The Digitalization of Sound: How the Consumption of Music Changed from Vinyl to Hybrid Experiences

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Abstract

This paper focuses on how digital media and new technological devices have changed music production and consumption processes. The role of music will be discussed as a collective process fed by individual consumption through personal media, starting from a sociological analysis of the main technological evolution in its industry field. This is related to the widespread use of devices to play music at home and also on the move. From the creation of the gramophone to the Walkman, from iPods to Smartphones, music consumption has become much more liquid. Production processes have changed, moving from recording studios managed by expert composers to easy-to-use devices that enable anyone to become a digital artist. Additionally, social media represent new ways to create and share original and creative works. Today, artificial intelligence, deep learning and holographic systems introduce new innovative perspectives to create, consume, and share music.

Keywords: sociology, music, digital.

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1. Introduction

Music is essential in the social and personal lives, and it plays a relevant role in satisfying emotional, social and developmental needs (Nuttall, 2008). It is also one of the fundamentals components of Youth Culture (Bennett, 2015) which allows individuals to move in the transition from childhood to adulthood, expressing, supporting, and reinforcing their autonomy and identity in order to build and maintain an intimate relationship with their peers (Abeele, 2015).

In the nineties, the diffusion of the personal computer at home paved the way for the so-called "Digital Era" that, starting from the end of the 20th century, would seem to have determined the end of what Toynbee (2000) defined "short century of popular music", started in 1921, when the first regular radio broadcast was released.

Digital music, which by now has lost its initial technical connotation, acquires a much broader and more nuanced meaning, with a more modern and sophisticated sound, in all areas of communication, from cinema to television, from music to the Net. The present contribution traces the milestone of the socio-technical evolution that brought people to become even more active users in the consumption and the production process. This demonstrated how technological changes, since the Thomas Edition's phonograph, have influenced the marketing practices in the music industry (Ogden, Ogden, Long 2011).

We organized the discussion in the following key points: the rise of the bit; the diffusion of tools and practices that differs from the traditional business model; when users start to create custom contents; when the algorithms become the new artists.

To better understand some characteristics of the new communication media and musical phenomena, it is helpful to investigate some of the main theories related to digital cultures, new media, and the Web. In this regard, it is worth pointing out that the scientific literature in this field refers to the theories of sociologists, media scholars, and mass communication but, given the complex nature of the phenomenon, it also calls for significant insights into other disciplines, ranging from economics to information technology.

Lev Manovich (2001) defines the new media through the identification of five fundamental principles. Digital interfaces translate and process cultural products into bits (the computer language) and then return them in forms comprehensible to man according to shared cognitive patterns. In the new media jargon, "transcoding" an object means translating it into a given format. The computerization of culture gradually produces a similar trans-coding of all categories of all cultural things. That means that cultural categories and concepts are replaced - at the level of meaning and/or language - by new categories and

new ideas derived from ontology, epistemology, and computer use. Therefore, the new media act as natural precursors of this more general process of cultural re-conceptualization.

Digitizing information means translating it into digits. If it is sampled, a sound can also be digitized, measured at regular intervals. Each sample can be encoded by a number that describes the sound signal. A numerical series can therefore represent any sound or musical sequence. Images and sounds can be digitized not only point by point, or sample by sample, but also from the global structures of iconic or sound messages. Any type of information or message can be translated into numbers, and all numbers can be expressed in binary language. Lévy (1997) points out that digitally encoded data can be transmitted and copied almost indefinitely without loss of information because the original message can virtually be reconstructed in its entirety despite the degradation produced by transmission or copying. The same cannot be said of images and sounds recorded in analog terms, deteriorating with every new copy or transmission. Digital technology influences, moves and offers new perspectives of realization and fruition of the musical product and determines new creative opportunities. Technological progress, moreover, not only changes the distribution function and meaning of already existing works. As Middleton (1990) argues, it also stimulates new artistic techniques, new productive modes, and new social relations, shifting art from ritual or disinterested contemplation to the realm of everyday life.

The new technologies are part of a process of media "evolution" rather than "revolution" (in the Mertonian sense of the term). Whatever new technology introduces, it represents the improvement of previous technology, preserving its strengths and correcting its weaknesses: in this sense, we are witnessing a process of remediation (Bolter, Grusin 1999) and convergence, that is, the fusion of several media and their contents into a single instrument (Jenkins, 2006) This process allowed individuals to increasingly access the productions of their own and other cultures easily. Thanks to the creation of mobile devices, the individual can always carry this vast intercultural baggage (in the process of ubiquitous computing; Greenfield 2006) and, at any time, they can intervene on it, modifying it, widening it, participating in the co-induction of new processes.

In a nutshell, the four central aspects that, through digital technologies, characterize the processes of personalization of media fruition are: the level of simulation of reality, degree of interactivity, personalized contents, and mobility. According to conceptual schemes that make interaction as natural as possible, the user interacts with digital environments, reducing the perception of an interface between the individual and cultural object. The more "natural" actions that the user performs in digital media, the lower is the perception of the

medium itself within the interaction practices with other individuals and culture. Digital technologies are also characterized using communication systems at any time (McLuhan, 1964).

