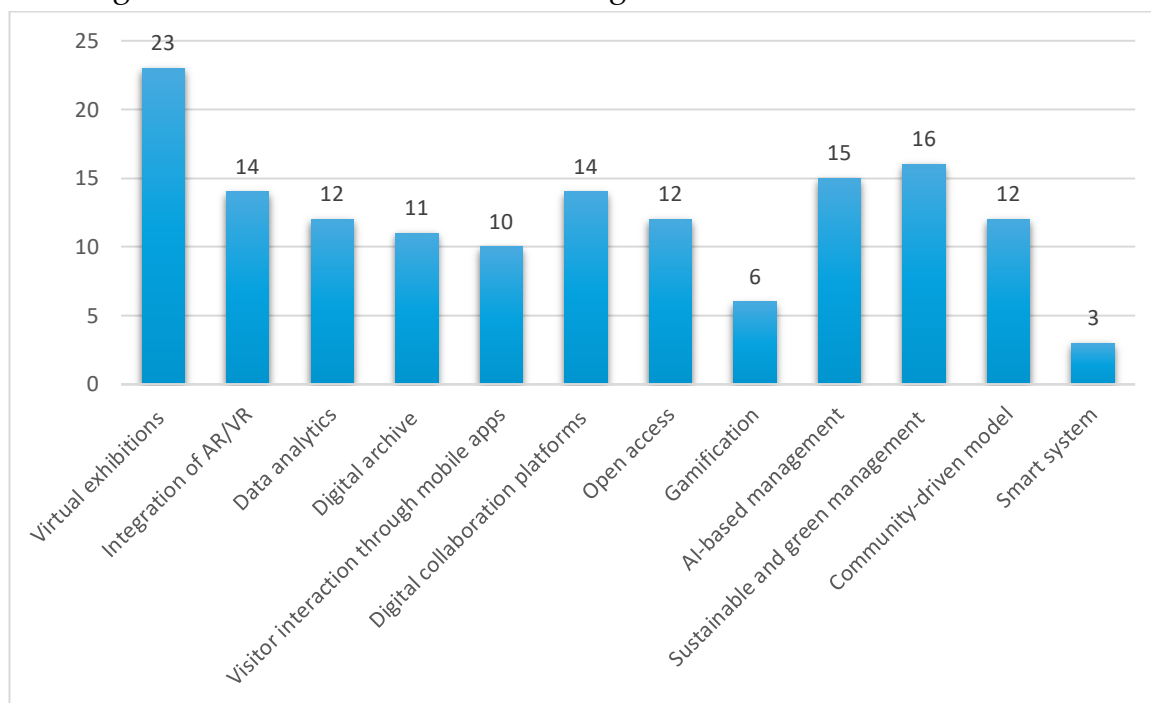
*What innovative models of cultural institution management are implemented in the digital age?*

The results showed that cultural institutions implement several innovative models to improve the management of everyday operations. These models are based on digital technologies and ensure operational efficiency and increased audience engagement. According to the findings, the virtual exhibition is a widely explained model (23 articles). It was revealed that the cultural institutions can organize virtual tours and demonstrate the collections virtually. For example, virtual exhibitions are efficiently applied by the Louvre Museum in Paris, increasing its accessibility considerably (Corona, 2021). Another frequently discussed model refers to sustainable and green management (16 articles). Some authors insist that incorporating this model by the cultural institutions optimizes resources, particularly improving energy efficiency (Takva et al., 2023).

Authors paid special attention to the use of AI-based technologies (15 articles). AI is introduced to curate exhibitions, enhance personalization, and improve visitor interactions. AI tools are also used to analyze the data and predict visitor preferences. The Mauritshuis in The Hague was presented as an example of an AI-based model where the AI instrument “Muse” is implemented to provide personalized recommendations on artworks (Siri, 2024). Some other models include integration of

AR/VR (14 articles), digital collaboration model (14 articles), data analytics (12 articles), and community-based management (12 articles). Notably, the smallest number of articles (3) concerned using innovative systems while managing cultural institutions. Figure 2 presents the analysis of innovative models of management of cultural institutions.

