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ABSTRACT
of the dissertation for the degree of Doctor of Science

PROBLEMS OF APPLICATION OF INFORMATION TECHNOLOGIES IN THE MODERN ARTISTIC PROCESS

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GENERAL CHARACTERISTICS OF THE WORK

Relevance and the degree of scientific development of the topic. Our world has become a unified environment of information society due to new information and communication technologies. The information culture of people engaged in the artist, composer, choreographer or other creative fields brings the use of information technologies to a completely new level in the modern artistic process. The information culture of a creative person means his ability to work purposefully with ICT in the artistic process, ability to benefit from new technologies, modern technical means and methods. This ability opens wide creative horizons and gives him freedom. This is adequately reflected in the development of the artistic process.

Art is the only area of modern culture that has entered the electronic age without any problem. In our opinion, this is due to the fact that art is informative. Any image is created in a certain informational context and loses its meaning outside it. In fact, the information space is the basis for any type of art. We can talk about the transmission of information content from one form to another, but it would be nonsense to exclude art from the information space, because it is the information space that gives meaning to any content.

Digital devices and means are becoming a kind of tool in the artistic process in the fields of artistic creation that use information and communication technologies in the modern world. Digital tools such as computers, various programs, algorithms and the Internet replace traditional tools such as brushes, canvases, musical instruments and palettes in the hands of creative people. All the above mentioned digital tools exist only in the digital environment, and the artworks created with their help are also displayed in the virtual world.

The lively association of art and modern information culture is due to the informational essence of art, the orientation of each work to one or another information product.

So, ICT, as an extremely powerful means of communication, has a strong influence on individuals and society as a whole, including the Internet coverage, obviousness, audiovisual figurativeness, interactivity of the information it provides. The Internet not only influences the cultural system, it becomes a subsystem that determines the form and content of cultural communications.

The use of different types of digital equipment, computer programs, applications, internet technologies, modern communication means and other IT tools during the artistic process, their influence on the creative process, as well as the presentation of the created artworks in the international electronic network were investigated in the presented dissertation, while studying the problems of applying information technologies in the modern artistic process. For this purpose, an attempt was made to analyze and interpret the influence of information technologies on the artistic process, the dependence of the artistic spheres on IT, and to show the problems and prospects of this process.

The use of information technologies during the artistic process helps to create artworks that meet a completely new artistic taste. The scientific analysis of the existing Art History literature on the study of this process shows that this problem is ***multidisciplinary*** in nature. The use of ICT in the contempopary artistic process is of interest to sociologists, philosophers and other scientists as well as art critics.

Therefore, comprehensive and complex study of the problem is possible by involving knowledge in informatics, technology, art, culturology, philosophy, psychology, sociology and other fields.

Scientists from different countries working in the humanitarian field are interested in the direct influence of IT on the life of a creative human and the artistic process in the modern world. However, today it is still too early to say that this problem has been fully studied. So, there is still no extensive

and scientific analysis of the impact and use of ICT in many fields of art, including architecture, fine arts, music, theater art, cinematography, television and media. There is a good reason for this effect. Since there is no scientific justification for the use of ICT in the artistic process in art, as well as its impact on the process, our research analyzed several forms of this impact simultaneously.

The study of the problems of the use of information technologies in art in modern world practice is one of the topical subjects of art studies. Scientists of the world's leading countries have studied the influence of information technologies on separate fields of art and their use in the artistic process, but the applying problems of information technologies in the general artistic process have not been systematically studied.

The use of IT during the artistic process is more accessible and unhindered in societies that have achieved scientific and technical development. Today, the study and serious research of the application problem of digital technologies in the artistic process, artistic creativity and art in general, is one of the most urgent topics, especially in scientifically and technically developed countries, where IT tools are directly produced. The field, in which we are engaged in research, is more and more active in research in contemporary Art History, various level conferences and science festivals are organized in this direction. The development of information technologies with ever-increasing dynamics and at the same time attempts to apply all this IT in the artistic process increase the relevance of the topic even more.

So, the relevance of the study is unquestionable.

It should be stated that there have been a small number of scientific articles and conference papers on the interaction, influence and existing problems of ICT and art in Azerbaijan, but no large-scale, systematic research work has been conducted. The absence of scientific literature and material in the Azerbaijani language in the mentioned field is clear evidence

of gaps in this field. This fact proves that there is a great need for serious scientific research, scientific material and scientific literature in the Azerbaijani language in this field. Taking all this into account, the study of application problems of IT in the artistic process is also of great relevance for our country.

On the other hand, the degree of scientific development of the influence problem of ICT on separate fields of art has different aspects and a wide range depending on the internal regularities of art types.

It should be noted that the problems of applying information technologies in various types of artistic creation have been studied to a certain extent by individual researchers. However, these studies are not in the form of complex studies, but do not cover the artistic process in general and have been carried out on the example of individual artistic fields. In this regard, when talking about the degree of development of the problem, we have analyzed the works of authors who have conducted research on the problems of applying information technologies in the artistic process in individual artistic fields. The problems of applying information technologies in music, cinematography, fine arts, theater and other artistic creation fields have been involved in research by musicologists, theater scholars, and culturologists, each in its own direction. The problems of applying information technologies in the artistic process have not been involved in a fundamental and comprehensive art history study.

Undoubtedly, these scientific studies have been invaluable to us in the formation of our dissertation work and in our research. In this regard, we can mention the names of Yerokhin.S.V, Girfanova.O.V, Bobraskaya, M.A, Astafyeva.T.V, Galkin.D.V, Annum.G.Y, Boden.M.A, Barry.K, Christina.P, D.Punjani and other researchers. The mentioned researchers have studied in their scientific works the features of the application of ICT in such artistic creative fields as music,

theater, fine arts, and the impact of ICT on the overall process in the artistic process.

In this direction, certain studies have been conducted from time to time in Azerbaijan, and there have been several valuable scientists who have dealt with the problems of the information society. In the mentioned direction, we can mention the names of R.Abdullaeva, A.Salamzade, I.Mammadzade, S.Mammadaliyeva, I.Israfilov, V.Gerayzade, T.Taghiyev, I.Karimov, A.Dadashov, F.Mustafayev, E.Jafarov and other scientists.

However, it should be noted once again that all these studies were conducted only on a specific field of artistic creativity. There are no single comprehensive studies.

Research object and subject

The research object is art in general. Despite study of the influence of different types of information technologies on the artistic process in art, the object of the research was art in general, including music, fine arts, theater, cinematography, television and multi-media, which are considered to be its leading branches. The technical indicators and parameters of various digital equipment, computer programs, applications and other multimedia technologies used in the art process have not been taken into account, the use of all these types of technologies in art has studied. The technical characteristics of all the technological means, ICT, digital devices and equipment, computer software and systems mentioned in the dissertation are not within scientific interest and were not involved in the research. The digital peculiarities of the information and communication technologies used in the art process, computing skills, coding and algorithm capabilities are not included in our scope of scientific interest. We deal with the application problems of all these mentioned technological tools directly in the artistic process, in art, in the spheres of artistic creativity.

The subject of the research is the use of information technologies in the artistic process in art, including music, fine

arts, decorative applied arts, theater, cinematography, television and multimedia.

The research subject is a scientific-theoretical review and aesthetic analysis of the peculiarities, regularities, as well as theoretical-practical foundations of the influence of new information communication technologies, the Internet and computer technology on different branches of art.

Research aim and objectives

The main goal of this dissertation is to systematically investigate the problems of applying information technologies in the artistic process in various fields of art, to reveal the characteristics and regularities of the application of various types of digital equipment, programs and Internet technologies, including artificial intelligence, in the artistic process, and to investigate their impact on the artistic process.

The following tasks have been identified in order to achieve the set goal;

- to predict the future results and prospects of their use in art, taking into account the daily, continuous development of new technologies;

- besides the general conceptual context of the research, it consists of studying the interaction of ICT and art in Azerbaijan;

- to investigate the ways to achieve dynamic development in the cultural sphere and fields of artistic creativity by applying IT in our country.

