
CULTURAL HERITAGE AND INNOVATIVE TECHNOLOGIES IN THE MUSEUMS OF TASHKENT

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ABSTRACT: This article deals with the application of digital technologies on the example of the Tashkent Polytechnic Museum. The impact of digitalization process on museums of Tashkent is considered. The advantages of using new digital technologies in museum exhibition are studied. The main attention in the work is focused on new technologies that create a virtual environment and interactivity for visitors. The development of digital technologies has a purely integrative character and creates favorable conditions for information interaction.

KEYWORDS: Museum, digital technologies, digitalization, culture, art, visualization, innovation, visitor, “projection mapping”, interactive, 3D.

INTRODUCTION

Digital Transformation and Innovative Technologies in Tashkent Museums

In the 21st century, significant changes are occurring in the cultural domain, closely tied to digitization. Digitization refers to the process of converting information into digital form, leading to new perspectives for development. This transformation enhances information accessibility and ushers in a new era driven by authentic data. Modern human activities heavily rely on advanced digital technologies to navigate information processes effectively. Acquiring, storing, processing, and utilizing information efficiently are essential skills in today's world.

Digital technologies play a pivotal role across various human activities, solving numerous critical tasks such as reducing labor and material costs, automating workflows, ensuring prompt action, and maintaining digital archives. Digitization has been actively integrated into the cultural sphere, not only reshaping access to cultural values but also enabling new forms of interaction with cultural content. Museums benefit significantly from digitization, making exhibition materials, artifacts, and collections more accessible to a broader audience. The transformation of museum spaces into more dynamic, mobile, and virtual environments is gradually taking place.

The process of museum design is intrinsically linked to envisioning the future. While predicting the future is challenging, museums continuously strive to incorporate innovative approaches to remain relevant. This ongoing renewal disrupts the static nature of traditional museums, integrating them more deeply into urban environments and reshaping their societal roles. Consequently, the barriers between visitors and exhibits are diminishing, fostering greater

interactivity. Modern museums must strike a balance between preserving historical authenticity and adapting to new exhibition formats that appeal to contemporary audiences.

Digital technologies such as 3D modeling, digitization, archiving, and visualization significantly expand the informational scope of museum artifacts. They allow for detailed representations of internal and external data fields, visually enhancing exhibitions and creating immersive experiences for visitors. These technologies facilitate the preservation of historical facts, the realization of creative ideas, and the development of a positive, modern museum image.

To immerse visitors in history and create an appropriate atmosphere, museums utilize lighting, audio, video, and animation technologies. In Uzbekistan, initiatives like the "Living Museum" project are being implemented to modernize museums with audiovisual guides, interactive zones, and synchronized translation systems for foreign tourists. Digital monitors displaying translated texts and QR codes are also being introduced. Efforts to improve museum marketing and service monetization include developing websites, mobile applications, and promotional campaigns in airports, public spaces, and transportation hubs.

The Tashkent Polytechnic Museum stands out as a prime example of integrating modern digital technologies. It features interactive kiosks providing detailed information about exhibits. The first floor of the museum highlights the history of Uzbekistan's automobile industry, which began in 1994 through a partnership with South Korea's Daewoo. Interactive kiosks near the exhibits offer insights into the country's automotive history. A distinctive feature of the museum is its 3D pyramid—an interactive holographic device displaying real holograms and 3D effects without requiring additional equipment like 3D glasses. These pyramids offer unique content experiences, from animated logos to product advertisements, and allow easy content updates via USB or a shared network.

In the Polytechnic Museum's 3D pyramid, visitors can view rotating, appearing, and disappearing projections of automobiles, creating an engaging and educational experience for all age groups, especially younger visitors. This innovative approach demonstrates the power of digital technologies in transforming museums into vibrant, interactive spaces. The museum also features various modern installations created by students of the Turin Polytechnic University (Tashkent). These exhibits are accompanied by "binaural sound technology", a type of audio recording in two channels designed to replicate the way human ears perceive sound. This technology creates a 3D auditory experience, immersing visitors in the sound environment during playback [9].

In another hall on the first floor, visitors can experience an "interactive show" made possible through "projection mapping". One of the most fascinating exhibits in this section of the museum is a fully disassembled "Spark" car, which vividly demonstrates the complexity of modern automotive design. The projection mapping on the "Spark" car creates the illusion of the vehicle moving at different speeds and through various seasons. This exhibit's uniqueness and interactivity lie in its accessibility and engaging presentation, showcasing the purpose and functionality of the vehicle.

Museum specialists and staff meticulously update information about upcoming events and news on the museum's official website: [<https://politomuseum.uz>] (<https://politomuseum.uz>). The site includes photo albums of the museum's exhibits and an "interactive workshop" section. Updated

in 2023, the website underwent technical improvements to enhance its functionality. Designed to align with the museum's themes, the website allows visitors to access relevant information online.

In conclusion, digital technologies expand museum spaces, enhancing their informational accessibility and appeal. This is achieved through technical special effects and by attracting younger audiences who prefer exploring the world with modern technologies. Digital tools also promote the museum effectively within the broader museum community.

Today, museums are actively adopting multimedia formats, with content and design closely tied to the capabilities of the digital medium. The freedom of choice offered by these technologies appeals to diverse audiences, and the combination of targeted messaging, advertisements, and audience selectivity makes communication more effective.

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