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## Understanding Music in the Digital Media Era

Irina Levina <sup>a,\*</sup>, Liubov Ukolova <sup>a</sup>, Svetlana Nizamutdinova <sup>a</sup>

<sup>a</sup>Moscow City Pedagogical University, Russian Federation

### Abstract

Digital systems change attitude to music as the sound dimension of cultural life, which can be transformed into a commodity. Despite the fact, that people increasingly interact with each other via digital media, attributes of music underlying the ability for communicational interaction, are often ignored. Even though even before music digital reproduction methods emerged, music was subject to assimilation in the exchange economic acts, now digital world has permanently altered ways of interaction with music as now it is based on datification of virtual actions and digital shades of random preferences. Music is simultaneously interactive and presentational and in the participatory mode, including its collective, non specific interactive creation in real time, it possesses significant individual and social implications. Music as part of real life is not really presented in the virtual reality and its potential social costs are still to be comprehended and evaluated. Everyday communicational interactions among people face to face are filled with musical models between interlocutors as they share features with music itself, but these constituents are absent in digital systems, designed to perform communicative functions. The article introduced the idea that digital technologies encompasses only a limited and specific cultural understanding of music, which at least distorts or even suppresses its abilities, which distinguishes it as flexible and quite functional environment for social interaction.

**Keywords:** music and social interaction, digital technologies, media space, media culture, immersive interaction, computer communication, music value, multimodality, joint music performance.

### 1. Introduction

The advent of microprocessors has permanently altered the attitude to music – computers revolutionized music production from the stage of creation to the performance of music. Digital technologies as well as economic and social opportunities, which accompanied their appearance, influence the attitude to music in modern societies at least the ways:

- accelerate the consolidation of music status as a commodity, attribute and change the ways music can be evaluated and interacted with as well as employ exchange value of music to turn it into action commodity to interact with;
- alien to developing and implementing systems that would let use music in computer interaction in real time, capable of enhancing sociality;
- developing systems of computer communication they do not consider attributes of music that are embodied in interactive options, underlying the ability to communicate (Fedorov, Levitskaya, 2020)

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\* Corresponding author

E-mail addresses: [dimacreator@mail.ru](mailto:dimacreator@mail.ru) (I. Levina)

The *purpose* of the article is to consider the idea that digital technologies cover only a limited and specific cultural understanding of music, which at least distorts or even suppresses its abilities, which distinguishes it as flexible and quite functional environment for social interaction.

## 2. Materials and methods

Nowadays there is a considerable amount of sources on how technologies and Internet institutional structures influence the roles, whereby people interact with music (Blok, Tan', 2022; Chelysheva, 2021; Nizamutdinova, 2022). This influence changed the attitude to music as much as virtual world changed the economic reality of the majority of aspects of everyday life. Research dedicated to these issues, tends to acknowledge that music today is a commodity. In the digital context it is often viewed as the object of collective interaction in virtual communities, formed around interaction with particular genres as framework for forming and representing identity instead of viewpoint of systems of real-time music creation (with a few exceptions). Thus the discourse doesn't touch upon the capacity of digital technologies to express music in the form of real-time participation, the issue of lack of musical functions in computer communication systems which is part everyday human interactions, doesn't receive proper recognition (Brodova, 2021)

The basic cognitive methods such as problem chronological and historical-situation methods are employed. Author arguments are based on problem chronological approach, whereas using historical situational method which enables to recreate the evaluative approach to the research theme.

## 3. Discussion

Music is a wide-spread cultural practice, which has been present in ancient civilizations and preserves till modern days, though its evolutionary value is not yet uniquely determined. Tribal cultures not having modern musical instruments created music in the form of song and rhythm. The earliest preserved musical instruments are flutes. Thus, several flutes dating to approximately 43000-35000 were found in the Swabian Jura (Shilton, 2022). According to one opinion, evolution favoured music-related behavior as it was determined by sexual selection and reproduction (Oosh, 2021). More recent viewpoint, taking into account modern concept of evolutionary theory suggests that music is a cultural adaptation based on survival advantages, which it presents to its members, and thus it is a complex system of symbolic heritage or an advanced form of relational response, that requires cooperation for developing and promoting unity and intimacy between groups of people. The aggregate product of its cooperation later attributes meaning and it is selected due to the circumstances of a particular socio-cultural community (Shcherbakova, 2021). In fact, music is not necessarily biologically adaptive, but it certainly facilitates improving the quality of life.

