

**CREATION OF 3D OBJECTS IN APPLIED AND DIGITAL ART
USING MODERN TECHNOLOGIES**

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ABSTRACT	KEYWORDS
<p>This article is devoted to the analysis of modern technologies used in the creation of objects of applied and digital art. The discussion includes tools and methodologies such as virtual and augmented reality, artificial intelligence, generative algorithms, and digital media. Special attention is given to the integration of these technologies into applied art and to the transformation of visual art into interactive digital forms. The article analyzes challenges related to authorship, sustainability, educational requirements, and the aesthetic considerations of digital creativity.</p>	<p>Digital art, applied art, virtual reality, augmented reality, artificial intelligence, generative algorithms, digital design, interactive technologies, contemporary art, artistic technologies.</p>

Introduction

The scientific novelty of this article lies in a comprehensive analysis of the influence of modern technologies (AI, generative algorithms, AR/VR, digital media) on digital and applied art, in identifying the transformation of the artist’s role, methods of creation, and educational preparation, as well as in formulating practical recommendations that take into account sustainability, ethics, and the interactivity of objects.

In recent years, the influence of modern digital technologies on artistic practice has become particularly prominent. Digitalization, the use of the Internet of Things, augmented and virtual reality (AR/VR), as well as artificial intelligence (AI) and generative algorithms, open new opportunities both for digital art and for applied art, meaning those forms that combine aesthetic and utilitarian functions. This article examines the primary directions of development and the key factors driving this transformation.

First, the very nature of the artistic process is changing: researchers and practitioners now focus not only on traditional forms (painting, sculpture, decorative and applied arts), but also on multimedia, interactive installations, generative systems, and mixed and virtual environments. For example, the work “The Development Trend of Digital Art in the Age of Artificial Intelligence” demonstrates that AI has become an “important tool” in the creation of digital art, promoting the emergence of “intelligent, autonomous, and diverse” artistic forms [1]. In addition, the academic review “Towards

sustainability assessment of artificial intelligence in artistic practices” emphasizes that the introduction of AI technologies into art creates rise to a new set of issues, including those related to sustainability (energy consumption and the life cycle of digital objects) [2]. Thus, it becomes clear that digital technologies do not simply add new tools, but restructure the very paradigm of artistic practice. Second, applied art (design, decorative and applied works, objects of functional purpose) is undergoing significant transformation driven by digital technologies. Digital modeling, 3D printing, CAD systems, and interactive elements are becoming part of the creation process. For example, the article “The Embodiment of Digital Art Elements in Traditional Cultural and Creative Product Designs” shows how digital art elements are integrated into traditional cultural products, forming hybrid expressions that combine applied art and digital media [3]. Furthermore, the work “Application of digital technology in environmental art design” demonstrates the use of network-based algorithms, neural networks, and digital analysis in the design of art landscapes (green plantings, landscape coverings), meaning that digital technology is also penetrating utilitarian and applied environments [4]. Consequently, the boundaries between “art” and “design” are becoming increasingly blurred, and digital tools are functioning both as a medium and as a means of artistic expression.

