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Interactive Sound Installation as an Implementation of Contemporary Communication Models

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Abstract: Digitalization, virtualization, commercialization, loss of integrity, polystylistics, liberation from any norms are the latest trends that determine the development of contemporary art. They influence the functioning of communication models in the postmodern era that evolve in accordance with the achievements of technology and acquire mobility, variability and interactivity. Interaction between social processes and scientific and technological achievements is increasing, the essence of communication in the space of postmodern culture is being rethought, particularly, the boundary between the types of art is being levelled. The latter phenomenon leads to the emergence of new instruments and methods of artistic creativity and expands the possibilities of artistic self-expression. One of the promising areas of artistic exploration is the creation of sound interactive installations. This paper proposes a classification of communication models that are based on the analysis of interactive sound installations. The classification is based on determining the degree to which audiences actions influence the final sound result of the creative action. The paper claims that the parameters of the exhibition space are important components of the installation's structure and form. A dialogue with nature by way of incorporating sounds of nature, their imitations, and interpretations in art objects is found to be a current trend in interactive sound installations.

Keywords: *contemporary art practices, interactivity, sound installation, visual arts, communication model.*

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Introduction

Every age creates its own "picture of the world", a way of seeing the world, a set of general, mostly implicit preconditions of artistic creativity, and its own art. The change of historical ages means a radical transformation in the artistic vision and a radical revolution in the artistic interpretation of the world. It also means the emergence of new kinds of artistic interactions, communications, forms, means and practices. At the beginning of the 21st century, the need to update the basic principles of communication in culture stimulated the transformations that were most pronounced in the art of 2010-2020. At this time, cultural patterns are actively changing, which require an original interpretation and practical expression through new artistic means, methods and forms of communication.

The tendency of contemporary art to expand the traditional visual form evolved from the desire to go beyond the flat surface into space, with its volume and three dimensions. The key link here is the sound, the existence of which unfolds primarily in time. The appearance of the sound immediately changes the coordinate system of the work, joining space and time, and in turn, it significantly affects the renewal of the expressive means of artistic language (Kagan, 1972). World practice proves that interactive sound installation has become a striking example of how visual and sound components in contemporary art communication can be melted together. The practice also ensured the compliance of this art form with the needs of the present-day audience. Today we return to the understanding of the text as an intentional object that has the property of otherness because there is an indirect, symbolic message behind its signs, which is the real content of artistic communication is felt (Losev, 1995; Yudkin-Ripun, 2020). And the projects that represent interactive installations are the embodiment of the idea of openness and variability of works of art (Eco, 1994).

Usually, new methods of art presentations require a certain amount of time to be understood and accepted. Today, this "understanding of the context is manifested in the artistic practice itself through the transition from the creation of individual works of art to the creation of artistic installations that allow thematizing the organizational prerequisites of this practice" (Grojs, 2018, p. 90). Current methods of artistic creation are alternative, innovative, however, they arose on the basis of traditional approaches and are implemented in contemporary art projects.

In this paper, we will focus on one of the most popular formats of contemporary art - interactive art, the choice of which is dictated by the level of activation of the senses and artistic perception of the audience. A. Losev,

a well-known researcher of the cultural and artistic processes, distinguished two main categories of artistic worldview: musical and figurative, otherwise known as visual (Losev, 1995). Despite the difference in the nature of the musical and visual worldviews, in the synthesis, they enhance human comprehension of the artistic image, because together they combine several sensory channels of perception. A similar idea can be found in the works of Otto Spengler, who pointed out the incorrect categorizing of the arts on the basis of their impact on the senses (Shpengler, 1993).

Given the above, we believe that to study the impact of today's technology on the emergence of new forms and means of artistic creativity is an important research task. In our opinion, it is necessary to analyze the dynamics of sound installation in individual art projects, the communication aspects that go beyond the traditional interaction between the author and the audience, as well as the classification of these phenomena.