The main objective of the research is to study broadly and comprehensively the use of information technologies during the artistic process, including:

- determining the dependence of various fields of art on information technology

- studying the artistic process in art fields created by the use of information technologies

- studying the digitalization problem of art

- comparative analysis of traditional painting and digital painting laws

- determining the influence regularities of ICT on the dynamics of musicians' creative process

- studying the changes in cinema and television aesthetics and the development regularities of the art process in cinematography due to ICT

- separately study of contemporary digital technologies in cinematography

- investigating the application problems of ICT in theater art and other performing arts

- investigating the use and results of digital technologies in modern scenography in theater

- studying the interaction and interdependence of information technology and the artistic process in art

- studying the role of ICT in the management of art infrastructure in different artistic fields and preparing proposals

- building a probable scheme of the future development of the artistic process under the influence of information technologies in separate fields of art

- application problems of artificial intelligence systems in the artistic process

- active use and revealing of peculiarities of artificial intelligence in different art fields

- preparing proposals in the direction of optimizing the administration using IT in the cultural sphere in our country.

Research methods. The methodology of the presented research of Art History is completely and comprehensively determined by the main features of information technologies, which caused its proximity to humanitarian knowledge. Besides modern methods of Art History, methodological tools of other humanitarian sciences are also used in the research.

The theoretical basis of the research is the principles of historicity, systematicity and comparative analysis. At the same time, a comprehensive analysis of the interaction and

interdependence of information and communication technologies and the artistic process in art is taken as the theoretical and methodological basis of the research. Special attention was paid to the chronological sequence and the consideration of the development regularities of separate fields of art during the research, and the fundamental researches of a number of scientists and theorists of world Art History were referred to as a methodological basis for the illumination of the investigated problems.

The methodological basis of the dissertation is also works by information society theorists I. Masuda, A. Toffler, M. McLuhan, V. Benjamin and other scientists, as well as the works by R.Abdullayeva, A.Salamzadeh, I. Mammadzadeh, S. Mammadaliyeva, M. Alizadeh, V. Gerayzadeh, T. Taghiyev, I. Karimov, A. Dadashov, R. Aliguliyev, R. Aslanova, F. Mammadov, F. Mustafayev and other scientists who have dealt with the development problems of the information society in Azerbaijan. The works by many Western scientists, including J. Bodiyar, J. Deleuze, U. Eco, etc., as well as Russian scientists L.N. Gagarina, I.G. Yeliner, V.J. Kelle, A.M. Podshibyakin, K.E. Razlogov, E.G. Bagirov, O.V. Aronson, V.F. Poznin, A.V. Solovyov and others, who dealt with the problems of evaluating the place and role of information technologies in modern society, were also in focus during the work on the dissertation.

The main defended points

- Art is the only field of modern culture that has smoothly entered the electronic age. This is due to the information nature of art. Any image is created in a certain information context and loses its meaning outside it. In fact, the information space is the basis for any type of art. You can talk about the transfer of information content from one form to another, but it would be nonsense to exclude art from the information space, because it is the information space that gives meaning to any content.

- The analysis of the existing scientific literature of Art history shows that the application problems of information technologies in the modern art process are interdisciplinary, i.e. multidisciplinary in nature. A comprehensive and complex study of the problem is possible by involving data from informatics, technology, art, culturology, philosophy, literature, psychology, sociology and other fields. Scientists of the leading countries of the world have studied the influence of information technologies on separate fields of art and their use in the art process, but the application problems of information technologies in the general art process have not been systematically studied. Existing studies are not systematic in nature, they do not integrate different aspects of the problem fully.

- The influence of ICT on the dynamics of the creative process in music has created a number of new regularities: First, ICT has made distance music education and self-education possible. Secondly, thanks to the accessibility of the computer and the Internet, everyone can try himself as a composer, arranger, sound director, composer of new timbres and sound effects, and experience the joy of composing music. ICT and the Internet are a great world platform for budding musicians to promote themselves.

- The art of digital painting appeared with the help of use and influence of information technology. Samples of digital painting are preserved, exhibited, sold, etc. in a digital environment. Two opposite but parallel processes are taking place today: on the one hand, technologies create new fields of art, and on the other hand, new technological ideas and innovations emerge as a result of artistic experimentations. New technologies penetrate the world of art, and vice versa, art is gradually getting mixed up with the sphere of technologies. These tendencies stimulate the expansion of the diversity of artistic forms in art: *media art*, *digital art*, *net-art*, *high-tech* style, electronic music, computer graphics and animation, as well as digital archiving, multimedia catalogs are emerging.

- The use of ICT has created new means of expression necessary for scenography in the arsenal of theater workers. The use of information technologies in light and sound design and various details of scenography in the theater allows to stage performances that meet high artistic taste. The use of IT, including the phonogram in the theater is very advantageous from an economic point of view for theaters experiencing financial difficulties. The phonogram is the first and last musical link between the producer-director and the composer here: there is no need for orchestra rehearsals, score, conductor and recording studio.

- There are positive and negative effects of the Internet on art photography. The positive sides of this process are that the Internet provides an opportunity for photographers to show their work, communicate with colleagues from other countries, and for professionals to engage in online marketing. The negative sides of the process are that, on the one hand, as a result of low-quality photos on the Internet, the level of demand in this field decreases, the Internet photo gallery becomes cluttered, and on the other hand, the theft of photos from various professional blogs reduces the income of professional photographers.

- The specificity of the new technologies has revolutionized cinematography by creating non-linear editing and, as a result, possibilities for language, image and communication. The aesthetics of cinema have changed, new rules have emerged owing to ICT. *Firstly*, the structure of the frame has changed, where different frames and events are superimposed on each other, making the film multi-layered, making the film look like the Internet. *Second*, the use of collages and creating a mise-en-scene allowed the visualisation of details that changed in space and time.

- Artificial intelligence, the most modern technological tool, has already found its place in the artistic process to a certain extent. Artificial intelligence technologies are applied in

the artistic process in various types of artistic fields. Artificial intelligence systems are increasingly used in artistic fields such as cinematography, television, design, fine arts and music. The application of artificial intelligence in the film industry creates many new opportunities for creative collectives and film figures. Ideas that once seemed completely impossible and even fantastic become possible through artificial intelligence. Many new technologies are applied in the film industry, and these technological innovations elevate the film industry to a completely new artistic level. The most modern technological tools applied in the artistic process in the fields of cinema, advertising, and media design require a lot of money, but all the money spent is justified. Deep Fake technology, which is used with the application of artificial intelligence in the fields of television and digital media design, creates many new opportunities. Deep Fake allows actors with limited mobility and deceased actors to be seen on the screen again. Actors who are thousands of kilometers away from the filming sites and do not physically participate in the filming are seen in feature films, advertisements, and media products.

- Examples of the application of artificial intelligence and robotics in the artistic process are also quite extensive and are becoming more widespread over time. It should be noted that the application of robotics in various artistic creative directions is usually more widespread in countries that produce these robotics products. However, there are cases of the use of robotics products in the artistic process in other countries as well. Robotics products are successfully applied in many artistic creative directions such as music, choreography, theater, and installation. Of course, in these cases, along with creative artistic collectives, highly professional programmers and computer engineers are closely involved in the artistic process.

- During the global pandemic, internet technologies in various parts of the world created conditions for the uninterrupted activity and development of the artistic process.

The COVID-19 pandemic that swept the world in late 2019 led to the suspension of artistic events, festivals and sports competitions, exhibitions and other important artistic events for a certain period of time all over the world. It should be noted that these disruptions caused enormous material damage to the fields of artistic creativity, collectives and individuals in the international community. Internet resources came to the material and moral aid of humanity at a very difficult and painful time for the whole world. Internet technologies, resources and tools provided great support to the artistic process and fields of artistic creativity during the pandemic.

- Various types of digital tools, technological tools and devices play a major role in the preservation, restoration and reconstruction of examples of tangible cultural heritage. The most modern digital tools are an important technical tool in the preservation of historical architectural monuments, religious complexes and museums, libraries and other monuments. Examples of tangible culture damaged by various natural and emergency events, wars and conflicts, terrorism and vandalism are restored and reconstructed using digital tools and devices.

The use of digital technologies turns any object into an element of the frame, combines symbols, letters, sounds, interior, numbers into a single body and visualizes them according to a certain semantic load.