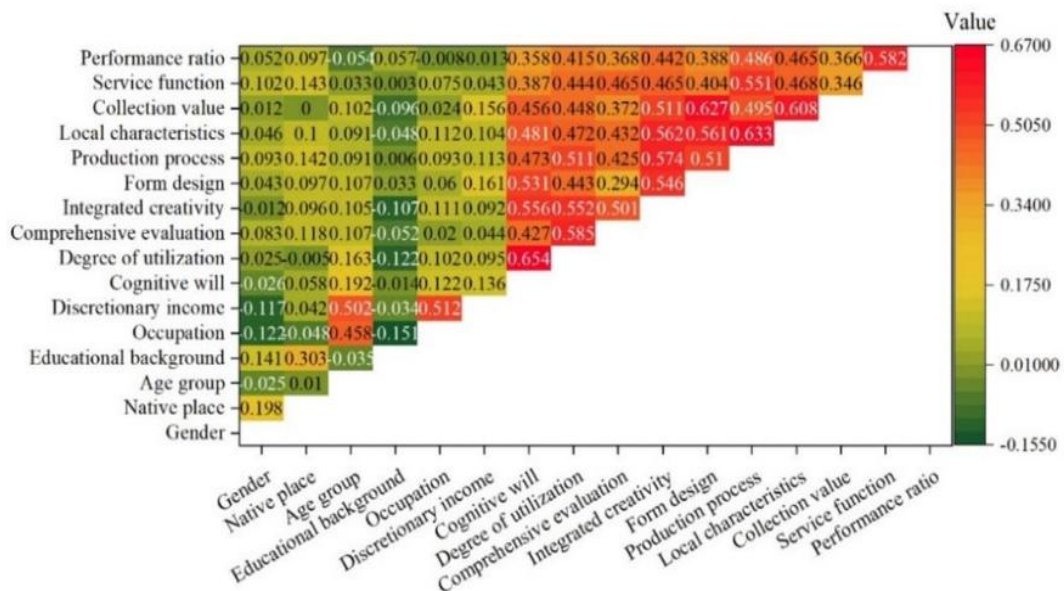


Figure 1 – Results of the Correlation Analysis (Zheng J.)

Analysis of current research shows that the integration of digital art into traditional cultural and creative products affects audience perception and behavior. Correlation data (Pearson, $P < 0.01$) indicate that the age of respondents is positively associated with interest in cultural identity, deeper product evaluation, comprehensive creativity, and formal design [3]. This means that a more mature audience demonstrates an increased willingness to perceive traditional cultural forms enhanced by digital technologies. At the same time, a higher level of education is associated with a lower tendency to value applied and creative elements in products that incorporate digital art, particularly in terms of their practical use. Income, by contrast, positively correlates with interest in cultural content, technological sophistication of production, and the collectible value of such products. This reflects a growing focus on digital craftsmanship and art objects as culturally significant and potentially investment-oriented items.

Furthermore, cultural identity directly reinforces users’ interest in the digital interpretation of traditional art, including production processes, local characteristics, functionality, and aesthetic value. Thus, digital technologies not only modernize traditional creative products but also become a tool for strengthening cultural continuity and forming hybrid expressions that combine craftsmanship, design, and digital media.

Third, the technological context is not merely a set of tools, but also a media environment – a system comprising the viewer, technology, and artist, as well as an infrastructure of interaction. The scholarly article “The Innovative Application of Visual Communication Design in Modern Art Design” examines how visual communication becomes digitally and media-oriented: design that includes interactive components and network-based communication becomes an integral part of modern artistic practice [5]. In this regard, digital technology transforms not only the form and material, but also the manner in which art is created, perceived, and disseminated.

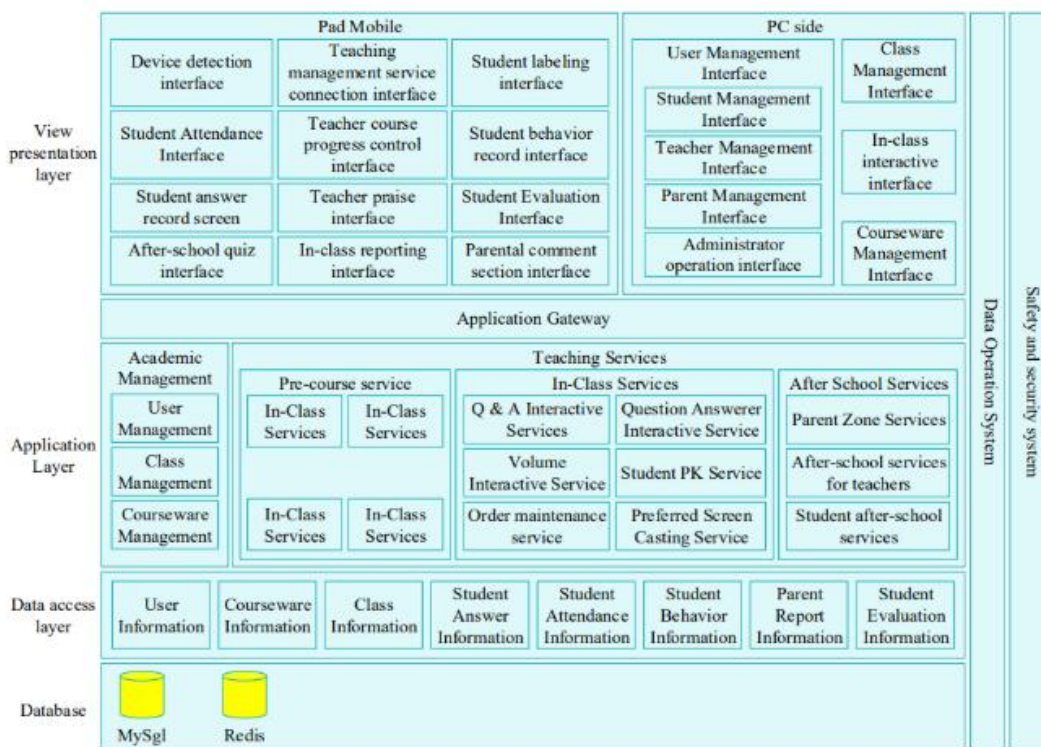


Figure 2 – Example of a multi-layer architecture of a digital platform used for the creation, management, and integration of objects of digital and applied art