Understanding the radical changes that (thanks to new technologies) invest musical and artistic languages means evaluating how the advent of the Internet has changed our approach to the production and enjoyment of cultural products. As we all know, the Net was born with military purposes between the Sixties and Seventies and soon became a live communication space, as Manovich (2001) points out a "real time" screen. In fact, through the screen of a PC or mobile phone, the Net determines the convergence of traditional media in real time, favors potential access to infinite knowledge, information, media, and cultural productions, and allows individuals to interact at a distance from any other place, at any time. Moreover, connection and broadband make it possible to exchange files (information, data, and cultural objects) wherever you are: distances are either zeroed or reversed with the Internet. As a result, objects geographically and culturally distant approach and reenter our space, realizing, at least apparently, the metaphor of the "global village" that McLuhan had theorized long before the advent of the Internet.

The digitalization process changed the consumption process by the users and the production process by the artists. Nowdays is a common practice for artists to publish their tracks and videos on social platforms like YouTube, SoundCloud, Facebook, and so on (Barneva et al., 2021). But in a more sophisticated and futuristic way, the same "artist" changes its shape, leaving the physical body to move toward a holographic dimension, as in the Vocaloid experience or in the Meta-Verse (Nigam, 2021).

The diffusion of "liquid music" has also been enhanced by developing high-speed data exchange networks that allow files to be transferred quickly. Storing data on a physical medium is not more required, thanks to this acceleration in file sharing process: it is more valuable and convenient to leave it stored on the Network access it from any device. This power (and easy access to information on the Net) determines the so-called information overload, typical of the digital age. The possibility of transforming all the info into bits has made a large amount of data available to anyone, but it is unlikely that it will ever be fully consulted.

Thanks to dedicated software and a simple PC, it is possible to manipulate the fragments of a file (audio but also video), extrapolate them from the musical text, and, through a "copy and paste" procedure, reposition them inside new sound products. A creative process leading to the contamination and melting pot of different musical experiences. In a postmodern perspective, it redefines and recomposes already existing artistic material, determining new cultural paths. The most significant innovation is thus realized in the possibility, for

anyone, to create music without possessing any particular theoretical–musical knowledge. Today, thanks to dedicated apps based on deep learning, users could create new and realistic videos replacing the face and the voice of a person recorded. Digital editing allows editing audio and video with ease, offering endless combinations of editing to listener-artists, remixing and redefining the aesthetic material, which, in turn, contribute to the construction of individual and collective identities. As Bonini (2006) says, the reality is real only if it resembles the imaginary, producing audio and video material, starting from one's personal experience, meaning, above all, proving your existence. The creation of the individual compilation characterizes mixtapes and the playlist, the list of songs stored on an mp3 player, responds to the customization logic typical of consumer culture in which listeners control what to listen to what order at what cost. They liberated the user from record stores and radios in the same way that record stores and radios have freed previous generations from the imposition of being present at live music performances (Moore, 2004). The logic of the narration, at the base of every song, is completely redefined. It reworks with the help of images, as it happens in the video clips. Music and words take on new and different meaning through narration through images; in this way, a new product is realized in the confrontation between the author and user, putting in crisis and confusing the respective roles and that, above all, cannot be re-actualized twice in the same way.

The Net users find themselves, in a multitasking perspective, to be users, distributors, and creators of content, also musical. Such contents start from the category of user-generated content (UGC). This expression indicates the products made by the Network users, such as texts in blogs, remixed music, or videos on YouTube.

The technological revolution would seem to profoundly change our relationship with media, cultural products, and knowledge, as well as our approach to the preservation of media products and the organization of our home media libraries. By dematerializing the medium, digital technology allows (or, more correctly, provides the illusion of) a practically unlimited availability of material and favors the integration of sources and references physically distributed everywhere into a single "virtual archive", provided standard criteria are adopted. All this can be potentially made available to the world community through the Network and made accessible to all. However, digital archiving also undermines the intrinsic complementarity of content and physical support. The extreme ease of manipulating digital memories and the fragility of memory supports and the rapid obsolescence of the technologies that allow their "reading" and elaboration redefines the very idea of preservation to which we are semi-accustomed.

2. The rise of liquid music

Between the Sixties and Seventies, the diffusion of the cassette tape led to the possibility to personalize the ways and the places where people could listen to music. Audio recorders offer users the opportunity to make original and personal editing, pouring individual songs from other cassette tapes or the DJs into a new magnetic tape, creating factual "do-it-yourself" music compilations. The user can thus build his personal sound story, choosing the songs and their order to which s/he would like to listen. Through a simple domestic recorder, the user can decompose and recompose the order of the themes of one or more albums according to his or her taste. The "personal compilations" take on an enduring role in the active fruition of the listener who, following his or her musical tastes, can create a sort of sound narration of his or her own emotions and biographical experiences.