Figure 2. Innovative Models of Management of Cultural Institutions



The analysis of innovative models of the management of cultural institutions proves that the digital age is revolutionizing the operations of the cultural sector significantly, and various management models appear.

*What digital technologies impact the interaction between cultural institutions, the audience, and management processes?*

The literary sources demonstrated the profound impact of digital technologies on the activities of cultural institutions, particularly their management processes. For example, some findings revealed the potential of digital technologies to increase the accessibility of cultural collections and audience engagement (Corona, 2021; Li et al., 2022). Some authors describe the positive effect of digital technologies on managing cultural institutions, including planning, communication, human resource management, budget management, and resource allocation (Bannikova et al., 2023; Vărzaru & Bocean, 2024). The authors proved that the efficiency of cultural institutions is enhanced when digital technologies are implemented, mainly when they are helpful during crises (Hall, 2024; Moon, 2020). According to Choi and Kim (2021), the use of

digital technologies in cultural institutions contributed to the change of their role, customizing, the creation of new values, the enforcement of the relationship between an institution itself and its visitors, and, more importantly, the development of sustainability of cultural institutions.

Analyzing the scientific works, it was found that different digital technologies are applied within the process of management of cultural institutions. Most articles reveal the use of VR instruments (47 articles), AI-based technologies (52 articles), Big Data analytics (61 articles), chatbot and virtual assistant (55 articles), and online collaboration tools (108 articles.). The findings show that VR instruments create virtual exhibitions and increase accessibility. Also, VR technology is used to provide cost-effectiveness and organize training of cultural sector experts through simulation-based exercises. AI tools improve routine operations, personalization of visitors' experience, and decision-making procedures. Some works indicate that AI-based technologies are used for content analysis to assess the management strategies of cultural institutions.

Based on scientific works in the field, it was stated that big data can contribute to personalization, predictive analytics, resource optimization, financial management, and cultural event planning. In the literature, special attention was paid to the increasing role of chatbots and virtual assistants. The findings outlined that these technologies provide 24/7 support for the audience, personalization, and multilingual support. Virtual assistants help to organize virtual tours and support visitors with disabilities as well. Online collaboration tools were described as effective instruments for facilitating management procedures in cultural institutions. It was found that they assist team communication, remote project management, and cross-cultural collaboration. Besides, online collaboration tools contribute to improved coordination and crisis management.

Other digital tools used to manage cultural institutions include the following: social media platforms, blockchain, intelligent systems, digital archiving, interactive video content, and gamification. Table 3 presents a detailed analysis of the impact of digital technologies on the management of cultural institutions.

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*Table 3. Impact of Digital Technologies on the Management of Cultural Institutions*

<b>Digital technology</b>	<b>Impact</b>	<b>Number of articles</b>
1. VR instruments	Virtual exhibitions	16
	Increased accessibility	23
	Cost-effectiveness	4
2. AI-based technologies	Training experts in the cultural sector	5
	Automated operations	17
	Personalization	29
	Improved decision-making	22
3. Big Data analytics	Content analysis	4
	Personalization	29
	Predictive analytics	21
	Resource optimization and improved financial management	9
4. Social media platforms	Event planning	3
	Audience engagement	26
	Visibility	11
	Communication and community building	5
5. Blockchain	Targeted marketing	7
	Transparent financial transactions	1
	Enhanced security	5
6. Smart system	Protection of cultural heritage	4
	Visitor tracking	2
	Personalization	17
7. Digital archive and repository	Automated ticketing	3
	Enhance searching	4
	Efficient data management	19
8. Interactive video content	Virtual touring	17
	Education and training	23
	Creation of supplementary content	2
9. Gamification	Visitor engagement	28
	Involvement of younger audience	5
	Repeated visits	2
10. e-commerce platforms	Financial stability	2
	Membership scheme	2
	Operational efficiency	5
	Brand visibility	1
11. Chatbot and virtual assistant	24/7 support	2
	Personalization	23
	Multilingual support	14
	Guided tours	30
12. Online collaboration tools	Support for visitors with disabilities	26
	Team communication	26
	Remote project management	27
	Cross-cultural collaboration	25
	Improved coordination	23
	Efficient crisis management	40

Despite the prevailing positive impact of digital technologies on the interaction between cultural institutions and audiences and management processes, the research requires investigating the barriers and challenges caused by digitalization in the field of culture.