The process of active interaction of modern cinema, television, video and multimedia in various settings is underway due to ICT. The widespread use of ICT will lead to the further development of the aesthetics of image media, the convergence of cinema and video systems, and the integration of all communication and information processes in the near future.

Scientific novelty of the research is that for the first time the application problems of information technology in the art process are studied in detail and extensively. The dissertation studies the art process as a whole, not some art fields separately. An attempt is made to comprehensively study the influence of

information technologies on the art process and the theoretical and practical aspects of the dependence of the artistic process on new technologies, including justify the relevance of the problem. One of the main goals is to engage the role and influence of ICT in each of the abovementioned creative art fields, along with the application problems of information technologies in different art fields in the research.

Besides all the above, studying the role of ICT in the management of art infrastructure, in various fields of art during research and making proposals are also scientific innovations.

In general, the use of information technologies in the modern art process from the point of view of Art history has not been practically studied in detail and comprehensively until today. An attempt was made to find answers to many other questions besides the use of information technologies in the art process during the research. For example, the use of artificial intelligence systems in art, which is the focus of the world's attention and is one of the latest innovations of information technology, was also involved in a separate study for the first time. It should be taken into account that the rapid development of modern information and communication technologies makes the set goal extremely difficult. It is especially difficult to make predictions about the future.

It has been shown that computer communications create new opportunities for increasing the creative activity of the artist in the art process. Computer technology and ICT influence somehow all areas of human life and activity directly or indirectly now. The main thing is that ICT influences the consciousness of creative people and thereby the development dynamics of the art process, art as a whole.

Besides the general conceptual context of the research, the interrelation and interaction of ICT and art is studied for the first time in Azerbaijan.

The theoretical and practical significance of the research is that, for the first time, the opportunities created by ICT in art have been comprehensively investigated.

Our research has proven that art and technology penetrate mutually each other, and as a result, *high-tech* style is created. The fusion of art and technology gives rise to new "synthetic" areas of creativity, gives impetus to the creation of "synthetic art".

The results of the research have already been applied and give significant results:

Extensive project on "Identification and research of existing portraits of Shah Ismail" was developed under the grant project of the Azerbaijan Science Foundation on the topic of the dissertation in 2018. Research work was carried out in funds, archives, libraries and museums in Florence and Mantua, Italy during the project.

Research has been carried out, relations have been maintained regularly and scientific consultations have been held in the framework of an international project with Italian scientists since 2019. Elshad Aliyev participated in the joint project with the official invitation of the Italian Ministry of Culture and the Uffizi Gallery, and as a result, a voluminous collective monograph called "La collezione Gioviana degli Uffizi" (Florence, Italy, 2023) was published. He is the author of two texts in the collective monograph.

Approval and implementation. The absence of scientific literature in the Azerbaijani language in the scientific problem, which is involved in the research, causes certain gaps in the education process. Taking into account the abovementioned problem, the result of the dissertation can be used in the teaching process in the fields of science such as culture and art, art history, culturology in the future. The publication of separate chapters of the dissertation as a monograph or textbook can be used as a training aids in Azerbaijan State University of Culture and Art, Azerbaijan State

Academy of Art, Azerbaijan University of Architecture and Construction, and other higher education institutions on the profile, and will help the education process.

Approbation of the research. The main points of the dissertation were presented for discussion at international and national scientific conferences of various levels, published in scientific articles and in monographs in Azerbaijan and abroad.

Monographs. The main points of the dissertation were presented to the scientific community in the following monographs:

- "Internet technologies and art", Baku, AFPoliqrAF Publishing house, 2018, 170 p.

- "Iconography of Shah Ismail Safavid in European fine arts", Baku, 2020,144 p.

- "Creative artistic potential of artificial intelligence", Baku, "Avropa" Publishing house, 2021, 126 p.

Use of research.

- Extensive project on "Identification and research of existing portraits of Shah Ismail" was developed under the grant project of the Azerbaijan Science Foundation on the topic of the dissertation in 2018-2019. Research work was carried out in funds, archives, libraries and museums in Florence and Mantua, Italy during the project. https://www.aef.gov.az/upload/Files/eif-elm-tehsil-1-2016-126/hesabat/23-yekun_hesabat_eliyev_elsad.pdf

- On the topic of the dissertation, research was conducted together with Italian scientists within the framework of an international project. A voluminous collective monograph (800 p.) entitled "La collezione Gioviana degli Uffizi" (Florence, Italy, 2023) was published as a result of these studies, conducted jointly with the Italian Ministry of Culture and the Uffizi Gallery in 2019-2023 (ISBN: 8809893549). https://giunti.it/products/la-collezione-gioviana-degli-uffizi-cofanetto-

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The name of the institution where the dissertation work was performed. The presented dissertation work was performed in the Department of "Culturology and Theory of Art" of the Institute of Architecture and Art of the Azerbaijan National Academy of Sciences.

The total length of the dissertation with a character indicating the length of the structural sections of the dissertation separately. Dissertation consists of Introduction, 5 chapters, 18 paragraphs, Conclusion, a list of references used in 309 titles. The total length of dissertation: Introduction – 19 pages (37812 characters), Chapter I – 21 pages (38063 characters), Chapter II – 77 pages (155978 characters), Chapter III – 36 pages (71623 characters), Chapter IV – 40 pages (81558 characters), V chapter – 25 pages (53798 characters), Conclusion – 15 pages (32652 characters). The total length of the work (excluding the list of references) consists of 235 pages, 471484 characters. The total length of the dissertation is 260 pages.

THE MAIN CONTENT OF THE DISSERTATION

The relevance of the topic, the object and subject of the dissertation, methodological bases, aims and objectives, the degree of study of the problem, the scientific novelty of the research, the theoretical and practical significance are determined, its approval and structure are discussed in the **introduction** part of the dissertation.

The first chapter of the dissertation is entitled **"Dependence of different art forms on ICT and the emergence of new art forms under the influence of ICT"**. This chapter consists of 4 paragraphs and 3 sections.

It is stated in **the first paragraph** called **"Art and ICT"**[1] that technological tools become art tools due to the influence of scientific and technical progress and the demand of creative people. Completely new fields of art, which exist entirely on the digital platform, are created and new media-artists are growing through the use of technological innovations.

Cinematography is one of the art fields completely dependent on modern information technologies. The art process in cinematography is completely dependent on IT, it is impossible to imagine the film industry without various digital equipment, devices, computers or modern film cameras. Modern technologies such as *motion capture*, three-dimensional graphic arrangement and cloud technology make cinema more interesting, more attractive and more expensive every year. These types of technological innovations create conditions for the realization of fantastic ideas in cinematography and the emergence of unreal, incredible images. Media tools, devices and equipment are actively involved in the art process in several art fields, as in cinematography, and play an indispensable role in the creation of a work of art. That is, contemporary media arts and artists are absolutely dependent on certain electronic,

[1] Əliyev E.V. Yeni sənət növləri və informasiya texnologiyaları. // - Bakı: Sənət Akademiyası, - 2019, №2 (7), - s.101-105

digital, media tools and equipment. In this regard, we demonstrate the dependence of art fields on ICT for the first time[2].

The concept of "Digital painting" was studied in **the second paragraph** of the first chapter called **"Emergence of new art types under the influence of ICT"**.

New kinds of fields such as digital music and digital painting have emerged under the influence and direct involvement of modern ICT.

One of the art fields that exists absolutely on the digital platform is "Digital Painting", which has developed significantly in recent years. Digital painting is created by a human on a computer using imitations of traditional artist's tools. Digital painting is an art form created entirely on a digital platform from the beginning to the end, without the use of brushes, canvas, paint, etc.

It is glad that Azerbaijani artists have been creating art works in various styles using media technologies today. Such media artists include researcher and educator Orkhan Mammadov and professional graphic artist Rasul Hasanov.

Another field of art that has emerged under the influence of information technology is "Electronic" or "Digital" music. The term electronic music originated at the end of the 20th century and was later replaced by the term "digital music" due to the emergence and use of digital equipment and computer programs. Unlike computer graphics, electronic music has a much longer history. The point is that it was a long-standing desire of musicians to preserve the performed music.