Thanks to audio cassettes, the user could extrapolate a certain number of songs from records of different artists and genres, lining them up, recording them, and, in the end, have in hands an original product: a mixtape, which was something more than a compilation. It was a "collection", a lifetime object, a way of seeing the world, a photograph of reality seen from a particular perspective (Assante, 2008).

Choosing contents and ordering of the tracks responds not only to commercial logic but also to the narration that the artist intends to propose. On the audience side, the listener can create a different, personal, playlist; change the order of the tracks and decide which and how many of them store in the tape. In both cases, the music remains a social narrative: it tells the stories of those who make it and is used by those who listen to it to decode their own story, both individual and social (Sibilla, 2008).

The music scenario of the Eighties opens with the diffusion on the market of the compact disc (CD), the digital support that took the place of analogic technologies. The changeover to CD breaks the direct link between the content (the sound) and its support. For example, listening to the vinyl record was characterized by the background rustling and dragging the needle on the grooves. That physical contact gave back that unmistakable background sound that was an integral part of listening to music: it became part of the listening process and stored in our memories. With the CD, the sound is transformed into a bit, a series of binary numbers, read through a laser. The music become numerically coded (Manovich, 2001). There is no longer any "physical" contact between a cartridge and a surface, no rustling. The laser reads the bits stored on the media and decodes them, playing the music track through high-definition audio speakers.

Until 2000, the absence of alternative economic technologies for home recordings had limited the decline of the audio cassette; then, with the advent of digital formats such as mp3 and, therefore, with the definitive affirmation of the iPod, music users quickly put the old magnetic tapes to sleep.

With the diffusion of the new media, music (to paraphrase Bauman, 2005) becomes increasingly "liquid", a stream of material information. Moreover, computer systems are increasingly becoming less complex in their functions and more user-friendly, bringing people to personalize not only their way of listening but become media-creator themself. Unlike audiocassette, the CD burner connected to the computer was able to create copies identical to the original; and the record of a personal list of music tracks offered new scenarios of active participation of the user, not only in the fruition but also and above all in the musical creation. The user can extract music tracks from a CD easily, break them down into small parts, and create new and personal artistic productions; recompose them and burn on a new CD. In the Nineties, the rise of the Internet promoted the diffusion of one's creations beyond the borders of the home. Metropolitan rappers quote Bach, rewrite him, and make him a sound background, a landscape of collective memory, drawing (sometimes unconsciously) from the pop music of the Sixties.

A new type of musician was born: one who is often unable to play any musical instrument but, using the sampler, computer, and a few other electronic supports, can create products of the highest sound quality in his home studio. Thanks to new technologies, music is increasingly within everyone's reach, even in the creative phase, when the artist seems to be a director who, instead of directing a group of musicians playing together, expertly arranges the skillful performances of musicians of different genres and eras (Reynolds, 1998).

The Era of the Bit has favored the evolution of what electronics had introduced into music through the synthesizer and, later, through sampling, a computer that converts sound into numbers.

In the beginning, it was mainly used as a "quotation machine", an instrument that could be used to copy segments of prerecorded music that were then played on a keyboard in the desired tonality and rhythmic scan. However, as the sound is converted into digital data through this operation, the information can be redefined. Hip hop, techno, jungle, to cite just a few examples and, in any case, the new electronic music, are "fed" by very short sound fragments that are "stolen": sampled from records already recorded, decontextualized, and then "re-played", creating new musical products in which the contours and identities of the original tracks are revealed.

The rhythmic loop of drums, bass, guitar, or even simply vocals become the basis of a new composition and, as Lev Manovich (2001) claims, the new

narrative engine of music. In the Digital Era, everyone can be, at the same time, an artist, a producer, or a distributor of himself.

These possibilities create a new type of user-artist, firmly integrated and multimedia, who uses the audio-video materials of h-is/er own sound experience to express h-im/-er self, also through the Web. Digital production activities increasingly represent the vehicle towards which individuals, in particular young people, assert their existence: "I transmit; therefore, I exist". The "cut 'n' paste" was the new rock 'n' roll: with it, you can move freely on the timeline (the new dance floor) "hip/do/mount" as you prefer, if to the rhythm of the music.

Peter Gabriel is one of the first artists who, using the enormous potential of multimedia technologies, through an interactive CD-ROM game, enjoyed feeding his "decomposed" compositions to fans, to be "recomposed" according to the taste flair and creativity of the potential user. Already in 1993, with the CD-ROM X-plora1, Gabriel, one of the leading proponents of the contamination between different forms of expression, proposes a multimedia reworking of his musical work, implemented with the help of movies, graphics, and the possibility of interaction; among the various options, the user can rework some songs of the musician. In 1996, in EVE, he created four virtual environments for four songs, each one designed by a contemporary artist; the exploration includes creating a video, reshaping both the audio and visual tracks. In the interactive game, the music tracks can be broken down, divided into many small sound fragments that the user can recompose as he wants, generating his own unique "composition" independent of the original song. Therefore, this sound product is the result of the interaction between the author's original idea and the user's intervention, who in turn becomes the author or co-author of the final composition.