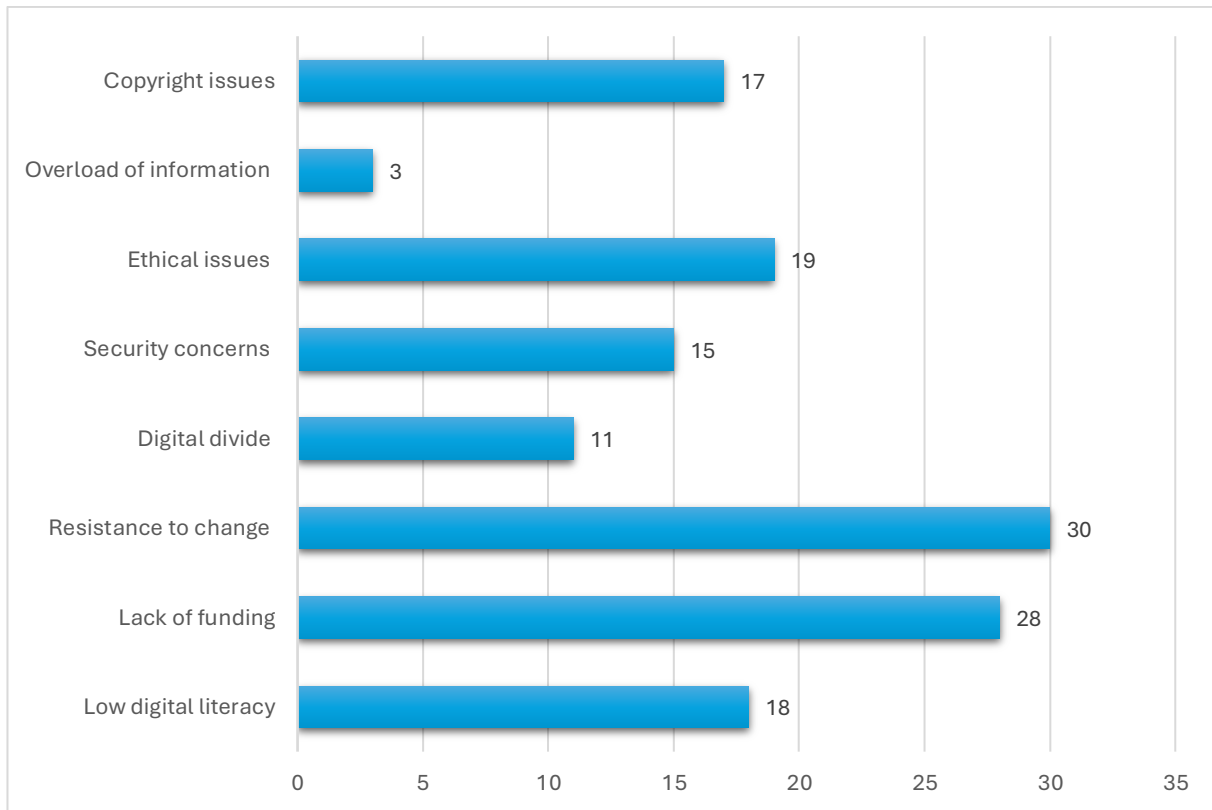
*What main barriers and challenges appear while digital innovations are being implemented in the field of culture?*

The findings showed that implementing digital innovations in the cultural sector presents specific barriers and challenges. Some articles (18) describe low digital literacy among the employees of cultural institutions. For example, Sanders and Scanlon (2021) revealed low digital literacy among citizens of developing countries and outlined it as a fundamental human right. Other findings indicated low digital literacy among females in comparison to men (Campos & Scherer, 2024) and in rural areas (Wang et al., 2022). The literature review proved that low digital literacy creates a considerable gap in the curation, management of cultural collections, and audience engagement.