Thanks to the philosophers Yuma and Kant, concepts of aesthetic value became the key to how music is understood today. Music has value that is inherent in the uniqueness of experience, which is considered to be disinterested, meaning it does not directly touch upon the promotion of personal interests of a person (Berleant, 2018). People can enjoy music but to have esthetical and thus cultural value the experience should go beyond the framework of sensual or hedonic pleasure that music delivers (Choi, 2022).

The idea that music should be valued first and foremost for its esthetics is still confirmed in the modern discourse of "cultural products". However in the recent half of the century this idea loses its topicality despite of numerous attempts to apply the concept of esthetics for the right distribution of music value (not considering if it is expressed in terms of its transcendence, originality, authenticity) differentiating it from other form of exchange or commodity value.

The state of modern society requires reconsidering the esthetics responsible for the changing nature of art, technology and education. Changing the ways of structuring music and its significance has altered the power and distribution of music in the society. It's supposed that the revised concept of modern esthetics in music education should act on two levels. Firstly, on a personal level the learners should have an opportunity to verbalize and reflect about their student experience. It requires understanding of esthetics focused on a person and his/her discovery of music. On another level, modern esthetics permeates places and spaces beyond the study of music. This may include transdisciplinary and research trajectories, where the study of music is held together with other subjects of study. Different levels and routes of modern esthetic education may work together in a dialogue despite their inner differences. Art has the power and ability to question both in theory and in practice what seems so familiar and obvious. These are great challenges and breakthroughs that cross boundaries of music as well as music and art education, in

order to create new opportunities (especially in dialogic areas of learning and teaching processes) that have been hardly ever or never used before (Gruber, 2019).

Unfortunately, today the aesthetic value of music determines its monetary value as in modern societies music has become a commodity, its cultural value is reduced to its price (Molina, Santamarina-Campos, 2021). Any object can be viewed as a commodity if its exchange potential in the past, present or future is its socially significant feature. Turning music into a commodity can be considered as a state, dependant on contexts due to which music becomes realizable and playable first as a text and then as sound.

In pre-modern and early modern Europe scribes were instructed to create manuscripts that include note recording. The cost and value of such services and the potential mobility of the scribe can be viewed as a mechanism that enabled note recording to become a commodity. Though note recording and skills necessary for its creation were not full-fledged commodity, they let music take its place in the exchange economics rather than remaining a mere service or obligation. With the advent of printing in early modern times, music has acquired more than rudimentary status of a commodity due to reproducibility of printed sheet music, the production and distribution of which was controlled by right holders. Rights were usually monopolistic (at least in theory), as well as generally inalienable (non-transferable), allowing rights holders to profit from the sale and distribution of music in a musical form.

By the middle of the XVIII century sheet music has already become a mature note and text commodity enjoying property ownership rights, which were fully alienated now. Those rights usually belonged to the publisher rather than a composer. Thus existing music in the printed form in capitalist and exploitation context of Britain at the time, allowed the exchange potential of music to come affront. The publisher physically owned engraved print forms (a means of creating and reproducing sheet music) and practically controlled the sales and distribution, though it was increasingly disputed by composers.

Although there are no complete records of eighteenth-century British music vendors, we can still assess which music and which musicians were probably sold well, based on various sources, including newspaper ads, claims of copyright infringement and registration in the registries of stationery companies. No less valuable, but much more rare are the financial documents from the music sellers themselves. One important collection is the album, which mainly consists of copyright receipts, agreements and letters from musicians to music sellers John and Thomas Preston, as well as Coventry and Hollier, dated 1773-1843. These receipts not only contain new information about composers, genres and arrangements that music sellers considered most in demand in the market, but they also give some idea of the typical prices paid for writing and adapting music, as well as the conditions under which composers transferred their copyright (Mace, 2019).