Finally, it is important to emphasize that all of the foregoing also gives rise to a number of new challenges: from issues of authorship and originality to matters of sustainability and education. The purpose of this article is to analyze how contemporary technologies affect the creation of applied and digital art objects, identify the principal technological directions, discuss methodologies and transformations, and enumerate the current challenges and development prospects.

Scientific research of recent years dedicated to digital art and generative technologies demonstrates a significant shift: artificial intelligence (AI) is no longer merely a tool but is becoming a creative agent and partner in the art-making process.

Key trends and AI impact:

1. Increased autonomy and diversity. AI technologies, as noted by scholars, make digital artistic creation more intelligent, autonomous, and diverse [1].
2. AI as a new medium. Generative models (for example, text-to-image), analyzed in the study “Art and the Science of Generative AI,” are considered a new medium that influences aesthetics, creativity, and the art industry overall [6].

Research Questions Raised by Generative AI

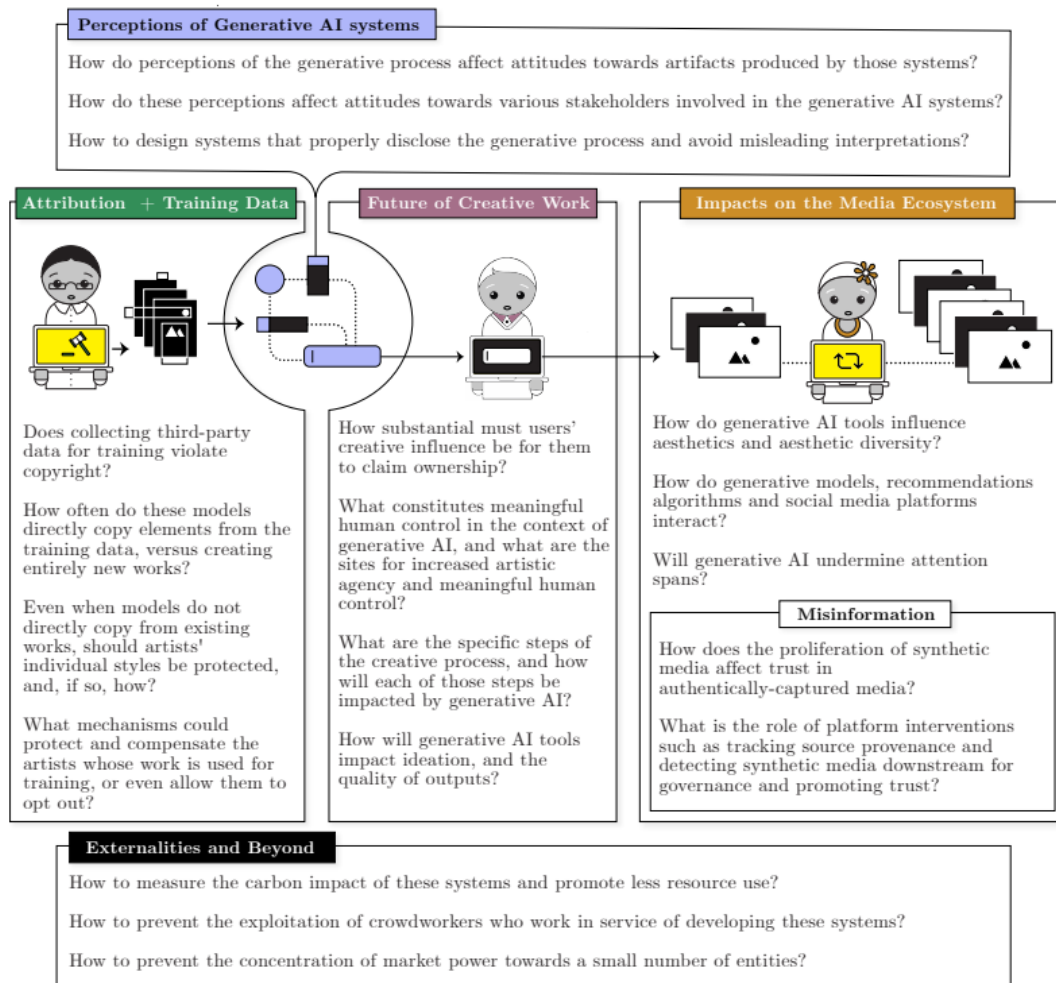


Figure 3 – Research questions arising in connection with the use of generative AI in art