The third paragraph, called **"Artistic process in digital painting"[3]**, deals with defining the characteristics of the

[2] Aliyev E.V. The Application Problem of Internet and Multimedia Technologies in Modern Theatre in Azerbaijan. // Journal of Arts. 2021, 4(2), - pp.59-65. DOI:10.31566/arts.4.2.01

[3] Алиев Э.В. Художественный процесс в цифровой живописи. // Электронное периодическое рецензируемое научное издание

art process in digital painting and the artistic product resulting from this process. A retrospective analysis of the problem shows that although many scientific works and studies are devoted to the description and interpretation of the art process in digital painting, there is no unanimous opinion on the characteristics of artistic thinking in the process of creating an artistic product. Our research shows that the development of ICT and computer technologies has contributed to the increase of the technological efficiency of art, the growth of art and artistic thinking, which in turn stimulates the aesthetics of new technologies, especially Internet technologies.

We compared the main peculiarities of the creative process visually in digital and non-digital fine arts using a Venn diagram **in the fourth paragraph,** entitled **"Comparison of the creative process and the main peculiarities of the art product in digital and non-digital painting"**. The comparison shows that while the artistic product is a material object in traditional painting, it has become a virtual product through digital technologies.

The second chapter of the dissertation, called **"Problems of use of ICT, internet and multimedia technologies in music, performing arts and cinematography"**, consists of 7 paragraphs.

The regularities of the influence of ICT on the dynamics of the creative process of musicians are revealed in **the first paragraph** of the second chapter called **"The influence of new technologies on the development dynamics of the art process in the art of music"[4]**, and the future development directions of musical information technologies are predicted.

«Художественная культура». №2. 2021. Стр. 406-420. [Elektron resurs]. URL: https://cyberleninka.ru/article/n/hudozhestvennyy-protsess-v-tsifrovoy-zhivopisi

[4] Əliyev E.V. Yeni sənət növləri və informasiya texnologiyaları. // - Bakı: Sənət Akademiyası, 2019, №2 (7), s.101-105

The first pattern is distance music education and self-education using the possibilities of this ICT. First of all, we need to mention the fact that music history and theory is already available even in the most remote corners of the world's educational institutions. This means that more people interested in music will acquire scientific and practical knowledge in this field.

The second pattern is the availability of computers and the Internet, which provide excellent opportunities for music work. Everyone can try himself as a composer, arranger, sound director, composer of new timbres and sound effects.

The third pattern is that information technology facilitates the labor-intensive musical professions. Musical computers and the Internet give them the joy of composing music instantly. Truly talented musicians become skillful performers.

The fourth pattern: ICT and the Internet are a great platform for budding musicians. So, anyone can compose their own music and post it on the Internet, get the opportunity to listen to it in every part of the world and find out what their listeners think about it. By taking into account the opinions of different listeners, he can give finishing touches to his work.

Today, there are quite famous performers in our country and in the world, who have made their first steps on social media. Social media and the Internet provide incredible opportunities for young performers. The media environment offers an endless virtual concert hall for young performers who are not known and have no audience.

As a result of the successful use of information technologies, digital tools and equipment and computer programs, new music numbers and albums of deceased performers and musicians can be released.

It is shown in the paragraph of the second chapter, called **"Theatre and new technologies"**[5], that new means of expression based on the use of ICT and important for scenography have appeared in the arsenal of theater workers in the last decades. The use of information technologies in light and sound arrangement, various details of scenography in the theater allows to build spectacles that meet high artistic taste. The use of IT, including the phonogram in the theater can be considered very effective. This is very beneficial from an economic point of view for theaters with financial difficulties. The phonogram is the first and last musical link between the producer-director and the composer here: there is no need for orchestra rehearsals, score, conductor and recording studio.

It is shown based on the analysis of a large number of examples in **the second paragraph** of the second chapter, called **"Choreography"**, that like other performing arts, the art of choreography uses modern information and communication technologies widely. Many modern technologies, such as "video mapping" technology, which is already considered simple, *Motion Capture* and *Virtual Reality* technologies, used in cinematography, are used in the art of dance.

It is stated in **the third paragraph** of the second chapter called **"Circus art"** that modern information and communication technologies are also used in the arrangement of circus performances today. Recently, there are various international institutions, organizations and individuals who oppose the use of animals in circuses. Some circus collectives have already refused animal-based performances. The famous German circus collective "Circus Roncalli" presented performances with hologram images of animals.

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[5] Aliyev E.V. The Application Problem of Internet and Multimedia Technologies in Modern Theatre in Azerbaijan. // Journal of Arts (Türkiye), 2021, v.4, № 2, pp. 59-65. [Elektron resurs]. URL: https://journals.gen.tr/index.php/arts/article/view/1271https://doi.org/10.31566/arts.4.2.01

It is proudly stated in **the fourth paragraph** of the second chapter, called **"Azerbaijani theater art and innovative technologies"** that a number of media technologies used in theater art and scenography in the modern world are being successfully used in Azerbaijan today. The technology known as *"Projection mapping"* or *"Video mapping"* should be mentioned among them. Currently, several performances prepared with the help of this technology are performed on the stage of the Academic National Drama Theater, the flagship of the Azerbaijani theater. Experience shows that the use of new media technologies in theaters gives higher results when accompanied by technical staff and professional IT engineers. The creation of new performances with the use of IT in the theater and the creation of performances that can meet high-level artistic taste are achieved precisely as a result of joint work with IT specialists. The use of "video mapping" technology does not require a large amount of financial resources, but such performances are distinguished by their artistic aesthetic appeal, attracting the modern spectators to the theater. This technology allows any image to be transmitted to the stage through projectors. To get a more beautiful and spectacular result, different images are transmitted from several projectors at the same time.

Creative people working in theater must work together with IT specialists to use *video mapping* technology more effectively and successfully.

Our research in the section of the second chapter called **"Use of ICT to financially engage theaters"** shows that no big theater operates without sponsors. The most famous and "richest" theaters, from the world-famous "La Scala" Theater to Moscow's "Bolshoi Theater", also work with sponsors and donors. It is possible to achieve more ticket sales by involving Internet tools in the theater. Besides this, placing advertisements and various types of information on the international electronic network will keep the theater always "in sight".

It is stated in **the sixth paragraph** of the second chapter called **"ICT in the art process in the art of cinematography"**[6] that the art process in cinematography depends on IT from beginning to end, it is impossible to imagine the film industry without various digital equipment, devices, supercomputers or modern film cameras. The aesthetics of cinema have changed, new rules have emerged due to ICT.

First, the structure of the sequence has changed, where it is possible to use different frames. Events are superimposed on each other at the same time in the film, which makes the film multi-layered.

It is possible to bring actors who have lost their mobility and passed away back to the movies through modern digital technologies. Deceased actors have already been revived in several films and advertisements using computer generation and DeepFake technology.

Secondly, one of the important patterns is the use of collages[7] and the creation of mise-en-scene[8]. It is possible to superimpose images due to computer graphics. Using collages and frames allows to visualize parts that vary in space and time.

Thirdly, the use of digital technologies turns any object into an element of the frame, combines symbols, letters, sounds, interior, numbers into a single body and visualizes them according to a certain semantic load.

Information and communication technologies have raised the art of cinematography to a completely new stage of development. The film industry is developing dynamically through modern digital technologies such as Motion capture,

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[6] Aliyev E.V. The impact of the Motion Capture technology on artistic process in film art. // Journal of European Art, 2015, № 2, pp.10-12

[7] collage is a technique in fine arts. It is the gluing of certain materials that differ from it in color and texture on any base

[8] mise-en-scene is a theatrical term. It is the placement of the actors on the stage at a certain moment of the performance, considering each other and the properties surrounding them

Cloud, DeepFake, 3D, and ideas that once seemed incredible find their way on white screens.

Creative people working in the film industry manage to realize fantastic ideas with the help of modern digital means and tools.

Finally, we should state that the process of active interaction of cinema, television, video and multimedia on various parameters is underway due to ICT.