Later at the turn of the XIX century the emerged concept of “artwork/piece of music” – an idea that music exists in the form of separate and identified essences, created by particular people, helped even more to strengthen the status of music as a commodity, simplifying its perception as a discreet and selling unit. This status was fully confirmed with the emerging technology of sound recording and reproducing. Music eludes its own ephemerality, as a music performance can be embodied in the endlessly reproduced footprint of its performance. In the XXI century transforming from physical to virtual form, music and its value are assimilated to meet the needs of market economy as first and for most a commodity with hedonic value (Chelysheva, Berezkina, 2020; Ukolova, 2021).

Music nowadays is a product of creative and cultural industry, the audio entertainment technology, somehow known to every society on Earth. Property rights largely belong not to artists or performers but to those who own means of music reproduction and distribution as it was in the XVIII century. Music contributes to the global economy as an essential component of TV programmes, computer games, films and advertising.

The production, playback and promotion of music has radically changed with the introduction of limited consumer file formats such as MP3 and Digital Rights Protected Streaming (DRM). Modern people interact with music with absolutely different ways – the advent of the Internet has brought with it new forms of music delivery and new types of music-related transactions that have allowed access to a wider range of music (Hesmondhol, Meyer, 2018). These changes also bring with them new concepts of “ownership” of music, which are limited by certain conditions (for example, time (Hesmondhol, 2022)).

#### 4. Results

Prior to the onset of the digital era, the most popular mass media types were those which are now called analog or traditional: radio, newspapers, magazines, billboards, etc. Since then technological revolution has brought a number of new types of mass media, which now play an important role in the information and entertainment distribution among the public worldwide. In the digital age building a strong web presence plays a significant role for music promotion. Effective branding helps musicians to stand out in a crowded market. Releasing interesting content lets musicians communicate to fans and attract new audience. Social media platforms play a crucial role in forming an engaged fan base, providing direct channels for communication and fostering a sense of community.

Internet media, which is defined as a sum of all information resources available to Internet users, positions itself as liberation from one-way chain of communication as users can now become media producers, create own music or get certain level of control over corporate media content. Though such kind of liberation seems to be illusionary as even those who do not participate in creating content but just consumes music eventually generate data for improving content, delivery systems or recommendation mechanisms as well as increase popularity of the online media business.

New actors that can also be called new publishers are Internet platforms like Google or Yandex and their system partners, that contribute to the commercialization of interaction between consumers and music. For example YouTube collects preferences and associations, showing target advertisement and using customer data for their algorithms optimization and establishing bonds between other kinds of data with the user being the core of this information system. Thus music has become a random characteristic of co-modified data alongside with other media. Such data on its own is a form of valuable capital as it can be used for profiling and orientation of people, system optimization, modeling probabilities, enhancing the value of assets as well as management and control. In other words virtual life mining that is extracting useful knowledge from a combination of digital tracks, left by people who spend most of their life in the Internet, which enables companies that run the abovementioned social platforms to measure, manipulate and monetize behavior of people in their own interests. It's worth mentioning that such data analysis may not only bring one-sided benefits. It has become a vital tool for understanding audience preferences and optimizing music promotion strategies. Using data-based information, artists and labels can target niche markets, tailor their campaigns to specific demographics, and make informed decisions about their promotional efforts. There are many examples of successful companies based on data analysis, displaying the effectiveness of such approach.

However digital technologies are not reduced to the esthetic value of music to a simple entertainment – they just speed up the existing processes. Social and technological changes grant music a status of traded and reproduced commodity, existing in the form of a text, sound or song in the formats which can be owned and exchanged. The factor that supports music's constant commodity status is desirability, resulting from enjoyment it delivers, which is now used as a stimuli to gain a truly valuable asset such as demographic data.