The purpose of this paper is to identify trends and prospects in the development of contemporary art, in particular, to highlight the parallels between artistic practices and socio-cultural processes that are implemented by contemporary communication models. It is important to analyze various interactive sound installations, possibilities of their implementation in artistic practices in terms of ways of interaction of sound and a visual component, highlighting the dynamics of changes in the communicative model depending on the author's level of interactivity of the work.

Analysis of recent research works and publications

The studie is based on researches in the field of art history, theory and history of culture, philosophy, culturology, etc. In particular, the issues of actual trends in art and the involvement of new media are covered in the works of Michael Filimowicz (2019), Boris Groys (2018), Manuel Rocha (2002), Voelker Straebel (2008), Olga Shustrova (2013) and others. The music semiotics was the subject of the works of Boris Asaf'ev (1971), Alexei Losev (1995) and others. Problems of sociodynamics of culture, as well as society's developmental stages, considered on the basis of technological achievements, are the subjects of works by Marshall McLuhan (McLuhan, 2007) and by Abraham A. Moles (Mol', 2008). The process of finding new semantic signs of artistic language determine the turn to today's technology as a tool to express an art idea that stimulates the transformation and development of all spheres of life, including, above all, the cultural sphere.

Mikhail Bakhtin (1979), Umberto Eco (1994), Yuriy Lotman (1977), Georgiy Potcheptsov (2009), Ihor Yudkin-Ripun (2020) and others wrote

works on the subjects of the communication model development and the respective impact of different types of communication.

To reach the purpose, we used the following methods: synthesis and analysis for elements and characteristics of interactive sound installations; analysis of structure and function to find patterns in incipience and development of sound installations and creation of new communication models.

Communicative models in art: historical context and types

The reality of life is represented in the art that is free from rigid rules; that ruins all previous etalons and standards; that aims to create new and original practices with different ways of expressing the subject. The speed and recognition (artistic as well as sociocultural) become important components for art practices. Speed is an important factor for contemporary artists because prolonged creative searches could cost him popularity, the audience will favour another artist, the subject can become outdated. Contemporary artists in general do not correlate their work with the eternity of transcendency. Speeding up of the production, speed of communication, digital technology force artists to look for new ways and means to express the creative concept.

There are verbal and non-verbal means of communication in the structure of art language semiotics and semantics. The combination of these means is an efficient practice of cooperation between a contemporary artist and the audience. Harold Lasswell, based on Aristotle works, proposed his own model of communication: "Who? What? Which channel? To whom? To what effect?" in 1948. Who - is the source of information; what - is information itself; which channel - the tool for communicating the information: to whom - the audience; to what effect - result (Lasswell, 2007, p. 216).

Asaf'ev proposed a model "composer-performer-listener" (Asaf'ev, 1971, pp. 357-358), which was topical in the context of classical-romantic tradition, in which every side of communication played its own role. Today this model is losing its novelty because of a renewal of forms and genres in composers art.

The rapprochement of communicational roles of composer, performer, and listener started in the first half of the 20th century. Instances when the composer delegated some responsibilities to the performer, which bring the latter closer to co-authorship, and in particular, aleatoric music, proves this. Its aim changed from the texture of music material (composer indicated the approximate rhythm, dynamics, general character and time

limits) to its formatting (performer is free to choose in which order to play the fragments). It is worth mentioning unlimited aleatorics in which the composer creates graphic notation and the performer interprets it to his own liking.

The chance factor, which is a core feature of aleatorics, gets alternative meaning with the emergence of interactive installations. The elements of the communication triad were transformed in composer's practices in the second half of the 20th century because it was possible to combine them in one person: the composer can be a performer or this role can be played by the audience.

We assume that these processes can be linked to the invention of sound-recording and to experiments with recording and application of sound effects in *musique concrète* (Edgard Varese). Later they were transformed to contemporary experiments with sound installations. It is worth remembering sound experimentations by Yevgeniy Sholpo, Mikhail Tsekhanovski, and Leon Theremin in 1920s. One of the first examples of interactivity is theremin or termenvox - an electro-musical instrument which is controlled remotely (without physical contact with instrument), and whose sound depends on the speed and position of hands of the performer. All kinds of noises, sounds of indefinite pitch and origin can serve as material for interactive sound installation. Exhibition space, visual component and technical means are the tools for building interactive sound installation: "sound installations are determined or influenced by the acoustic properties of the spaces in which they are presented. They are place - or site-specific in picking out these or other architectonic dependencies as their major themes or (…) in referring to the historic or other cultural implications of the space" (Straebel, 2008, p. 43).