3. Democratization of creativity. Scholars emphasize that AI tools, such as stylistic transformation and image generation, allow non-technical users to actively participate in the artistic process, reducing the entry barrier [7].
4. Expansion of application. The application of generative AI extends beyond the “screen.” The study “Research on the Application of Generative AI in Digital Art Design for Intangible Cultural Heritage” demonstrates its use, for example, in digital art design related to intangible cultural heritage [8].

Thus, contemporary scientific works unequivocally indicate that AI and generative systems are not merely auxiliary programs but represent a new environment and a full-fledged partner for the artist. This transforms the role of the creator and the very process of making art, raising critical questions of authorship, aesthetics, and artistic autonomy.

Scientific research confirms that digital media technologies have become an inevitable trend and a key factor transforming applied art and design.

Main directions of influence:

1. Modernization of design art. The introduction of digital media changes the appearance of contemporary design art, influencing its principles and methods [1].
2. Transformation of graphic design. A deep integration of digital media art into graphic design is taking place, which not only changes design practices but also affects its sustainable development [9].
3. New forms of interaction (museum design). The use of new media and digital art in exhibition design, particularly in museums, creates interactive environments that radically alter how audiences interact with exhibits [1].

Applied art and design increasingly incorporate digital media tools. This incorporation does not merely digitize processes but leads to a substantial expansion of the functionality and formal capabilities of objects (whether furniture, textiles, or exhibition spaces). The result is a more flexible and dynamic connection between the means of creation and the final form of the work or product.

Research dedicated to education, institutions, and the infrastructure of the artistic process in recent years has focused on the ongoing digitalization and its effect on the training of specialists.

Key requirements for art education:

1. Transformation of education through big data. Scholars note that digitalization, big data, and media platforms fundamentally transform art education, as well as the training process for specialists required to work in the field of digital art [10].
2. Innovations in teaching. One academic study analyzes how, in the era of new media, institutions of higher education must update their instructional methods in digital media art and design to comply with current industry requirements [11].

Thus, educational and institutional research is unified in its view: to ensure effective training of artist-designers capable of working in digital and hybrid environments, it is necessary to update academic programs and infrastructure. This update must focus on cultivating interdisciplinary skills that combine art and technology. Accordingly, literary sources confirm that digital technologies shape not only new artistic forms but also new methodologies, infrastructure, and professional competencies. This makes the analysis of the transformation of applied and digital art highly relevant from both theoretical and practical standpoints.

We have examined the key aspects of the influence of contemporary technologies on the creation of applied and digital art objects – how they are implemented in practice and what methodologies are being formed.

1. Technologies and Methods: Capabilities and Transformations. The study “The Development Trend of Digital Art in the Age of Artificial Intelligence” demonstrates that the use of AI in digital art “has gradually become more intelligent, autonomous, and diverse” [1]. The authors describe how AI-based tools allow not only the simulation of an artist’s creative process but also the generation of unique

forms. This opens new directions: from the passive use of AI as a tool to active partnership with it. The article “Analysis of Utilizing Artificial Intelligence to Improve the Efficiency of Digital Media Art Creation” also emphasizes that the application of AI in digital media arts promotes a substantial increase in the efficiency of the creative process, particularly in graphic design, animation, and sound design. These data confirm that the technological shift affects not only the form and content of artistic works but also the very methods and processes of creation: digital modeling, image and sound generation, interactivity, and automation.

2. Applied Art and Design: Integration of Digital Tools. In reviewing applied art (decorative and applied objects, interior design, textiles, ceramics), the study “The Role and Impact of Sustainable Design in AI Digital Media and Arts” notes that sustainable design becomes an important component when working with digital media and AI-based technologies in art and media. The author shows how social, economic, and environmental aspects are incorporated into design-thinking when developing digital media art objects. In addition, the study of Chinese practice “Digital art work and AI: a new paradigm for work in the contemporary art sector in China” demonstrates that artists in China are forming a new category – digital art work – in which design, media tools, and AI are closely interwoven [12]. This example confirms that applied and digital art are increasingly integrated: the design of the object, the media environment, and interactivity become inseparable. Consequently, in the applied field, digital technologies provide:

- the expansion of an object’s functionality and aesthetics;
- new production methods (for example, digital modeling, 3D printing, interactive sensors);
- a shift in the artist/designer’s role from a craftsman-producer to a mediator between technology and environment.