It is stated in **the seventh paragraph** of the second chapter called **"Use of ICT in installation art"** that installation (eng. – *structure, placement, montage*) art is a form of modern art, which is created with ready-made materials, forms and products, related to space and environment. Various natural objects, industrial and household items, text and other visual information fragments can be used in the installation. The installation is usually closely related to the environment and space, "loaded" by conveying a specific social message.

Installation art has not been involved in detailed research of Art history. We study the features and problems of the use of digital devices and tools, computer programs and in general, information technologies in the construction of the installation in this paragraph of the dissertation.

Today, there is a particular interest in installation art in various countries around the world. Artists such as Karsten Höller, Judy Chicago, Doris Salcedo, Allan Kaprow, Kurt Schwitters, Yayoi Kusama, Olafur Eliasson, Jason Rhodes, Shiaru Shiota, who are engaged in installation projects at different times, can be mentioned.

Names of YARAT contemporary creative space, Azerbaijan Carpet Museum and other cultural institutions, workshops and galleries, which are remembered for innovative steps in the field of installation in Azerbaijan, can be mentioned. It is worth mentioning the name of Chingiz Babayev among the artists working with installation projects. The artist's creative practice combines painting, graphics, sculpture, collage, street

art, installation, performance, video art and other different media, exploring the possibilities of realizing different ideas.

Chapter III of the dissertation, called **"National cultural heritage and new technologies"**, consists of two paragraphs.

The first paragraph, called **"Use of ICT in the preservation of samples of national cultural heritage"**, emphasizes that the preservation, study and promotion of cultural heritage becomes a means of developing the cultural and national identity of the nation and the state, as well as the cultural unity. This becomes especially relevant against the background of large-scale globalization, ethnic assimilation, loss of languages and national minorities. The popularization of knowledge, cultural memory and information about cultural heritage can contribute to the preservation of national (ethnic) cultures, the preservation of cultural diversity and after all, the preservation of the humanistic foundations of human civilization.

Unfortunately, the occupation of our territories for many years led to the destruction, looting and total loss of our material cultural heritage. We witnessed destruction and vandalism in our lands that were liberated from occupation as a result of the counter-offensive operations in the fall of 2020. The destruction of museums and libraries, cultural houses, home museums, historical and religious monuments and other important buildings with special cruelty, the total and eternal loss of many samples of our cultural heritage was an attempt to inflict a heavy blow on the national identity of our people and our historical memory. It is with the help of modern digital tools that we need to prepare a digital model of our existing samples of historical heritage.

Information and virtual reality technologies create a unique opportunity to learn as much as possible about this important aspect of every human life.

It is emphasized in **the second paragraph** called **"Use of ICT in the promotion of national cultural heritage and art samples"** that according to international experience and examples, it is possible to implement many projects in the preservation, restoration and reconstruction process of cultural heritage with the help of modern digital equipment and devices in our country.

Major and minor conflicts occur in different regions of the world at different times and monuments, complexes, religious and historical buildings that can be considered universal cultural heritage are seriously damaged in such conflicts, and they are completely destroyed from time to time. From this point of view, we should not forget the acts of cultural terrorism committed against the national cultural heritage of our people since the end of the last century, destroyed museums, razed mosques and our cities turned into ruins. According to the international experience and examples we mentioned during the research, it is possible to implement many projects in the preservation, restoration and reconstruction process of cultural heritage with the help of modern digital equipment and devices. The help of artificial intelligence and robots can also be used in this field. As we mentioned above, robots equipped with artificial intelligence are already used in the protection of samples of material cultural heritage in different parts of the world. It is also very important to build three-dimensional digital models of historical, religious and cultural monuments in different parts of our country, which are in danger of being destroyed due to different reasons, using modern devices. Such digital models will be of great help in various restoration and reconstruction projects in the future. Already lost, completely destroyed monuments, complexes and other samples can be restored and reconstructed on the basis of photos and video images taken then. These models can be an invaluable means in the restoration and reconstruction of monuments in the future. Fine art samples, miniatures, ancient books and manuscripts and

documents can also be digitized with the help of modern digital equipment. All possible means of the newest information and communication technologies, camera, still camera, scanner, computer programs, Internet resources and other means should be used as widely as possible in the preservation of cultural heritage.

Chapter IV of the dissertation, called **"Artistic creative potential of artificial intelligence"**[9], consists of two paragraphs.

An attempt was made to find the root of the problems of the participation of artificial intelligence systems, robotic and automated systems in the process of artistic creation, and the potential of artistic creativity, based on several examples and samples in **the first paragraph**, called **"The concept of artificial intelligence and the evolution of robot engineering"**.

As mentioned above, the development of high technologies at an incredible speed makes it difficult for us to make any accurate predictions about the future.

Artificial intelligence is already used in almost all areas of human activity. Artificial intelligence systems are already being used in the fields of heavy industry, machine building, agriculture and light industry, medicine and even tourism.

Artificial intelligence systems also attract the attention of creative people, and these systems are already successfully used in many projects.

Artificial intelligence is usually associated with robots. Various types of robots in heavy industry are already being used in the arts. However, we can say definitely that robots are losing to humans in this field for now and hopefully, they will lose in the future as well. Various types of digital equipment, computer programs, algorithm and coding are tools in the hands of smart

[9] Əliyev E.V. Süni zəkanın bədii yaradıcılıq potensialı. "Avropa" nəşriyyatı. Bakı. 2021. 126s. ISBN:978-9952-37-570-1

person. So, our final conclusion is that art is a field that robots cannot engage. Artificial intelligence systems cannot have independent creative abilities, they are just tools for humans. We hope this will always be the case.

The second paragraph, called **"Creative potential of artificial intelligence"**[10] states that modern digital technologies, artificial intelligence systems make it very difficult to see the difference between real and fake media. Using DeepFake, which is based on artificial intelligence systems, it is possible to create a fake videoimage that does not reflect reality by placing any visual image on top of another videoimage. The goal is to create media images based on digital analysis and digital arrangement that create truly timeless, hyperreal video images. With the help of artificial intelligence, it is possible to revive an actor or a famous figure in any video or film, who has no motor activity or who already lost his life.

In particular, it should be stated that the use of the abovementioned technology has led to the emergence of many illegal videos and fake images in the world, and in turn, this type of technology has led to a large number of dissatisfactions. Technology has increased the number of unreal videos of people, especially indecent (erotic) video images. These cases caused legitimate trouble of more actors and actresses and famous figures. At the same time, technology can lead to the sharing of false information and the showing of actions that do not reflect the truth without the permission of political figures, heads of state and public figures. There may appear unusual images of various public figures, politicians and heads of state

[10] Aliyev E.V. Risk Assessment of Using Artificial Intelligence Systems in Creative Human Activities. // "Reliability: Theory and Applications" (SCOPUS journal, USA). RT&A, Special Issue No 5 (75) Volume 18, pp.238-250. November 2023. [Elektron resurs]. URL: https://doi.org/10.29013/EJA-23-1-33-37 https://www.gnedenko.net/Journal/2023/SI_052023/RTA_SI_5_2023-23_238-250.pdf

that do not reflect reality, which will lead to dangerous consequences.

We would like to mention one example of use of artificial intelligence in cinematography and television. One of the new technologies built on artificial intelligence systems is Deep Fake technology. The term means “deep lie” in direct translation. The technology ensures that any image can be adapted to a moving video image.

In 2021, the Turkish media and TV channels started broadcasting a Ziraat Bank commercial featuring actor Kamal Sunal, who died in 2000. The commercial was shot with the participation of actor Mehmet Kurt, and the facial features of late actor K. Sunal were revived on M. Kurt’s face through Deep Fake technology. The commercial roused quite a lot of interest, but also divided the viewers into two parts, experiencing two completely opposite feelings. Some of the viewers are very happy to see their favorite actors on the screen again after many years, while some of them said that the completely new image of the deceased person had an unusual effect on them. Hence, it follows that the authors and creators of the commercial achieved the desired effect.

So, actors with limited mobility and even deceased actors can revive in films and other media images with the help of artificial intelligence systems. This in itself gives the directors new fantastic ideas.

Chapter V of the dissertation is called **“Use of information technologies in various creative directions”** and consists of three paragraphs.