Straebel says that the space is the most crucial factor which determines visual and sound components of sound installation

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Interactive sound installations as the method of artistic communication

At early stages sound installation was implemented in a gallery space as multiaspected art-object, which transcends visual art and uses sound as an instrument for artistic expression. The integration of the sound with works

of artists gave a start to sound-art phenomenon, which, at early stages, was linked to museum spaces and galleries. In recent years sound-art is implemented in works of composers that work primarily in electro-acoustic, algorithmic and noise music.

Even first attempts of creation and realization of interactive sound installations had an impact on the communication between artist and the audience and on the content of this communication. This communication was innovative because it created communication space between subject and subject, in which each participant was an independent part. Interactive sound installation - a new method of artistic communication – resides on understanding of the human being as one who is aware of new aspirations and internal need of integration into topical sociocultural process.

The phenomenon of interactive sound installation is still developing. Gradually it acquires new characteristics, means, forms etc. Nowadays, apart from the sound, it consists of light, color, plasticity component (sculpture), video. Interactive component is mandatory: technical tools for reading and transferring information, that make possible the processing of information and two-way communication between the sound source and the audience.

Different types of interactive sound installations are defined according to the use of the sound component. In one instance, the audience presented with prerecorded sound material in the form of an integral piece. In other - the installation transmits separate pre-programmed sounds, that are determined by the actions of the audience, in particular, by their engagement in the artistic process.

In the first instance, the final result is determined to some extent, while in the second one - in interactive installation - the final result is always unpredictable and cannot be replicated because it depends largely on the actions of the recipient.

"Whether the installation is precomposed or interactive, the visitor's ears and brain remain the fundamental interface for their experience with the sounds. The artist/designer affects the visitor's experience by selecting and/or designing a set of sounds to create the sonic environment guiding the passive experience. When the interaction is included in the design, the visitor's body is included too. The artist/designer creates not only a subset of sounds for the environment but the relationships between the sounds and the actions of the visitor" (Filimowicz, 2019).

Choreographic project *Pathfinder* (Onformative, 2015) is an example of the second type of interactive sound installation. Its aim was to explore new possibilities and means to use generated graphic content as an artistic momentum. Pathfinder (Onformative, 2015) becomes a tool that generates

graphic patterns that stimulate the creativity of dancers and serves as the source of visual inspiration. *Onfomative* studio of generative design and choreographer Raphael Hellebrand worked on the project. Hellebrand's works combine street dance and contemporary dance. Improvisation became a foundation for choreography. Computer-generated geometrical shapes, lines, patterns or abstract shapes were interpreted by the choreographer in the process of improvisation. The dance often implemented spontaneous visual images. A significant number of "geometries" gives the dancer innumerable numbers of interpretations and implementations. *Pathfinder* (Onformative, 2015) had come to an end and was presented at Choreographic Coding as a part of the research project Motionbank the Forsythe Company.

Michael Filimowicz says that:

"... not every digital interaction is interactive" … "We separate the terms responsive, interactive and generative to indicate the type of agency a visitor has when engaging with a system. These designations label the extremes on multiple axis in an interaction. So, a system may be partway between responsive, interactive and generative while containing elements of each" (Filimowicz, 2019, p. 124).

One of the first creators of sound installation was Max Neuhaus.

"Utilizing his sense of sound and people's reactions to it gained after fourteen years as a musician, he began to make sound works which were neither music nor events and coined the term 'sound installation' to describe them. In these works, without beginning or end, the sounds were placed in space rather than in time. Starting from the premise that our sense of place depends on what we hear, as well as what we see, he utilized a given social and aural context as a foundation to build a new perception of place with sound. With the realization of these non-visual artworks for museums in America and Europe, he became the first to extend sound as a primary medium into the plastic arts" (Monoskop, 2011).