3. New ways of sharing

Web-users not only share information but actively contribute to creating it, interacting with each other. They express their ideas and voice their opinions through blogs or different online forums; participate in the writing of shared information on wiki platforms; publish photos and videos within their network of knowledge, social media; and exchange information and their musical taste. Not surprisingly, music products are among the main drivers of digital sharing. The practice of file sharing is spreading significantly at the turn of the millennium, with the birth of the mp3 compression system and the production of the Napster software. Subsequently, users continued to download music legally or illegally from the Internet and buy it in digital music or traditional

stores. Bands such as R.E.M. and Radiohead, or artists such as Peter Gabriel, just to give a few examples, have identified new forms of market, allowing to download the songs behind free donations or with the presence of advertising before and after listening, as in radio or TV; or, again, coming live performances, videos, backstage, and other "niche" material (Sibilla, 2008).

In addition, digital technologies increasingly allow do-it-yourself audio-video reproductions. In this regard, it is interesting to note that there is an increasing number of small, acutely lit performances in the audience during any pop music concert, supported by the arms of the audience. The lighters, which the audience used to use as a sign of participation and sharing during a live performance, have been replaced by the flashlight on the smartphones or the screens through which users can spread the performance and stream it live to their social circle of friends and more. Users can play a personal version of the artist's concert they attended and, through sharing programs, broadcast it on the Web. The same event is, in this sense, represented by multiple audio-video fragments, each of which tells a particular and point of view of the exhibition, which makes every single shot unique.

With the spread of streaming technologies on the Internet and simple software, users can also create their radio station and accessible to non-experts. As happened in the 1970s, with the so-called "free radios stations", but the Web represents a more accessible and cheaper way to broadcast music and words, at least initially and/or "free" from commercial or editorial logic.

As it happened with other media, radio is also undergoing an essential process of convergence. It is the primary mobile tool, integrated into music players, mobile phones, and – with the Internet – in any type of device. MP3 players were already on the market at the end of the Nineties. Still, the marketing investment made by Apple, as well as the proposal of a particular design that would make the player also aesthetically pleasing to "wear", and the fun to listen to, has contributed to make the iPod the digital music player par excellence. Its technology has also enhanced the hybridization between the radio and the Internet through the birth of the phenomenon called podcasting (Bonini, 2006)

Through the iPod, the apex of listening personalization is finally reached since the born of the gramophone. But the iPod is not only a "music player": it allowed the reproduction of texts, images, sounds, and videos. The convergence of the media, as Henry Jenkins (2006) recalls, is not only the union of several instruments in one but, above all, the fusion of several media.

The artists themselves have adapted their websites to the new "trends", offering fans the chance to buy songs and albums online directly, expressing a confident trust in the Net to promote their activity (Madden, 2004). The practice to improvise live performances directly (or through the audience's collaboration) on social channels is becoming more popular.

The Net is also particularly effective for promoting musicians who are known to the public through the pages of specialized social networks. In the same way, emerging artists share their musical productions online, singles, or complete albums, under creative commons license: they do not ask for any compensation from those who want to "share" this or that music track. The participation from below, typical of the Net, has also manifested through the phenomenon of smart mobs already described by Rheingold (2002). As in modern Woodstock, users meet on the Net and then find themselves in the streets or squares of a city to dance. This confirms music's ritual function and aggregation, socialization, exchange, and cultural participation.

According to Jenkins (2006), convergent culture favors "trans-medial narration", a new narrative form that uses different types of media and media platforms and contributes to perfecting and integrating the user experience. By conveying unique and distinct information, each medium contributes to the story's development and the understanding of the narrated world. Using different formats and media helps create "entry points" through which the user can fully immerse himself in the narrative. Then the user is called upon to reconstruct the overall meaning of an integrated work of art in various media. Jenkins highlights two prominent factors that drive transmedia communication: the first is the proliferation of new media, such as video games, the Internet, and mobile platforms with their applications. The second is the economic incentive for media creators. By sharing assets, users can lower production costs. Cross-mediatic narration often uses the principle of hyper-sociality through story creation practices even by people who do not directly deal with the original production. This concept is combined with cross-media, which refers to the forms of communication that pass through different media. Cross-media promotes the integrated, multiple, and transversal dissemination of content and services, with mutual contributions from various production and distribution chains and the involvement of an indefinite number of creators and distributors. It is not the interpretative cooperation of data but a productive collaboration of content. The cross-use of the media completes the information. Cross-media is a television broadcast that interacts with the public using the blog and reading live comments from home. Cross-media is the radio announcement that links to the website to deepen the information and download data. Transmedia narratives and cross-media increasingly nourish the pop music and bit culture of the third millennium.