In the non virtual world music as a digital commodity or a decoy for data collection is just one of the aspects. Music exists in all known cultures that expect the meaning of their music pieces to be understood. Music that is listened to, transferred or created is more than a sound that is consumed and valued from an esthetic perspective. It's a dynamic sample of an embodied mind, movement and social interactions, formed by biology and culture.

An area that tends to be privileged in a musical context is a presentation activity, which presupposes a distinct distribution of roles between those who create music (performers) and those whose aim is to consume music (audience). Performers usually have to receive a formal training or devote much time to acquiring musical skills whereas audience may also display different level of knowledge in the field. A typical example of music in the presentation mode is a concert. Although it may include interaction among performers or even between performers and the audience, the roles and ways of such interaction are likely to be relatively fixed. Recording and streaming takes music out of the concert ritual. Today there are many places you can listen to music, in addition to the concert hall such as a car ride or a jogging in the park. Some composers may still create progressions that determine movement over time from the beginning to the end, but listeners are no longer fans of the concert ritual that perpetuates completion – technology has freed them from the fullness of the musical form. Modern music is more like a mosaic of loosely related events rather than a constant movement through time. Such new approaches are consonant with

the listeners' ability to choose the limits of their listening time for themselves (composers who continue to ignore this fact to certain extent lag behind their time).

Cooperative music creation presupposes that roles of the participants can be open and mobile whereas their experience can be minimal, and interactions have a high degree of mutual adaptability. Music-sharing is always culturally specific. Almost any music is partly presentational and partly collective. In the context of the presentation, performers need an audience whose reactions can shape the mood, and sometimes determine the direction of the performance, actually becoming part of it. In collaborative creative contexts, music creation can demonstrate such presentation features as structure complexity or hierarchical differences among participants, with some playing more important roles than others. However, collective music almost always lacks the attributes of virtuosity, complexity, well-thought-out temporal structure and sound expressiveness, which reduces its attractiveness to the audience, which results in reducing the commercial value (Vyaznikov, 2022). Nevertheless, collective music (for example, choral lessons) actively promotes the formation of musical and aesthetic taste (Gribkova, Kazakova, 2021).

In general, collective music in its participatory forms in real time in the digital world is minimal. The economics and opportunities of digital networking do not provide the means and incentives for the implementation of collective music systems that would allow it to appear in a form similar to its existence in the analogue world, erasing the possibility of collective participation in music in the ways that are incompetent and transgressive. Thus, the ability of music to engage and shape relationships between interacting non-expert people is one of its core abilities in the real-time non-virtual social world but it is hardly reflected in its digital manifestations.

Another aspect of music that should be considered in the above-mentioned context is its manifestation in the set of interactive abilities that underpin everyday communication. While speech production and dialogue computer interaction have passed a long way, the coordination features that shape most everyday conversational interactions seem to be built on the same foundation, that music is now beyond the potential of computing systems. In a sense, this is not surprising, although intuitively music and language have a connection (songs constitute prevailing types of music), but people explore them as two completely different areas of human experience.

Music and language or rather music and speech, language in action can overlap significantly in what they are and what they do. Conversational interactions, especially those that can be characterized as affiliative or as forms of phatic communication (making contact to maintain communication), seem remarkably similar to collaborative music, in which the input of all participants is carefully coordinated over time and differentiated by function to form the overall structure of events and facilitate their continuation. The processes that provide this coordination are common to both speech and music, so it is likely that human real-time communication cannot be modeled as a process, explained solely in terms of individual generative and representative abilities. Any attempt to model such interactions must take into account underlying relational processes that are fundamentally musical and depend on the mutual dependence of the interacting persons (Pej, Kaznacheev, 2022).