In our opinion, John Cage's ideas, in particular, creating new art forms during their public performance and interpretation of sounds of the environment as the sounds of musical instruments, are the basis of Neuhaus concept. It is important to say that Neuhaus projects were provoked by social phenomena, which inspired the artist to create and implement new artistic practices, and were intended to receive the reaction (reflection) on the polemic ideas, realized in the project, from the audience.

The interest in sounds of the environment, especially sounds of nature is an important area of experiment in the field of interactive installation. There are successful examples of transferring sounds that are

generated by the vital activity of plants. For example, *The Tree Weaver Project* (Motherboard, 2014) in which biosensors, attached to a leaf, and transmit bioelectrical signals of a plant that reacts to external stimuli. This impulse can be provoked by internal and external factors like temperature, humidity, light, etc.

Plants produced the most notable impulse while reacting to external stimuli, which evoked the sound result of interaction between a human and a plant. Various sounds are generated by transforming the emotions and feelings of a human experimenter. The aim of *The Tree Weaver Project* (Motherboard, 2014) was to help plants "to communicate with the environment". All sounds presented in the project were generated in real-time, without using pre-made samples. Interactivity played the main role in the project. It was achieved by recording the reactions of the stimuli (human) and of a reacting object (a plant), the latter's reaction provokes the actions of the recipient.

Robin Minard, author of *On and Between. Robin Minard* has said that in creating this project he tried to "hear" the space to understand his own next actions. The artist wanted to integrate his project into space without changing the latter and preserving its authenticity. The installation was created for Luxembourg Philarmony space. The artist implemented his idea with the help of technical elements — he used two hundred speakers attached to the column of the hall and resemble natural elements (Philarmonie, 2017).

Yana Shlyabanska, Tetyana Khoroshun, Ostap Kostyuk, and Luba Plavska are the authors of the interactive sound installation *Verbova*. Artists turned their attention to the image of the World tree which is an important symbol to Ukrainians. Wooden tiles were arranged on the floor in the shape of a tree. Every tile had a sensor attached to it. The sound emerged as the reaction of the sensor to the touch. Interactivity manifests itself in transforming people's steps into prerecorded sounds of the woods. Choosing a certain "route" a recipient creates a certain soundscape. The duration recipient stays on one tile and the character of the touch influences the characteristics of the sound (Shliabanska, 2018).

The Tree Weaver Project, *On and Between*, and *Verbova* have two features in common - eco-oriented topic and characteristics of sound material. These installations used sounds of nature: in *The Tree Weaver Project* sounds generated by plants; in *On and Between* and *Verbova* sounds of nature were prerecorded and processed before being incorporated into the installation.

In the context of our research, it is important to bring up the question of how the audience influences the final sound result and what is

the level of this influence. Let's consider the most prominent examples. In our view in *The Tree Weaver Project*, the audience had the highest impact on the character of the sound. It is worth mentioning that the resulting sound depends on the type of the touch, the area of touch, and on several environmental factors which joined impact is different every time.

Next, in terms of the unpredictability of the final result, is *Verbova* project, because the recipient-collaborator creates the "sound script", defines the sequence and the character of his/her own movements. It is worth mentioning that the number of sound variations of this project is limited because the sounds are created by a preprogrammed algorithm. Nevertheless, the installation offers variable multi-compound sound reactions to external stimuli.

The sound component of *On and Between* is the most rigid of the three: here, sounds are fixed and transmitted irrespectively to the actions of the audience. In our view, in this project interactivity is realized when the recipient moves along the columns — he or she perceives different sounds from different speakers depending on the place where he or she stands at the time.