The first paragraph of this chapter is called **“Digital Humanities”** and it is stated in the paragraph that “Digital Humanities” is one of the multidisciplinary fields that is developing rapidly and dynamically. “Digital Humanities” studies the possibilities of possible application and use of new digital and information-communication technologies in

humanities and education, incorporating the methodologies and practices of humanities, social and computational sciences.

Today, "digital humanities" are attracting more and more interest all over the world. Digital skills open up opportunities for research in the humanities in various developed countries. When we talk about digital humanities, our main goal is to explore the use of digital technologies in Art history.

As an example of the use of information technologies and internet resources in modern Art history, results of the applicant's creative relations with scientific institutions, museums and foundations of Europe, especially Italy from 2018 are analyzed in **the second paragraph** of chapter V called **"Use of information technologies and Internet resources in research of Art history: Personal experience".** While taking an art course in Florence, Italy back in 2002, the applicant saw the portrait of Shah Ismail I in the Uffizi Gallery, established relations with the gallery's staff, obtained certain information, later visited several cities in Italy several time (2004, 2011, 2019), conducted research in libraries and museums, and as a result of all these works, he won the "Science Education Integration" competition of the Science Foundation under the President of the Republic of Azerbaijan with the project "Identification and study of existing portraits of Shah Ismail" in 2018. Besides the identification and research of the existing portraits of Shah Ismail I, images of Shah Ismail I in European fine arts, which are unknown to Azerbaijani Art history, were identified and new paintings depicting Safavid-Qizilbash costumes and images were revealed within the framework of the project. Relations were established with the staff of the Uffizi Gallery in Florence, the Royal Palace of Mantova, the University of Verona and the Burgher Castle Museum in France through Internet resources during the work on the project, valuable information important for research was obtained, and the basis for future cooperation was created. All these

opportunities were made possible by the use of internet resources, digital scientific bases and digital libraries.

We have obtained important achievements in the field of use of ICT in our personal experience. We have participated in the joint project of the Italian Ministry of Culture and the Uffizi Gallery since 2020. As a result of the project, a large collective monograph of 800 pages entitled "La Collezione Gioviana degli Uffizi" was published. Elshad Aliyev is the author of two texts in the monograph.

The abovementioned project is an obvious example of the help of ICT means and especially internet tools in research of Art history.

The last paragraph of chapter V of the dissertation is called **"Art process and ICT during the pandemic"** and it is shown that one of the industries most affacted by the global pandemic was the tourism industry. The tourism industry is directly related to the field of culture, and this collapse had a negative impact on cultural tourism. Cultural events, concerts and exhibitions were canceled almost everywhere in the world.

Of course, people could not be allowed to stay away from concerts, plays, exhibitions and other cultural events during an unexpected natural event.

ICT has become a wonderful and effective tool to provide people's cultural recreation with high artistic taste and to ensure continuous participation of creative people in the art process. By using new media technologies, social networks and internet resources, museums, theaters, galleries and creative people in general were able to present the art products they produced and preserved to their listeners and viewers. So, it is safe to say that modern ICT has helped people, especially creative people to get through the current pandemic period more comfortably and with less loss. Art works created as a result of the widespread use of ICT by cultural and art figures and institutions were successfully presented to viewers, listeners and

fans, preventing people from staying away from active cultural life, even if they did not replace real communication.

Conclusion. It is stated in the introduction that ICT is developing with increasing dynamics. It is extremely difficult to make any predictions about the future of ICT means, which are developing at a great speed. However, it is fair to say that information and communication technologies are increasingly involved and interfering in human life. It seems impossible to imagine our life without modern technologies. As a result of the development and accessibility of modern digital technologies, modern information technologies are used even in the poorest regions of the world. Modern information and communication technologies have already become an important form of demand rather than an entertainment function. Agriculture, agro-industry, cattle-breeding, management, tourism and other fields are no longer able to continue their activities at a normal level without the use of modern ICT means. As a result of the professional use of modern ICT tools, once waterless deserts are now turning into oases.

Of course, the dynamic development of information technologies also influences on the modern art process. The detailed analysis of scientific literature and samples of art, which we have involved in the research, allows to think about the wider use of ICT in the modern art process day by day. Technological factors and scientific-technical progress that influence directly on the contemporary art process are manifested more or less in various fields of art.

As we have already mentioned above, completely new fields of art have emerged and developed rapidly due to the influence of technological factors. At the same time, some art fields became directly dependent on modern technologies. Besides art fields that function without dependence on the most modern digital equipment, internet platforms and other information technologies, there are also art fields that cannot function without such technological factors.

Besides the development of scientific progress and its influence on the art process, art fields also have some influence on various technical factors. Scientific and technological progress also becomes artistic and more aesthetic through the demand and influence of artists and the art process. So, art becomes technological, and technologies become artistic and aesthetic.

The emergence of new art forms under the influence of ICT

Our research on Internet resources shows that all art fields intersect with Internet technologies in one way or another. Even creative people who do not use information technologies, media tools, devices and equipment during the art process place the art sample on Internet resources and present it to a wide audience. This fact proves that the Internet is a platform where all art fields gather and cross paths. Technological innovations find new forms and improve due to the demand and influence of art fields. Different types of technologies are used in many fields of art to realize the desires of artists. As time goes by, art is becoming more and more technological.

Music

Currently, new opportunities of ICT are revealed almost every day and so, new aspects of its use in the modern art process also emerge. Therefore, it is no coincidence that scientists who have analyzed the influence of ICT on music in different periods point out different aspects of this influence. Scientific articles published on this topic become outdated and lose their relevance in a short time. Therefore, it is natural that the study on the influence of ICT on the development dynamics of the art process and the obtained results may completely fail after one or two years. Despite this, we have conducted research on the basis of rich material of art history and predicted how ICT will influence on the art process in the future.

Our research on the use of information technologies in the modern art process in the art of music shows that the art of

music creates more opportunities for the use of information technologies. All the abovementioned equipment and devices are an obvious sign of the great interest and attention of people engaged in the art of music to modern innovations and new technologies. Musicians add special interest to the art process, achieve new, interesting results and continue their creativity successfully by using modern technologies in the creative process. Information technology has a wide scope, from recording music samples to composing music in various computer programs. However, such a field as digital music has emerged and gained great popularity due to the influence of high technologies.

Of course, Internet resources and social networks have a very important place in terms of promoting of music art and delivering it to a wide audience. Recently, young performers in different parts of the world have become popular first of all on social networks and Internet resources, and after that they are invited to television and radio. Internet resources and especially, social networks serve as an invaluable starting point for musicians and performers who take their first steps in the initial stages of their work to reach a wide audience. It should be emphasized that becoming popular on social platforms in the early stages of their work helps young performers to avoid additional financial expenses. The accessibility of social networks and other internet platforms and the fact that even the part of the population belonging to the materially lower social group has access to the internet provides additional support to performers and musicians in this work. Various performers and musicians in our country also use Internet resources and the tools provided by technology a lot. Young performers using internet platforms and various social networks can quickly become popular among the population.

Theater and other performing arts

So, summing up all our considerations about theater art, we can come to the conclusion that modern theater art and

scenography are largely dependent on ICT. At the same time, the use of new types of media technologies in the theater is evaluated positively and gives many positive results.

It is possible to get a serious financial flow to theaters by using modern ICT tools at a professional level and managing theater enterprises at a high level. There are different ways to attract funding to the theater. We believe that these tools can be successfully used in Azerbaijani theaters as well. It is also possible to create a council of sponsors of theaters operating in the country. But in any case, the main task of all theaters is to produce a quality "product". By presenting a quality performance, the theater can attract the attention of sponsors and patrons, and in this case, the sponsors will be interested in showing their logo on the poster of the theater. It should be stated once again that the theater must first bring itself to the "brand" level for all this.

Theater workers can achieve higher artistic design due to the successful use of information technologies in the modern theater. Using modern means, it is possible to provide the flow of a wide audience to the performances created by the theater. For this purpose, the wide use of Internet resources has become a requirement of modern times. Studies prove that modern media technologies and Internet technologies help theaters to attract audiences and finances. In order to use these tools successfully, it is necessary to attract media technologies and marketing professionals to theaters.