3. Challenges: Sustainability, Authorship, Ethics. One of the most significant challenges is the issue of sustainable development and ethics in using AI and digital technologies in art. In “On the environmental sustainability of AI art(s)” the authors examine in detail the environmental footprint of AI-based art – energy consumption, the use of large datasets, and hardware requirements [13]. The study “Environmental and Social Sustainability of Creative-AI” also underscores that Creative-AI projects bring both opportunities and social and ethical risks: authorship, property rights, labor distribution, and the impact on traditional creative forms [14]. This body of research shows that the technological transformation in art requires a new conceptual understanding: artists and designers become not only creators of forms but also bear responsibility for the societal and environmental impact of their digital works.

By combining findings from the three previous areas, the following generalizations may be noted:

1. The role of the artist is being transformed. In the digital environment, the artist becomes an operator, a curator of data, and a generator of forms interacting with algorithms. As noted above, AI offers autonomy but requires new skills from the artist: working with algorithms, selecting data, and managing the process.
2. The form and environment of creativity are expanding. Art objects extend beyond the screen: interactive media, applied forms, and environmental design become part of artistic expression. For example, researchers illustrate how sustainable design is integrated into digital media art.

3. Technologies have a dual role. On one hand, they provide opportunities: speed, variability, new forms, and interactivity. On the other hand, they pose limitations: resource intensity, issues of sustainability, authorship, and ethics. Scholars emphasize the environmental and social context.
4. Applied and digital art are increasingly converging. Design, media, technology, and artistic practice are becoming a unified field: the artist-designer-technologist must navigate each of these domains.

Table 1 – Comparative Analysis of Contemporary Technologies in Digital and Applied Art

Technology	Primary Application	Impact on Aesthetics / Functionality	Challenges / Limitations
Artificial Intelligence (AI)	Image, graphics, and 3D-model generation; data analysis	Enables the creation of unique forms, increases autonomy and variability of objects	Authorship, ethics, energy consumption, complexity of mastering the tools
Generative Algorithms	Creation of patterns, visual effects, interactive media	Provide design variability and unexpected artistic solutions	Quality control, predictability of outcomes
AR/VR (augmented and virtual reality)	Interactive installations, environmental design, virtual objects	Expand the perceptual space, create interactivity and immersion	Equipment cost, implementation complexity, user training
3D Modeling and CAD	Design of applied art objects, furniture, textiles	Allow precise modeling, integration of digital components, preparation for 3D printing	Require technical skills, may be labor-intensive
Digital Media and Sensors	Interactive objects, multimedia installations	Add interactivity, multimedia elements, and new aesthetics	Equipment reliability, energy consumption, integration with design

On the basis of the analysis, the following recommendations may be proposed for practitioners (artists, designers) and researchers:

1. When implementing AI in artistic or applied production, it is essential to consider sustainability – not only aesthetic but also environmental and social.
2. Artists and designers should cultivate skills in working with algorithms, data generation, and interactivity, shifting from perceiving AI as a mere “tool” to viewing it as a “technology co-author.”
3. In designing objects, it is important to integrate design, media, and technology as elements of a unified environment rather than treat technology solely as decoration.
4. Institutions (artist guilds, galleries, educational programs) should promote discussions regarding authorship, rights, and the ethics of digital practice so that new forms do not remain a “gray zone” lacking regulation.
5. Researchers should advance assessment methodologies: how to determine the artistic value of a digital or applied object created with AI; how to measure the sustainability of the digital creative process.

The analysis of academic works confirms that contemporary technologies fundamentally alter the creation of both digital and applied art – from methods and forms to the roles of the artist and designer. However, this transformation brings not only advantages but also responsibility – the technological revolution in art requires a sustainable and deliberate approach.

Accordingly, contemporary technologies radically reshape the landscape of both digital and applied art. Digital media, AI, and AR/VR enable the creation of new forms, expand the functions of art objects, and transform materials and modes of interaction. Yet opportunities come with challenges: authorship, sustainability, skills, and aesthetics. In applied art, digital tools open new possibilities for materials and production methods but require careful attention to functionality and context. In digital art, technologies become both medium and instrument of expression but require a reevaluation of the roles of the artist and the viewer.

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