4.   User generated music

At the end of the 1990s, thanks to the diffusion of digital technology, the telephone also underwent a significant technological evolution. From an instrument for telephoning from a fixed location, it first became a portable device and then a sort of "digital telegraph on the move" to transmit short text messages. It then rapidly became a real pocket computer with the possibility to reproduce photos, sounds, music, moving images, radio, and television transmissions, collecting the bytes of the Net in the palm of your hand. The mobile phone thus becomes the leading example of "technological convergence". Raymond Williams (1981) used this expression in the 1970s precisely about two social phenomena emerging in those years: on the one hand, the trend towards the mobility of individuals with the growing interconnection of places; on the other, the development of increasingly autonomous domestic units. Although they were contradictory, they were closely connected and characterized the forms of life in industrialized countries throughout the 20th century (Jedlowski, 2003).

According to Meyrowitz (1985), electronic media has determined the social changes that led to the advent of tribal behavior (Bonini, 2006) within that "global village" where all the cultures of the world are connected.

In addition, unlike the traditional home phone, with its indistinct trill from device to device (subject to minor variations, always standard), the mobile phone offers the possibility of setting any sound to replace the trill, a unique sound, as a distinguishing mark, to be recognized. When you receive a message or a phone call, you can hear instead of the familiar beep, the sound of a dog, a stadium choir, or Lady Gaga's latest hit. Whatever is audible becomes a ringtone in a catch (Madden, 2004) that leads to particular and original sounds. From this point of view, the recording industry seems to have found new sources of income. At the same time, humanity appears more and more "immersed" in what Derrick de Kerckhove defines as "tertiary sensoriality" (Buffardi, de Kerckhove, 2011): it is an electronic orality, and it is based on the simulation of sensoriality rather than on its transmission. Through, for example, the 'beep' of mobile phones or computers, tertiary orality is characterized by a tactile language that gives feedback to our actions in a sort of organic simulation. Rather than "orality", it is, in fact, more appropriately, a "tertiary sensoriality". The digital items, on the computer screen, can be compared with mental objects. If the television screen, offering a frontal relationship with the viewer, has inaugurated the mass culture, the computer screen (introducing two-way interactive modes) led to "total immersion", initiating a new "culture of depth". An expression of this form of culture is the "virtual reality", which allows us to

enter the world of video and computer games and probe the infinite depth of human creativity in science, art, and technology.

Tertiary sensoriality is connected to the logic of immediacy and of hypermediation of new technologies. Proximity allows the viewer to feel that the medium disappeared, and the objects are before his eyes: a sensation that defines the experience as "authentic." In the epistemological sense, hypermediation corresponds, instead, to "opacity", that is, the awareness that that knowledge of the world reaches us through the media. The experience of the medium becomes itself an experience of reality.

The connection between man and the media is characterized by a solid social and cultural component expressed in new consumer trends. Silverstone states (1999) that all communities are "virtual communities" and that there are different degrees of sociality within each community linked to the level of interaction that the media offer. The expression and symbolic definition of community, with or without electro-media, has been recognized as an essential condition of our sociality; communities are imagined. We participate in them with or without face-to-face relations, with or without a physical connection. This is a topic that needs to be further investigated due to the introduction of new virtual environments as the Metaverse (Clark, 2021).

The clearest example of this creativity which, paraphrasing de Kerckhove, we could define as "connective", can be found in the analysis of YouTube, the most popular video portal on the Internet. Founded in 2005 by Chad Hurley, Steve Chen, and Jawed Karim, YouTube has positioned itself in a few years as the archive of the "visual knowledge" of the world, so much so that it was purchased in 2006 by Google, the leading search engine of the Web. Its initial motto was "the archive of your digital videos", offering users of the Web a space to deposit their audiovisual memories. But the explicit reference to television (tube is the cathode ray tube) could not distinguish the type of videos uploaded by users. It is no coincidence that many of the videos present are taken from traditional television programming, that is, scenes from films, TV series, variety shows, cartoons, and music videos. In addition to these productions, there are also amateur productions, in the perspective of the so-called User Generated Content (UGC): from the video dedicated to one's partner to the personal video-blog, through which one can express one's opinions; or the creation of remixes and montages of other visual products.

Just as MTV has been for television, YouTube soon became a place to merge images, music, and words, through which to tell a story or spread a message, in the time of a video clip. YouTube is no longer an ordinary archive, but rather a tool where you can "produce yourself", as its new motto - Broadcast Yourself - says. The individuals put themselves, their face (like on Facebook), their identity, or, simply, their technical and artistic skills back into play.

Moreover, the Net allows to break down spatial boundaries and, therefore, it is possible, through YouTube, to create a music band with artists coming from different places and contexts. Each musician video-records his contribution, playing his musical instrument, which is then reassembled as if it had been performed at the same time and in the same place.[1] This particular use of the Internet and YouTube as a "global" artistic community has determined, among other things, the professional creation of the first Symphony Orchestra of the Net[2] a "global music village", where the individual can express himself and participate, connected to other individuals, in building an original and innovative, unprecedented product.