The professional use of modern ICT in theater art creates many new opportunities for the creative staff working in theaters. However, theater workers are required to work hand in hand with specialists of information technology in this process. This cooperation can cover a wide range of fields, from script writing to scenography design, from management of theater enterprises and administrative buildings to financial attraction to theaters.

Achieving special effects by directors that were once impossible on the stage of the theater, the use of technologies that can only be used in the field of cinematography in scenography, the natural ways of achieving them inside the theater buildings, the impossible effects finding their place in the theater structure can be achieved with the use of modern digital technologies and the involvement of professional IT specialists.

So, the use of ICT in the modern art process in the field of theater has several main results:

1. Theater workers should be more closely and seriously engaged with modern ICT tools.

2. IT specialists and theater workers should work together using ICT tools in the field of theater.

3. The use of modern information and communication tools supports the emergence of new staging that can meet high artistic taste in theaters.

4. It is possible to obtain special sound and visual effects, which were once impossible in the theater, with ICT tools.

5. ICT tools can provide important support in managing the administrative building of the theater and attracting additional financial income to the theaters.

Cinematography

The art of cinematography has always been a field that leans more towards new technologies. Cinematography is an art that is completely dependent on technologies in general. That is, the art product created by this art cannot exist without certain technological tools, digital equipment and devices. The film industry, in general, cannot operate without ICT equipment and devices. The art process in cinematography depends on IT from beginning to end, it is impossible to imagine the film industry without various digital equipment, devices, powerful computers or modern film cameras. It should be taken into account that the film industry is not only an art process, a creative concept, but also a big business. Soviet theater and film director, screenwriter

Andrei Tarkovsky claimed that “Cinema is a miserable art because it depends on money and is sold like cigarettes”. Completing the genius director’s opinion, it should be stated that the film industry requires serious funding because it depends on the most modern ICT tools. The use of the latest technologies in the film industry requires a large amount of financial resources. However, it should not be forgotten that in most cases, the financial resources spent on the film industry eventually return to the producers many times over.

Currently, many modern technologies are used in the field of cinematography. Modern technologies such as *motion capture*, three-dimensional graphics and *cloud technology* make filmmaking more and more interesting, more attractive and more expensive. These types of technological innovations create conditions for the realization of fantastic ideas in cinematography and the emergence of unreal, incredible images. Modern digital equipment and technologies help to realize the ideas of people working in the film industry, to find high artistic solutions and to give good feelings to the audience. Today, the technical means, media technologies, systems and programs produced by the possibilities of modern technical progress are widely used in film production and cinematography in general, and have a significant impact on the development dynamics of the art process.

The development dynamics of ICT has actively influenced the film industry. Scenarios that once sounded completely unbelievable have found their way to blue screens with the development of information technology. Directors who could not realize their existing ideas at the time were able to present unrealistic movies to the audience by using IT.

Examining the use of ICT in the film industry, we obtain some general conclusions:

1. In general, the film industry and cinematography are completely dependent on modern ICT.

2. Today, technologies such as Motion capture, 3D, Deep Fake, Cloud applied in the art of cinema bring cinematography to a completely new level.

3. ICT tools used in the film industry are quite expensive, but properly and professionally used technologies justify ultimately all the financial resources spent.

4. Creative collectives and groups located thousands of kilometers away from each other can participate in the same project. The use of modern digital technologies shortens the physical distance between creative collectives and eliminates it completely in many cases. Cloud technology creates fertile virtual space by eliminating physical distance.

5. Ideas that once seemed impossible and unrealistic to realize have given way to blue screens with the use of information technology.

6. With the help of the most modern digital tools, disabled and even deceased actors are reappearing in movies. The use of Deep Fake technology provides such an opportunity to modern cinematographers.

7. With the help of Motion Capture technology, certain innovations can be applied in shooting crowd scenes. It is possible to realize crowd scenes with a digital model of an actor, shooting through a special costume.

Promotion of culture

It is possible to come to the following conclusion in the end: Multimedia and ICT create new opportunities in the promotion of our culture, as well as in the preservation and transmission of our national culture to future generations. Research and study of Internet resources, creation of new sites play an indispensable role in the promotion of Azerbaijani culture. In addition, there are some defects in electronic resources:

- Existing sites and electronic resources are not regularly updated and new information is not added.

- There is very little information in English on the websites of cultural institutions.

The cultural policy implemented in Azerbaijan gives reason to say that there are good opportunities for the use of new information technologies in the field of culture in our country. Every user who has a computer and access to the Internet anywhere in the world can get acquainted with the cultural values of Azerbaijan owing to this policy. The "import" of Azerbaijani culture through the Internet will have its positive results in the direction of knowing the traditions and culture of our country, attracting the attention of the world community to our republic and uniting all Azerbaijanis around common values in the future.

ICT has become a very important tool in terms of preservation and promotion of culture and intangible cultural heritage. Considering the current global situation and the fact that our country is constantly in a state of information war, the importance of modern technological innovations, means of communication and the international electronic network becomes an even more important factor. The use of the international electronic network and various internet platforms by professionals and high-class specialists, as well as the availability of state support in this work are important factors. It should be taken into account that the formation and development of the cultural policy of our country is primarily under the authority of the Ministry of Culture of the Republic of Azerbaijan. That is, the website of official institutions and the properly organized work of social networks are particularly important in this direction.

Protection of cultural heritage. Major and minor conflicts occur at different times in different regions of the world and monuments, complexes, religious and historical buildings that can be considered universal cultural heritage are seriously damaged in such conflicts, and destroyed occasionally. From this point of view, we should not forget the acts of cultural

terrorism committed against the national cultural heritage of our people since the end of the last century, destroyed museums, razed mosques and our ruined cities. According to the international experience and examples we mentioned during the research, it is possible to implement many projects in the process of cultural heritage preservation, restoration and reconstruction with the help of modern digital equipment and devices. The help of artificial intelligence and robots can also be used in this field. As we mentioned above, robots provided with artificial intelligence are already applied in the preservation of material cultural heritage samples in different parts of the world. It is also very important to create three-dimensional digital models of historical, religious and cultural monuments that are in danger of being destroyed due to different reasons in different parts of our country using modern devices. Such digital models will be of great help in various restoration and reconstruction projects in the future. Already lost, completely destroyed monuments, complexes and other examples can be restored and reconstructed on the basis of photos and video images taken at the time. These models can be an invaluable tool in the restoration and reconstruction of monuments in the future. Samples of fine arts, miniatures, ancient books and manuscripts and documents can also be digitized with the help of modern digital equipment. All possible means of the latest ICT, cameras, still cameras, scanners, computer programs, Internet resources and other means should be used as widely as possible in the preservation of cultural heritage.

It should also be taken into account that our republic has experienced two devastating wars in the last half century and that the country has been living in war conditions for almost 30 years. We witnessed incidents of vandalism during the occupation in dwelling areas liberated from occupation in the autumn of 2020. Historical monuments, places of worship, religious buildings, museums and libraries located in our historical areas were destroyed, razed and looted. Extraction of

digital models of cultural heritage samples, texts, books, historical documents by digital means is very important. The building of digital models of cultural heritage samples, texts, books, historical documents by digital means is very important.

Artificial intelligence

So, we discussed the participation of artificial intelligence systems, robotic and automated systems in the process of artistic work and the potential problems of artistic work. We have tried to find the root of the problem, to look for possible answers to the questions by giving several examples. Of course, there are quite a lot of examples of the participation of artificial intelligence systems and robots in the creative process, being the direct author of the process, and there is quite a lot of experience in this field. We think we can come to a common result by analyzing the examples and real experiences we have discussed and by analyzing the information we have learned and obtained. Italian philosopher, writer, Professor Umberto Eco expressed an interesting idea about the computer: "A computer is not a smart machine helping stupid people, but just a stupid machine working in the hands of smart people". Computers, various digital equipment or robots are products of human intelligence. All these technological machines, no matter how perfect they may be, depend on human intelligence. A chess supercomputer beating the world champion doesn't mean anything. On the other hand, we cannot compare machines with human. It would be absurd to compare a racing car produced with the help of modern technological innovations with an athlete who broke the most incredible records in running. Technologies such as "mapping" in theater and other performing arts, "motion capture" in cinema and 3D are leading art to the future.

