

Prospects Of Using Modern Technologies In The Conservation Of Findings In Museum Collection Funds

Noyibjon Maripjonvich Khudoyorov

Senior teacher of the "History of Uzbekistan" department of Andizhan State University, Republic of Uzbekistan, e-mail: noyibxudoyorov880@gmail.com

Samandarbek Sobirjon ugli Ruziboev

Student of Andizhan State University, Faculty of History,
e-mail: roziboyevsamandar00@gmail.com

Abstract: The article considers the importance of preserving museum collections and their digitization, as well as the role of modern technologies in museum work. Conservation and digitization processes for preserving museum collections are described, and their long-term preservation and importance for future generations are discussed. Technologies such as digital models, 3D technologies and augmented reality create new opportunities in the preservation and presentation of cultural heritage to the general public.

Key words: Conservation, digital model, digital archiving, 3D scanner, pigment, augmented reality (AR), virtual museums, preservation of cultural heritage.

INTRODUCTION

Museum collections contain the most unique and valuable treasures from different periods of human history, and they require a great responsibility to preserve the findings and pass them on to future generations. This is based on the Law "On Protection and Use of Archaeological Heritage Objects" adopted by the Legislative Chamber of the Republic of Uzbekistan on June 16, 2009 and approved by the Senate on August 29, 2009 [1]. A museum is a non-profit, permanent community service institution that researches, collects, preserves, interprets, and displays tangible and intangible heritage [2].

RESEARCH METHODS

When art confronts us as the other of reality and conceptual discourse, it encourages us to think about ourselves and current events in a new and different way [3]. The main goal of conservation is to preserve the finds for a long time without damaging their originality. Conservation is not only for museums, but also a means of preservation of historical monuments and a process of scientific and cultural importance. In particular, the process of repairing archaeological finds, historical objects and works of art requires special attention and skill. Especially the role of modern technologies in this field is increasing more and more. Today, digital technologies and new scientific approaches help to improve the efficiency of the conservation process.

RESULTS AND DISCUSSIONS

They not only ensure the preservation of finds, but also play an important role in making museum collections available to the general public through digital archiving. Modern technologies such as 3D scanning, materials science, chemical analysis and microclimate control are creating opportunities for careful preservation of findings, as well as for their wider study. Therefore, by applying new technologies to the conservation process, it becomes important to preserve museum funds for future generations and to further increase their value. As a result of the interdependence of conservation and modern technologies, the methods of preservation of finds in museums are improving today. In this regard, the use of modern technologies is the most effective approach to the careful preservation of our historical and cultural heritage and its dissemination to the general public.

We decided to start this part with a deep philosophical reflection of museologist Jan Dolak: "There is no doubt that knowledge is stored in museums, although not as a record of something, but as original documents. The loss of such "records of knowledge" and their repositories - libraries, museums, etc. - does not threaten the existence of man as a species, but his civilization. The museum collection thus records the history of our ideas as a product of human activity"[4].

There are many types of museum collections, among which the preservation and conservation of works of art, archeological finds, and natural history specimens play an important role. One of the main areas of preservation of collections is "preservative conservation". Waller states, "Preventive conservation plans are necessary for large and diverse collections because they serve to ensure a continuous process of preservation" [5]. Also, as a result of research on natural history collections, the need for conservation work was determined. According to a Russian researcher, due to the huge layer of cultural objects stored in museums, it becomes more and more difficult to preserve them [6].

Cato, Dicus, and von Endt write in their article, "Research is a priority in the conservation of natural history collections, which not only reflects the importance of art and historical collections, but also ensures their preservation" [7]. In museums, conservation is not only important for the preservation of collections, but also a decisive factor in passing them on to future generations. McGinley says in this regard: "The preservation and management of collections is a necessary condition for the growth of museum collections and their future use" [8].

According to Holdgaard (2011), there is no clear conceptualization for a virtual museum: online museum, electronic museum, hyper museum, digital museum, cyber museum, web museum, among others, there are many possible names for a virtual museum names are available [9]. Digitalization technologies of modern museums have become an important tool in preserving cultural heritage and making it available to the general public. T.V. Fomichev and V.I. Kataev interprets the phenomenon of digitization in a narrow sense and describes it as a change of information [10].

We do not agree with this view. Because with the help of digitization, the objects in the museum collections are stored in a high-quality digital format, which ensures their long-term preservation. These technologies are especially important in protecting museum objects and reducing possible damage to them. In general, the purposes of modeling in museums generally fall into one of three main categories. First, as a clear and widespread means of documentation, 3D models help in the preservation and conservation of physical artifacts, Second, they enable new ways of conducting scientific research on collections and sites. Third, 3D models offer new opportunities for public engagement at exhibitions, heritage sites and online [11]. For example, as noted in Smith's research, "digitalization technologies are of great importance in documenting cultural objects, especially for conservation, these processes are considered important" [12]. And 3D scanning technologies are one of the most effective tools of the digitization process. One of the best examples of this technology in the world practice of creating virtual 3D museums of archaeological artifacts is the Hampson Virtual Museum (<http://hampson.cast.uark.edu>) developed by the Center for Advanced Spatial Technologies [13]. This technology makes it possible to convert museum objects into a precise and fully digital model, which increases the possibility of viewing and preserving them virtually. As noted by Gallery Systems, "3D scanning provides new opportunities for preservation and study of cultural objects through digital models" [14].