It is worth mentioning the sound projects by Swiss artist Zimoun. In the majority of his installations (Zimoun, 2012) the sound is the result of the setting in action movable mechanical elements. Zimoun made an important contribution in understanding the relationship between sound and space. Analysis of his projects brought us to the conclusion that one of the components of his sound installation is creating and presenting them specifically in spacious rooms. Zimoun places a significant number of mechanic elements in space in such a way as to create numerous variable compositional bodies, that are interesting for their acoustic and extraordinary visual characteristics. Despite the static outer state of the sound element in an installation, the internal dynamics of this process is evident - it manifests itself in time-space fluctuations of rhythm and tempo and in the changeable density of texture.

Despite the mechanical nature of the installation's elements, surprise and creative freedom are the core components of it, especially at the planning stage. It is particular that the final sound material resembles sounds of natural phenomena. On the other hand, the sound result of Zimoun's installations can be linked with minimalism - micro-changes occur in monotonous sound which creates the palette of various sound levels.

It is worth noting that Zimoun's installations can be called interactive only conditionally — the recipient does not have any impact on sound or action processes. But, some degree of interactivity can be seen in

the interaction of different mechanical components of the installation, and also in the interaction between the sound and space.

The role of the space in the mechanics of the installation is another question worse considering. Space was the decisive factor in the sound implementation of the installation, according to Robin Menard, author of *On and Between*. In this context, it is worth taking a look at art projects by Munich-based artist Karin Smigla-Bobinski. She has significant international experience presenting her various multitopical projects involving intermedia, video installations, science art, grounded in intuition, expression and other cognitive elements. Smigla-Bobinski (2002) works with different art practices such as kinetic sculptures, interactive installations, art interventions, objects of augmented reality, multimedia performances of real theatre and online projects, kinetic art, drawing, video, installation, painting, performance, sculpture.

Her works are created in real-time, during their presentation. In some projects, the audience takes part in the process, in others it does not. The works of Smigla-Bobinslki present new communicational models in which human's apprehension of the external process depends on the level of engagement in it. So, in a certain way, the member of the audience becomes a direct participant in the art action. But the object of art with which collaborates the human has its own "free will" — it has certain characteristics that define its behavior in the environment, and in this way it impacts the human.

The object and the subject of communication change roles during the process. The *ADA* project by Smigla-Bobonski (2018) is a good example of this phenomena. It is a transparent ball filled with helium with several elements made of coal fixed to it. The coal leaves significant marks on the white surfaces of the exhibition space (ceiling, walls, floor). At the center of the project, there is an artificial art object, resembling the product of nanotechnology. We believe that *ADA* is an interactive machine able to generate abstract images, moving almost independently and guided by visitors at the early stages of contact. It is worth mentioning that, though, Smigla-Bobinski (2018) did not pay attention to creating the sound of the installation, the exhibition space of her works is not silent — sounds are born of the interaction between the object and surfaces, between the objects, between object and members of the audience, etc.

In the *CONE* project by Smigla-Bobinski (2014) the audience is not able to manage sounds and it is a certain parallel to the works Zimoun. *CONE* is a kinetic sound installation. The first time it was exhibited in Tophane-i Amire Culture and Arts Center in Istanbul, Turkey in 2013. The

interaction between the architecture of the building and the design of the installation is an important form-making factor of this work. The installation consists of a plastic cone hanging from the iron ring harmonized with the internal space of the building. The drops fall down from the cone, which is fixed under the dome of the building, onto the amplifier situated at the center of the room, and this generates the sound. The vibrations are transferred to the upper cone via strings that are connected to the amplifier and oscillate when the drop falls. Smigla-Bobinski designed *CONE* (2014) especially for this particular space, with regard to its acoustic qualities and cultural and aesthetic significance. Today, Smigla-Bobinski works on joining the sound and space and on adding dynamics to static objects.

Based on the analysis of the aforementioned projects we can conclude that the sound component of interactive installations frequently poses as an additional element of the project but it is as important as the visual component because it enriches and supplements the latter.