All this shows how the transition from analog to digital media is marked by significant changes in production, sharing, and enjoyment of culture. And this brings us to remember that artists usually respond creatively to new technologies (Stokes, 2004; Solis, 2017; Shelemay, 1991; Zemp, 1996).

The ease of creation process has boosted the number of innovative products available on the market. For that reason, new and complex algorithms have been developed to allow a better circulation of these products to the broad public. In a platform like Spotify, one of the leading audio streaming and media services providers in the world, several technics are used to "suggest" and "recommend" music to the users (Hodgson, 2021). First, the system analyses the way users interact with the content on the platform: if they skip a track, save to a playlist, visit an artist's page, and so on. This is called "collaborative filtering". Or audio analysis is conducted over the audios to catalog the tracks by tempo, dynamics, BPM, genre, etc. In this way, the community feeds itself on this platform (Spotify, YouTube or Amazon) and shares opinions expressly or not. As an idea, a behavior or a style became a "meme" on the Web, after a widespread, in the same way, musical tastes are shared and mutually influenced.

People use daily social media as a place where they express their identity or performance differently than in private, following Goffman's (1959) dramaturgical metaphor. As part of Youth Culture, the social platforms help people enforce their autonomy over lives, express new identities, and build support networks with other users.

TikTok is one of the more recent apps that became famous thanks to the fusion between UGC and Music. It is a social media app, that in February 2021, registered over 1billion of monthly active users[3]. The platform, mainly used by teens and 20s (Influencer Marketing Hub 2019), allows users to create short video content integrated with short clips of popular music. Some users become

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[1] www.youtube.com/watch?v=tprMEs-zfQA
[2] www.youtube.com/user/symphony?blend=2&ob=1&rclk=cti.
[3] https://wallaroomedia.com/blog/social-media/tiktok-statistics/

popular, as in other social media, producing creative and innovative content, combining video, music, text, and body movements (Toscher, 2020). New artists are born thanks to TikTok, as Megan Thee Stallion, Conan Gray, Doja Cat, Sam Fischer (Adetoro, 2020; Fiorentino, 2021).

5. Hybrid experiences

At the beginning of the Noughties, Yamaha Corporation released a new computer application that permits the synthesis of human signing. It was called Vocaloid, and by it, users can input a melody and lyrics, and the software will generate a sung vocal line. Designer to enable professionals to produce vocal tracks, the program permits the manipulation of rhythm, pitch, dynamics, timbre, breathing, and have realistic results. As is usual, since the Digital Era, the worldwide community of amateurs used Vocaloid unexpectedly, collaborating on writing and composing, making musical arrangements, dance routines, and animations.

As Riki Tsuji, Miku's live-concert coordinator, says, "Hatsune Miku is, first and foremost, a software for making music. Anybody can buy Hatsune Miku software, and using that software, they just type in lyrics, punch in a melody, and the software will sing the song. When the software was released, people started making their original songs using the Hatsune Miku voice, uploading to music-sharing sites. It started this chain reaction of creativity".[4]

The audience around the Vocaloid phenomena has grown in the following years until in 2019, more the ten thousand people had participated at the first Vocaloid-holographic concert in Shanghai[5]. Two virtual singers, the Chinese Luo Tiany and the Japanese Hatsune Miku, performed live on a physical stage while the audience was dancing and singing, participating in the virtual performance as the artists were humans. The show merged the synthesized voice created through Vocaloid with holo-3d animated characters. The phenomena of Hatsune Miku was so natural that some years before, the hip-hop and rapper Pharrel Williams collaborated with her in the song "Last Night, Good Night (Re:Dialed)". And other Japanese artists also influenced their virtual colleagues. The virtual artist is a new frontier for the entertainment industries that can use AI to create voices and bodies, assembling them on a hybrid exhibition without the risk of making some mistakes due to stage improvisation. But it is also a new way to allow the audience to customize their

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[4] https://www.washingtonpost.com/entertainment/music/this-singer-is-part-hologram-part-avatar-and-might-be-the-pop-star-of-the-future/2018/07/05/e2557cdc-7ed3-11e8-b660-4d0f9f0351f1_story.html
[5] https://www.globaltimes.cn/content/1158741.shtml

artist due to its digital shape. Actually, the attention of the wide and crossmedia audience is focused on this merging process between real life and virtual reality. In September 2021, the broadcast Fox (Fox2Detroit, 2021) announced the world's first avatar singing competition. In Alter Ego, that is the name of the "reality" show, contestants perform not as themselves but using a custom digital avatar who will reproduce their performance via motion capture technology. The following month, Mark Zuckerberg, founder of Facebook (2021), has announced new investments in the Metaverse, a virtual place accessible by a dedicated headset called Oculus. In this digital environment, people could create a custom avatar and interact with several spaces and activities: manage a job meeting, watch a movie with other people, play games, and, of course, attend a music concert. The scenario that we could see in the next years will probably be the born of new meta-communities where people will produce and enjoy cultural content directly in a digital dimension made by bit (van der Merwe, 2021).