Lack of funding was discussed in 28 articles. It was stressed that the implementation of digital technologies in the management of cultural institutions requires additional costs. The shortened budget of the cultural sector in some countries may cause the surface-level of digital transformations and not bring significant improvement (Kou & Chen, 2025). In the context of implementing digital technologies in cultural institutions, Nikolaou (2024) differentiates expenses on technology maintenance, formation of technology skills among personnel, costs associated with technology adoption, and introduction of new technologies created to replace an older version (technological obsolescence). Likewise, Kou and Chen (2025) stress the importance of funding talent support in the cultural sector.

Other challenges include resistance to change (30 articles). This resistance was found to occur at the organizational, individual, and learning-related levels (Scholkmann, 2021). Also, scientific sources associate the digitalization of management processes with copyright and ethical issues and security concerns. Figure 3 shows the overview of the barriers and challenges of using digital technologies to manage cultural institutions.

Figure 3. Barriers and Challenges of Using Digital Technologies in the Management of Cultural Institutions



Addressing these challenges requires comprehensive strategic planning, specific personnel training, and explicit policies on digital ethics. Overcoming these barriers and challenges may contribute to gaining advantages of digital innovation and increase the efficiency of cultural institutions.

## Discussion

The examination of innovative approaches to the management of cultural institutions in the digital age is based mainly on management theory (Bachynskyi, 2024; Bannikova & Mykhaylyova, 2023; Skačkauskienė, 2022), which reveals the theoretical principles of organizational effectiveness, leadership, human resources management, decision-making, communication, and performance evaluation. Further, it was revealed that these principles are implemented in the management process of cultural institutions, fostering innovations and positive digital transformations (Bălan, 2023; Kou & Chen, 2025; Pop et al., 2019).

Specific findings revealed that cultural management contributes to elaborating the fundamentals of the effective management system within cultural institutions (Wróblewski et al., 2019). It was found that cultural management is oriented toward

promoting sustainability and innovation in cultural institutions (Mateos-Ronco & Peiró Torralba, 2019). At the same time, several empirical research analyzed during the systematic literature review focused on the practical implications of change management and stated that an open management strategy is widely implemented nowadays (Adobor, 2021; Della Lucia et al., 2024). It allows the transformation of the role of museums and galleries in today's community and increases audience engagement.

Change management was described as a well-designed system assisting in overcoming internal and external changes that appeared due to the digitalization of cultural institutions (Moon, 2020) it was outlined that change management aims to adapt to new changes of the digital age as well as preserve cultural heritage and engage more visitors to cultural institutions using innovative approaches (Polyezhayev et al., 2024). In comparison, the findings demonstrated various changes within cultural institutions. For example, virtual tours, online lectures, digital exhibitions, AI-powered curation, and digital archiving were extensively implemented in cultural institutions during the COVID-19 pandemic (Corona, 2021).

Besides, innovation theory was outlined as a basis for analyzing innovative approaches to management in cultural institutions. According to recent findings, innovation theory is responsible for developing theoretical principles introduced for the improved performance of an institution, the promotion of research and development initiatives, and technological advancement (Suparwadi et al., 2024). Special attention was focused on the advantages of digital innovation to the management of cultural institutions. It was found that innovations cause increased accessibility, cost-effectiveness, automation of routine tasks, and improved decision-making. Some digital technologies (e.g., AI, VR, Big Data) contribute to personalizing cultural projects that enhance audience engagement (Adobor, 2021; Corona, 2021; Li et al., 2022). At the same time, some findings concentrate on the challenges of using digital technologies to manage cultural institutions. They included the following: lack of funding to implement digital technologies (Kou & Chen, 2025; Nikolaou, 2024) and low digital literacy among personnel of cultural institutions that require additional expenses for their training and retraining (Nikolaou, 2024; Sanders & Scanlon, 2021). According to the research results, copyright, ethical, and security concerns are other challenges.