Also, 3D scanning data allows to almost predict damaged and missing parts [15]. Digital models are especially important for archaeological and art works with complex structures. According to the research of the Cultural Heritage Institute, "digital models created by 3D technologies allow virtual study and presentation of museum objects, which helps to study without damaging their original state" [16]. Virtual reality provides all possible practical activities: entering the virtual world, imitating it, interactive communication [17]. Virtual museum "is an intangible institution that is open to the public and conducts research on material witnesses of man and his environment" [18]. Augmented reality (AR) is a highly complex system that combines elements of the real world with computer-generated sensory inputs, visual simulation, and digital synthesis. It combines real and virtual environments and interacts in real time [18].

Digital archiving is an integral part of the digitization process. This system makes it possible to securely store museum collections in digital format and protect them for future generations. Digitizing the museum collection has many advantages. Therefore, the advantages proposed by Rotimi-Williams Bello, Ahmad Sufril Azlan Bin Mohamed are as follows: 1. Space saving and portability – volumes of modified material artifacts can be stored on a single carrier 2. Rapid deployment, access and modification of data 3. It is easy to access and retrieve the record 4. It protects the artifacts from theft, fire, vandalism, temperature, moisture and other hazards [19]. Smith writes in his research: "Digital archiving technologies are of great

importance in protecting museum collections from loss or damage, and they enable long-term preservation" [12].

X-ray and infrared imaging technologies are widely used in the in-depth analysis of museum objects. These technologies play an important role in analyzing museum collections, viewing their internal structure, and assessing the state of conservation. According to Texas A&M University research, "X-ray and infrared imaging methods are used to determine the internal structure and conservation needs of museum objects" [20]. The preservation of works in museum collections often depends on their chemical and physical properties. In the 18th century, the first chemical studies were carried out in excavations at Pompeii and Herculaneum, and this process was further developed in the 19th century with the discovery of new pigments. For example, the English chemist G. Davy analyzed the composition of ancient paints in 1815, and this served as the basis for modern preservation technologies [21]. In addition, imaging analysis and diagnostics applied to artwork - visible light, ultraviolet (UV)-visible fluorescence, infrared reflectography (IR), field-light imaging, transmitted light lic and X-ray - played an important role in archaeometry as useful [22]. The use of analyzes and chemical methods allows controlling not only the characteristics of pigments, but also external factors that affect their preservation, such as temperature, humidity, and lighting conditions. Therefore, it is important to create the right microclimate and optimal storage of works in the process of conservation, which prolongs the life of exhibits in museum funds [22].

Advantages of the latest technologies successfully used in museums:

Facial recognition technology is a type of artificial intelligence that uses computer vision algorithms to identify and recognize people based on certain facial characteristics, such as age, gender, ethnicity, and other demographics. This technology has potential applications in the art museum context [23].

Virtual and augmented reality technologies offer visitors new ways to explore and experience works of art in art museums. Virtual reality (VR) technologies enable remote or virtual tours that allow remote visitors to view works of art online [23].

Improvements in object recognition technology will enable art museums to better store artworks, as well as access digital records of artworks. With the help of artificial intelligence object recognition software, museum staff can identify which works need conservation and track changes over time, and digital records can be used to create a virtual record of artworks and make them accessible to a wider audience [23].

Digital records storage is the process by which digital records such as documents, images, videos and audio files are stored and stored securely. Using AI technology, digital records can be effectively tracked and stored, making them easier to access and manage over time [23].

Predictive analytics and ML are techniques used by AI systems to predict future outcomes based on current data. They are used in various fields such as marketing, healthcare, and finance to identify trends and make decisions that provide a competitive advantage [23].

Natural language processing (NLP) is a branch of artificial intelligence that focuses on the ability of computers to understand, interpret, and generate human language. The technology has applications ranging from voice recognition to understanding customer feedback. With NLP, computers can process and understand natural language, allowing them to respond more accurately and communicate with users in more natural ways [23].

Robotic assistants, interactive displays, and chatbots are examples of AI technologies used to interact with humans. These technologies can be used in a variety of applications, from customer service to entertainment. For example, robot assistants can be used to assist customers, such as helping them find products or providing recommendations [23].

CONCLUSION

So, this article analyzes the latest scientific approaches to preservation of museum collections and conservation technologies. According to Jan Dolak, knowledge is stored in museums as original documents, and the loss of such records of knowledge is a threat to civilization. Conservation and preventive conservation are important in the preservation of museum collections, works of art, archaeological finds, and natural history specimens. The research examined the role of 3D modeling, digitization, virtual and augmented reality technologies in the preservation and presentation of museum collections. These technologies create new opportunities for preserving museum objects in high-quality digital format, reducing damage and making them available to the general public. In particular, 3D scanning and virtual

reality technologies have been shown to be effective tools for conservation, scientific research and public engagement. The results of the article show that modern technologies play an important role in the preservation and presentation of museum collections. These technologies are of great help not only in preserving historical and cultural heritage, but also in conveying them to future generations and making them available to the general public. Therefore, the use of technological innovations in museums is necessary for more efficient implementation of future conservation and preservation works.

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