Interactive sound installations in Postmodern age: types and classification

On the basis of theoretical studies and examination of interactive sound installations, the following types of classification of interactive sound installations can be given. The first type of classification takes into account the level of the audience's engagement in the process of installation, the level of unpredictability of sound material, and the level of freedom with which the audience can choose variants of action in a given installation. In this way, the recipient acquires the status of co-author, co-creator. The second type of classification is based on a variety of ways in which sources of sound extraction and transmission are placed in the space in relation to the audience. The third type of classification is based on the way the sound is used in installation and on the characteristics of the exhibition place. In particular, street installations, installations in natural landscapes, indoors installations. For example, Rocha offers the classification of installation based on the links between sound and object (Rocha, 2002):

A) close links — the object itself produces the sound.

B) distant links — the sound is a supplement to the object, does not have close links with the latter, except for the cases where an artist consciously creates links between the object and the sound.

C) open-mixed links — the object produces the sound and the sound is transformed by the artist.

Another type of classification of sound installation can be based on the level at which achievements of other sciences are used (science art, bio-art, eco-art, etc.).

In contemporary art practices the interaction between visual and audio component is possible in three different ways:

- dominance of visual component over the audio;
- dominance of the sound component over the visual;
- dialogue between the two.

The possibility of taking part in the creation of the project activates the artistic perception of the audience. It manifests itself in influencing the generation of sound and visual sequences. This supports the growth of responsibility for the choice of action in the audio and visual component of the art object.

Ideas, that the recipient gets as the result of studying the basics of the art during professional musical education, are changed. On one hand, interpretations of an interactive sound installation by a professional artist and an amateur will differ dramatically. On the other hand — the creation of interactive installation, participation in its presentation and perceiving its final results is a democratic phenomenon that makes a variety of interpretations possible irrespectively to the professional education and experience.

The research proves that today in art the dialogue as the basis of communication is a timely idea. A certain route or bridge of interaction is built from the author to the recipient and there is an impression that the role of the recipient in this type of communication grows, for the recipient influences the final stage of perception. But in reality, this is a one-way process — from the author to the recipient — which is controlled mainly by the author. This is a traditional model where the audience is offered seemingly variable perception but in fact, it is determined by the author. Installation by Zimoun, *Tree Weaver project*, Daniel Wurtzel are examples of this.

Conclusions

Globalization and digital technologies became an important factor in changing of art. An artspace became a social one and equality of art ideas and approaches became the main achievement of postmodern culture. The transformational processes of the 20-21st centuries determine the search, transformation and renewal of means of communication. Human communication is in a constant process of changes and renewal, which depends on the main vectors of society development.

The way, in which all the participants of the art action think, changes under the influence of technological innovations (first of all this applies to authors and then, as a consequence, to the audience) and new methods and means of creativity are born. Trends implemented in artistic projects gain multiplicity of variations — numerous interpretations appear and function in the art space, which is defined by the artistic projects.

Interdisciplinary borders of arts are levelled as the result of the rapprochement of visual and sound components and, as a consequence, the work of the artist takes place in multidisciplinary space. The author of the work has the ability to use the sound component as well as visual freely in an art project. It is the interactivity that permits the author to transcend the limits of his own experience and widens the possibilities of creative explorations and his or her self-realization in cultural space.

We believe that growing attention, which music installations attract, is linked to the search for new models and forms of social communication, as well as to the apprehension of radical changes in the communication process ongoing today, which started in the last century and are linked to the arrival of new technologies. Also, we linked it with an active search for new means of expression in art language and this returns us to the process of communication.

Also, we found it interesting that the overall majority of researched installations transforms and imitates sounds of natural environment phenomena, focusing the attention of the audience on topical subjects of today, in particular, on ecology. (It is worth noting, that we looked only at the most significant interactive sound installations of the last twenty years). Though the interest in sounds of the natural environment was present in the explorations of 20th-century artists, the realization of such projects was possible only because of the progress in recording, broadcasting, playing and generating the sound.

The functions of composer, performer and listener get broader and, in a certain way, collide with each other. In particular, the author of an idea offers certain terms, means and ways for realization of a particular scenario, which depends on the participants' engagement in creating and presenting the art project.

Considering that the genre of interactive sound installation a relatively new and is still developing in an active and dynamic way we believe that future scientific research of this phenomena, its classification and analysis of its transformation in postmodern culture is the prime direction for further scientific research.

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