The research on innovative approaches to managing cultural institutions in the digital age has significant implications for theory and practice. Theoretically, it enriches the scientific discourse on digital transformation since it could integrate theoretical concepts and theories from cultural management, innovation theory,

management theory, and change management. These findings can be used to reshape the management strategies of cultural institutions during the digital age and optimize their activities. Practically, the findings offer valuable information for managers of cultural institutions striving to orient toward the complexities of digital innovation. Understanding the advantages and challenges of digital technologies for managing cultural institutions may contribute to creating a sustainable and efficient cultural environment that is attractive to the audience. Moreover, the findings are essential to enhance the resilience of cultural institutions during crises.

Despite several studies on digital transformation in cultural institutions, a significant gap remains in understanding the specific strategies for managing museums and galleries. It was noted that the existing studies mainly focus on digital transformation and audience engagement in the stable landscape. However, there is limited research on the potential of emerging technologies, particularly AI-based tools for personalization, digitalization of archives, and creation of virtual collections, which can assist cultural institutions in maintaining operations during times of instability. Importantly, we found a lack of empirical research concerning preserving cultural heritage during war-affected times.

## **Conclusions**

Concerning the first research question, innovative models based on digital technologies were found to be used in managing cultural institutions. They are aimed at ensuring operational efficiency and increased audience engagement. These models include the following: virtual exhibition, AI-based technologies, integration of AR/VR, digital collaboration model, data analytics, community-based management, sustainable and green management, open access to cultural collections, intelligent systems, and community-driven model. According to the findings, virtual exhibitions, AI-based technologies, integration of AR/VR, and sustainable and green models were most widely discussed in scientific literature.

In answering the second question, it was revealed that digital technologies profoundly impact on the management of cultural institutions. This refers to the increased audience engagement. It was proved that the management processes were facilitated through digital technologies. The findings showed they positively changed planning, communication, human resource management, budget management, and resource allocation. Special attention was paid to the accelerated use of digital technologies to manage cultural institutions, particularly during COVID-19. According to the results of the systematic literature review, digital technologies contribute to creating virtual exhibitions, cost-effectiveness, training organization, routine operations improvement, and personalization.

In the context of the third question, it was revealed that specific challenges exist in using digital technologies to manage cultural institutions. Some include lack of funding, low digital literacy, resistance to change, and ethical issues. The findings demonstrate that the challenges appearing in the management process do not exceed the positive effect of digitalization on the environment of cultural institutions. This means that it is worth continuing the digital transformations of cultural institutions.

To effectively implement digital technologies, the recommendations to managers of cultural institutions were outlined to achieve organizational goals and continue the preservation of cultural heritage. Firstly, a digital transformation strategy that integrates technological advancements with the activities and values of cultural institutions is required. This strategy should include long-term goals, mainly branding the institution, engaging the younger audience, and integrating virtual events. Secondly, it is necessary to invest in training personnel of cultural institutions to develop digital skills so they can operate effectively in the digital environment. Regular training programs, workshops, and online seminars can be implemented within personnel training and retraining schemes. Thirdly, digital technologies can be used to support diverse audiences. Special attention must be paid to introducing multilingual virtual assistants, chatbots, audio guides, interactive interfaces, and virtual ticketing. These technologies may create positive experiences among individuals and encourage their revisit.

Future research should focus on developing resilience and adaptation strategies for cultural institutions during war and crisis. The investigation of the impact of digital technologies on the protection of cultural heritage in conflict zones is essential today. It is especially worth studying if one considers the experience of Ukraine, where many cultural institutions face the adverse effects of military aggression. The collaboration of researchers and cultural experts can contribute to developing sustainable and technology-driven management models to protect cultural institutions in times of conflict.

## **Ethical Considerations**

This study was conducted in accordance with ethical standards. Prior to data collection, informed consent was obtained from all participants, to ensure their voluntary participation. The confidentiality and anonymity of all respondents were strictly maintained throughout the research to protect their privacy and well-being.

## **Conflicts of Interests**

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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