Other artistic performances are realized in a different and less addictive way thanks to several mashup techniques based on deep learning. Commonly defined as "Deep fake videos" or "synthetic media", they have risen to international prominence thanks to two unaware, famous characters. In 2017, the artists Bill Posters and Daniel Howe created a range of deep fakes thanks to the Artificial Intelligence technologies to explore the dangers of the Digital Influence Industry. Their project, called Spectre[6], consisted of realizing some provocative videos where celebrity influencers as Mark Zuckerberg, Donald Trump, Marina Abramovic, or Kim Kardashian speak in video words that they never pronounced in real life. Starting from a video recording, by the algorithms, the movement of their mouth is adapted to fit on the new sentences that the artists decided[7]. In this way, Zuckerberg speaks about the fear that someone could steal personal data from people in the future. A more complex algorithm could also replace the voice through a similar process. Replace faces and voices, but also the body movement (Siarohin, 2020).

The deep learning base of these experiments anticipates how we will consume artistic products in the next future. We could define it as a "hybrid experience", where we could stay in a concert and loudly sing while a holographic 3d representation of the artist is on the stage. And the artist could be existing somewhere or only the effect of digital creation.

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[6] http://billposters.ch/projects/spectre/
[7] https://news.artnet.com/art-world/mark-zuckerberg-deepfake-artist-1571788

6. Feeling the bit

Technologies such as the Walkman (late 1970s), Web (late 1990s), and iPod (early 2000s) represent the point of "evolution" of previous media (Bolter, Grusin, 1999), determining significant social effects and offering (in different ways) new sociocultural opportunities to its users. They redefined the boundaries between the public and private spheres and promoted new ways of sharing social processes.

The technological progress of the 20th century first leads to an exteriorization of the motor brain, followed by the exteriorization of cognitive functions through a series of applications that develop an increasing hybridisation between man and machines. Among the different technological prostheses of human organs, the computer represents the amplification and extension of the mind that produces the exteriorization, acceleration, and sharing of cognitive processes. About this point, de Kerckhove states that the exteriorization of the individual on the screen offers the possibility of sharing the cognitive content with other people (Buffardi, 2004).

The connection between people's thoughts and their cognitive forms represents one of the most significant elements that characterize the fusion of new technologies. In front of the computer screen, the "connective" condition represents the possibility of reaching a shared elaboration of thought itself through its externalized and interactive interpretation. The "connective thought", according to de Kerckhove, is the cognitive product that arises from the interaction between individuals, and as such, begins with a conversation and already characterizes oral societies. Through new means and, in particular through the Net, however, it takes on new ways. The connectivity attributes a form of thought between individuals to the word and thought becomes a "digital object."

Moreover, reiterating the lines of continuity between oral society and the digital age, de Kerckhove highlights how "modes of thought" can be traced back to the different instrumental and technological endowments of different eras. The "hypertextual thought" of the Web is an "ancient thought"; it recalls our mental associations, arises from the conversation and interactions between subjects, translates and explains the necessary links among events, situations, and information. However, electricity and modern technology can express a new "essence" of the individual. For the scholar, the "extended real time" of the Network is a significant dimension. With this expression, de Kerckhove means the "time of thought," similar to the "time of connective thought." The time of thought extends through the decoding of new information. It can be suspended, interspersed, and interrupted by other activities and ideas, to be resumed in several stages until the information processing is closed. In the same

way, though on the Net acts in an "extended real time" in a shared working process.

According to de Kerckhove, connective thinking and the concept of community represent the core of the reflections on the "new digital being." The electronic communities that arise through collaborative software are formed around a shared project and represent a "just in you" community, in passing, that exists when a connection is made around the objectives and then dissolves or changes. It is a cognitive community because it reflects the cognitive character of the Net, based on a matrix of connections between elements, objects, concepts, and thoughts.

Comparing the different researches at an international level, what emerges significantly is the active role that Network users have assumed in the last decade. It is not a coincidence that we dwelt on the phenomenon of UGC, emblematically summarized by the cover of the Time on the "2006 season": "You control the Information Age. Welcome to your world".[8]

It is "we" the users, who control the Information Age. Each user of the Network can enter their content on the Web and share it with others. Discuss and participate collectively in building shared knowledge pathways. However, at a closer look, it is also evident that the scenario is not as "democratic" as it might seem. In addition to the widespread digital divide, there is also a participation gap (Jenkins, 2006) that is, the lack of rights of expression (due to governmental controls) or the impossibility (due to economic issues) to make one's "digital voice" heard. Such difference is intergenerational and, above all, intragenerational; they involve different levels of participation in the Network. Several people who use the new media, surf the Web, interact, and create content are joined by individuals who do not access these technologies and, therefore, do not participate in the process of "connective intelligence" expressed by de Kerckhove. Consequently, beyond the emphasis that characterizes the leading theories on the Web, McLuhan's (1964) "global village" metaphor seems not to be definitively fulfilled. Moreover, the current scenario poses new and necessary reflections on the forms of economic, political, and social power connected to the development of new media, just as studies on cultural hegemony and the influence of the mass media have already contradicted the theoretical analyses of the last century.