When speech and music are considered in terms of participation, they clearly demonstrate the common ground. The aspects of human interaction that are considered musical such as common pulse, alignment of tones between participants and coordinated movements act together penetrating conversational interactions, strengthening the view on music as a human communication toolkit component. It can be argued that the nature of music as an interactive environment lies in the ability to communicate and manifests itself in all communicative efforts. From this perspective, music abilities are as universal as language abilities or to be more precise speech abilities. Languages have melodies that linguists call prosody. Such elements of music as pitch, rhythm and tempo convey emotions in speech. With their help, people without understanding other languages can still detect changing emotional states of the speakers. Moreover, compared to language, music has rules for ordering elements, including notes, chords and intervals, which turn them into complex structures that convey emotional meaning. Because of the similarities between music and language, many brain regions responsible for speech also process music. For example, it is not necessary to know the language in which the song is performed to understand the message or feeling that the performer is trying to express (Alyabieva, 2021; Korsakova, 2021). In addition, musical sounds can cause human color associations. It concerns certain connection of absolute sound pitch and/or tones with particular colors. Musical-color synesthesia as well as color hearing (synopsis) is a type of chromesthesia in which musical sounds cause certain color images in humans (Alyabieva, 2020).

The influence of music on emotional intelligence has been widely discussed recently and is an important indicator of how well a person can modulate and interact with emotions. Since early childhood, simple ways of playing music, such as singing, increase sensitivity to emotions and help to communicate. Listening to music and playing a musical instrument can improve the emotional intelligence of both teenagers and adults. It can be explained by the nervous processes in the cortical and subcortical networks of the brain, affected by music. People with higher emotional intelligence, on their part, can listen to music to regulate their emotional state (Gribkova, Ivanovskaya, 2022).

In general, the development of a scientific and educational field called media education is impossible without mass media and social media, and advanced analytical thinking is the main component of media competence. A person with a high level of media competence possesses the following characteristics: a wide range of genre, thematic, emotional, epistemic, hedonic, intellectual, psychological, creative, ethical, aesthetic motifs with media and media texts, including: selection of a diverse genre and thematic spectrum of media with mandatory inclusion of non-entertaining genres; desire for new information; desire for identification and empathy; aspiration to confirm their competence in various spheres of life and media culture (Levitskaya, Fedorov, 2021).

As mentioned above, music and its presentation have changed drastically. Some of these changes were the result of accelerating existing processes, such as music commercialization through eccentricity. Deliberate eccentricity in such case acts as a strategy to attract public and media attention. Eccentricity has become a recognizable brand, an identifier that should attract the interest of the audience, it plays a huge role in the popularization and commercialization of music culture products as a marketing tool that helps build up the image of the artist, recognize the uniqueness of the product and create different ways of interacting with the audience, though the music itself and its visual representation might be both not unique in terms of its authorship and be characterized by cultural-industrial approach to music.

Hence, modern commodification of music (absorbed by the sharing economy) began long before the idea of computational theory emerged, although the recent conversion into a random generator of demographic data brought a new twist. These accelerated changes abstracted music from the world of social life in real time, moving it into a presentation mode, tied to commodity status, limiting access to control as a means of participation. It can be concluded that computer interaction with music is distorted by corporate “thirst” for profit from data acquisition and music is rapidly losing its spiritual and moral influence (Shcherbakova, 2022). Yet music was an instrument of self-consciousness and self-knowledge, a powerful reflection of who a person is (what this person thinks or feels) – a secret language that can be studied, developed and perfected with which you can deeply penetrate the musical expressions of other people and find out what message they broadcast to the world (Gribkova, Kvartal'nova, 2021; Shcherbakova, 2020).

Are any of above-mentioned trends really challenging? Nowadays mankind definitely has access to vast amounts of various kinds of music, which can be accessed instantly and for some time free. Any changes, including those in the music sphere, are in the nature of things, and while it is possible to regret the obvious losses, these changes also have advantages. Should music be more than clickbait, the price that Internet companies pay to have a large share of unincorporated users? The answer here is positive. In almost all known world cultures, music was considered to be a manifestation of values that could not be simply reduced to economics (Shiyanova, 2022). If the world is faced with the task of saving music from its commodity status, there are possible ways to do it. Some of them are already well established, such as the development of remix culture.