However, despite all this, art does not depend on new technologies in general. Even without the use of new technologies, it is possible to create a theatrical performance that meets high taste and showing any play to the audience with high artistic taste. It is possible to find high artistic design in the

theater without using any technological innovations, to create amazing works of art on white paper with just a pencil, to convey strong emotional feelings to people even at the peak of the development of new technologies.

An electric guitar or any digital musical instrument cannot draw hundreds of thousands of spectators to large stadiums. A guitar is just an instrument. What attracts people to the stadium is the skill and professionalism of the musician, in short, his creativity, not the instrument. Of course, as we mentioned above, the incredibly fast development of high technologies makes it difficult for us to make any accurate predictions about the future. But if we take into account all the above mentioned opinions, we can say that for now robots are losing to humans in this field, and I hope that they will lose in the future. Various types of digital equipment, computer programs, algorithm and coding are tools in the hands of a smart person. So, our final conclusion is that art is a field that robots cannot occupy. Artificial intelligence systems cannot have independent work, they are just a tool for humans. Let's hope this will always be the case.

We talked about the relationship between artificial intelligence systems and art and the use of artificial intelligence in the art process. We also talked about the use of industrial robots in contemporary installation art. These examples prove once again that it is possible to create interesting and very successful projects with the use of modern information technologies, collective work of professional IT specialists and creative people. Besides the artistic content, the quality of the scientific and technological content has a special weight in the successful outcome of robotic installation projects. Besides creative people, IT specialists, computer programmers and engineers should work as a team in the construction of such installations.

The installations we are talking about are quite numerous, and installations built with the help of robots are more common

now. Such projects are exhibited at contemporary art exhibitions, science festivals, car shows and exhibitions. As a rule, these installations are made in the form of a show, temporarily and have no particular artistic value.

We see the essential work of various artists, besides computer engineers, coding specialists in the creation of the projects we discussed. The influence of the dancer and artist on coding and algorithm systems is undeniable in the projects we have mentioned above. A highly art process cannot be realized without the collaboration of a specialist, who runs the software of a robot that performs delicate movements in an installation structure, with choreographer. A heavy industrial robot is driven by some kind of coding, but the coding is taught by a human – craftsman. As in music and fine arts, examples of robotics used in installation art are created with the help of musicians, artists and choreographers. This is where that the fact that information technologies are combined with art is obvious. So, art becomes technological, and technologies become artistic and aesthetic.

Modern digital technologies, artificial intelligence systems make it increasingly difficult to distinguish real media from fake media. Using Deep Fake, which is built on artificial intelligence systems, it is possible to create a fake video images that does not reflect reality by placing any visual image on another video images. The aim is to create media images based on digital analysis and digital design that create hyperreal video images that have never existed before. Artificial intelligence can be used to revive an actor or a famous figure in any video or film, who has no motor activity or who already lost his life.

In particular, it should be stated that the use of the abovementioned technology has led to the emergence of many illegal videos and fake images in the world, and in turn, this type of technology has led to a large number of dissatisfactions. The creation of unreal videos of people, especially indecent (erotic) videos through technology has increased. These cases caused the rightful concern of actors and actresses, famous figures more. At

the same time, technology can lead to the sharing of false information and the showing of actions that do not reflect the truth without the permission of political figures, heads of state and public figures. Unusual images of various public figures, politicians and heads of state that do not reflect the reality may appear, which would lead to dangerous consequences.

Digital Humanities

Art History is entering a completely new phase due to the opportunities created by digital equipment, Internet resources and ICT in general. Long distances are now accessible with the help of modern ICT. Information and materials for use in Art History research and scientific literature are made accessible to scientists and researchers with the support of electronic resources and internet platforms. Of course, libraries and archives have a lot of materials that have not been converted into an electronic version. However, the existing electronic resources and internet platforms provide enough material, and these electronic materials are constantly increasing every year. The electronic databases mentioned in the dissertation provide researchers with millions of valuable materials.

Scientists and researchers conducting Art History research must be able to use electronic resources, ICT, modern devices and equipment in the modern world.

Qualitative changes are taking place in modern culture as well as in economy and society during the process of globalization. One of the important trends in the development of the 21st century culture is the striving for mutual penetration and synthesis of cultures. Modern human lives in the field of extremely rich information, accompanied by the acceleration of the process of information acquisition. Mass media and computer technologies influence this process greatly. The development of new communication and multimedia technologies, lowering production costs and accessibility of products by using them, the constant expansion of computers and computer networks make the world denser and bring

countries and peoples closer to each other. The technical possibilities, evolving with the increasing dynamics of the electronic environment have a direct impact on the mentality of modern human. The media environment and the unimpeded access to information provided by this environment and the freedom of choice also influence human thinking and subconsciousness. So, a new type of culture – the information culture of the society is being formed. Information culture is a single, indivisible field formed by the user for his own purposes.

So, the interaction of culture with information technologies becomes particularly relevant. Information technologies create new opportunities for the popularization examples of tangible and intangible heritage and comprehensive development of intercultural exchange. The preservation, study and promotion of cultural heritage become a means of developing the cultural and national identity of the people and the state, as well as the cultural unity. This becomes especially relevant against the background of mass globalization, ethnic assimilation, loss of languages and national minorities. The popularization of knowledge, cultural memory and information about cultural heritage can contribute to the preservation of national (ethnic) cultures, the preservation of cultural diversity and finally, the preservation of the humanistic foundations of human civilization. Information and virtual reality technologies create a unique opportunity to learn as much as possible about this important aspect of every human life.

The COVID-19 Pandemic

The COVID-19 pandemic that broke out in the Wuhan Province of the People's Republic of China in December 2019 and covered the world in a very short period of time, shook the global situation fundamentally in the world. The terrible disease, which spread with lightning speed, revealed various lacks in the established health systems around the world. In a short time, humanity was helpless in the face of a huge disaster.

As a result of the pandemic, the world economy has significantly declined, and the tourism and hotel business has almost collapsed. It should be stated that tourism was one of the spheres most affected by the global pandemic. Undoubtedly, the field of tourism is directly related to the field of culture, and this collapse has affected cultural tourism. Cultural events, concerts and exhibitions that were canceled almost all over the world are an obvious example of this.

Of course, people could not be allowed to stay away from concerts, performances, exhibitions and other cultural events during an unexpected natural phenomenon. From this point of view, of course, all these measures should be highly appreciated in the context of social isolation and postponement of cultural events. Of course, the pandemic is not forever, and I believe that people will return to their normal daily lives soon, attending theater, cinema, concerts, exhibitions and other cultural events. Of course, various remote concerts or video performances cannot replace real events, the live performance of a musician, actor, singer who communicates directly with the audience. However, we have to admit that ICT is a wonderful and effective means to provide people's cultural recreation with high artistic taste in the current situation and to ensure continuous participation of creative people in the artistic process. It is with the help of new media technologies, social networks and Internet resources that museums, theatres, galleries and creative people in general can present the artistic products they have created and preserved to their listeners and viewers. So, we can say boldly that modern ICT has greatly helped people, especially creative people to get through the current pandemic period more comfortably and with less harm. Art works created as a result of the widespread use of ICT by cultural and art figures and institutions were successfully presented to viewers, listeners and fans, preventing people from staying away from active cultural life, even if they did not replace real communication.

The main content of the dissertation is reflected in the applicant's following monographs, articles and conference materials:

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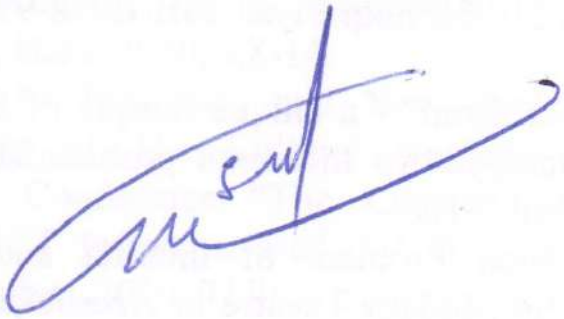

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