Systems that exist for real-time computer music interaction typically require a high level of knowledge and access to specialized resources. There is currently no financial incentive to develop systems for unskilled computer-assisted music production, although recognition of the need to address social justice issues through community music development may encourage the emergence of such systems (Malaschenko, 2021). The inclusion of interactive features in CMC, VUI and LLM systems, based on relational musical qualities of mutual adaptation, raises two different types of problems. First of all these are technical challenges. Adaptive dialogue systems must be logically flexible and largely accurate at many levels, from satisfactory interpretation of acoustic signals to correct interpretation of interactions. Assuming that these technical problems can be overcome, the ethical problem still remains. If an interactive system behaves in a way that reproduces human behavior making it almost indistinguishable from human performance, the reaction to it is likely to change as well. It should be recognized that robots are artificial artifacts. They should not be

designed to mislead vulnerable users. The mechanical nature of robots must be absolute transparent. The introduction of human-like responses to CMC and VUI based on the musicality of everyday human interactions directly violates this transparency and leads to an asymmetry of deontic commitment in interaction.

## 5. Conclusion

Technology has always been the backbone of the music industry, and digital technology has transformed the music industry not only in the manner it is consumed, but also fundamentally in how it is recorded and performed. The metauniverse is a virtual universe in which everything imaginable is possible. When the physical environment encounters virtual reality, including augmented reality and the Internet, the metauniverse becomes a collective and shared virtual space. In the coming decade, the metauniverse has the potential to build its own economy. Indeed, music studios are no longer an expensive and “sacred” sphere of small and exclusive audience of artists. Music consumers have discovered streaming. Streaming video is one of the industries where services like Netflix are constantly creating and releasing new content. The video game industry is also booming, overshadowing all other entertainment industries. Composers, sound engineers and audio programmers play an important role in these audio-visual industries, creating important revenue opportunities. The digital age has been a hard test for the music industry, but it has also opened doors to emerging artists, who otherwise would never have received the attention they deserve. Advances in music technology have stimulated growth and innovation in the creation of music, which is, after all, the essence of art (Kochnova, 2021)

The advent of social media platforms such as TikTok has also had a profound impact on music consumption and production. The musicians adapt to the era of short-term concentration of attention, creating memorable fragments that evoke a response within seconds. These compressed formats challenged traditional song structures. Musicians are also exploring new ways to attract listeners to the fast-changing scrolling environment. This trend led to the development of special music production methods, including short tracks, higher BPM values, and innovative sound landscapes that meet the requirements of social media platforms (Zhang, 2021).

In the above-mentioned context, it's worth mentioning that within music marketing strategies one usually is unable just to sell music. When the material is released on digital music platforms, the game plan should be already created, otherwise one may not get the desired positive feedback. Much of the music release is an organizational factor of what is done long before and after the release. Another important factor is budgeting. Spending a lot of money on a song or video is no more important than bringing the song to the target audience. The released song may not gain momentum due to misinterpretation of marketing (Bochkareva, Shafeeva, 2022).

Unfortunately, music is irrevocably becoming a commodity in the digital sphere, and this situation is exacerbated by the monetization of online interactions with it. Though one may not be able to get music back from being a commodity, but it's possible to regain a certain degree of control over accessing it. In addition, it should be taken into consideration that the fullness of human emotional-sense and creative capabilities is not yet achievable for the technique of any level (Novichkov, Potapov, 2022). In order to present the shared relevance of music in the computing world, it is necessary to develop and distribute tools and systems that will allow the realization of the unequivocal but socially important ability for collaborative music creation in the digital world. Finally, it is necessary to reconsider the way society interacts with supposedly “autonomous” digital interactive systems based on modeling human communicative abilities, Otherwise, there is a risk of transferring digital social responsibilities control to corporate agents seeking to exploit it.

In the nearest future, efforts to create AI-music, which “sounds human”, are unlikely to bring any benefit to listeners and musicians, but will undeniably help to increase the profits of corporate participants, which have already largely demonstrated a lack of interest in a fair music economy, given their efforts in decoding music to make a commodity of unmusical elements such as user data, preferences, behavior, subscriptions, listeners' attention and advertising sites.

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