Hence, the user is the only one that owns the power over the Information Age, as shown on the cover of Time. In practice, the individual creates and feeds the contents, which become consultable and navigable only through the societies that manage the Web. If YouTube sees itself, for its initial mission, as an "archive of our memories" and Google as "gateway" and content indexing,

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[8] http://content.time.com/time/covers/europe/0,16641,20061225,00.html

such portals could decide to sell, close, give up, disperse, or delete the immense cultural heritage they keep online; at any time and for different reasons: economic, political, social, ethical, and cultural.

The leaders of the social and technological transformations underway are, without any doubt, the "digital natives" (Prensky, 2001; 2009), young people born between the 1980s and 1990s and who grew up in the digital flow, in the transition from analog to digital technologies: the "Bit Generation" (Savonardo, 2020). With this transition, the "digital immigrants", that is, the older generations, who understandably have more incredible difficulty approaching the new technologies, are challenged once again.

For music, and in general for artistic creation, besides the changes determined by new technologies, it is essential that de Kerckhove (Buffardi, 2004) has defined "the art of intelligence", which is the art of setting the proper configurations of connections in the Net. This is a form of art; it is a new art medium. Connection and community represent two forms of art today that need to be developed and understood: the art of connection (the art of software intelligence) and that of community (Frith, 1988).

During the last century, radio, television, computer, walkman, mp3 player, mobile phone, and car stereo (mobile extensions of the domestic dimension) have determined sound crossings, in time and space, contributing to the "musical construction" of personal and collective experiences and memories. Individuals of any generation are immersed in sound, feed, and consume it in a continuous redefinition of their identities.

Music contributes to the processes of the social construction of daily experience in which the subject is constantly immersed with the body, affections, and action. This experience is mediated by a multitude of its natural and mechanically reproduced. Most of our daily activities are accompanied by a sound background. Waking up, walking, driving, working, and sometimes falling asleep with music or other acoustic accompaniments is, for most of us, a family experience, a constant. As well as the noise recurs in our urban and, sometimes, domestic context. We relate to space and time through our personal use of sound, live to the rhythm of the music in domestic areas, and sit in the street listening to our favorite songs on traditional walkman headphones or portable digital players. We experience constant sound crossings. The polyphony of sound regulates us and is regulated by us to an increasing extent as we move through everyday life (Bull, Back, 2003). Among the different media, radio is the most pervasive; it potentially accompanies every moment of our daily life. It is present in every place: in the kitchen, shower, car, on the beach, at the park, in the office, and, through the web radio, on our computer, while we write, read, and navigate. Jo Tacchi (2003) writes that the sound of the radio is intimately integrated into everyday life and can be understood as an

essential part of domestic environments or sound landscapes. Sound is endowed with meanings and implications that go beyond the house's immediate context and physical boundaries and can create a plot within which one can move and live. This sound can be interpreted as a mediator between people in the domestic context and the outside world. The experience, activity, and meaning of radio listening in different contexts create bridges, intersections between the personal and public dimensions, and connections through time and memory, playing a connecting role between individuals and groups of people. We can get a sense of community through listening to it and, temporarily, draw on memories, nostalgia, emotions that do not need to be rationalized or verbalized. They are lived as an aspect of everyday life as it flows and is more than a single memory or a single connection.

Music connects us and, as Schütz (1951) argues, allows a mutual agreement in a relationship. The forms of identification in an "us", the sense of "being together" that, for Adorno, refers to the eclipse of direct experience caused by technologically mediated forms of knowledge, allows us to be alone and simultaneously "together" through sound reception. With the diffusion of mobile phones, walkman, mp3 players, analogic and digital radios, and the Net and the ubiquitous car stereos, the nature and meaning of being tuned or connected require an increasingly in-depth scientific analysis and reflection. With a multidisciplinary approach, within the sociology of cultural and communicative processes, and the study of late or post-modernity technologies.

The digital universe's sounds, rhythms, and modes of communication increasingly undermine the boundaries between private and public space, between the domestic sphere and the street, between the individual microcosm and the global agora. New sound technologies provide us with all the sound we want. Michael Bull and Les Back say that domestic sound devices allow us to recreate the cinema in our living rooms thanks to the advent of digital sound systems with enveloping sound for our television sets. Home hi-fi systems have already achieved this for our favorite sounds (Bull, Back, 2003). Customization and individualism have increasingly divided the spaces in the home into multiple listening (and viewing) modules. However, sound does not respect space. Thanks to media, it goes through walls, geographical, and cultural boundaries.

Carmen Leccardi (1998) argues that if modernity has dissociated space and time, creating a global presence that can be traveled quickly, late modernity has destroyed the last space-time frontiers by creating a "global contemporaneity" resulting from digital technologies. Thanks to the diffusion of the Net, it is possible to "be" in different points of the planet without crossing material spaces, in a new "geography of the impalpable".

Vinyl records, audiocassettes, CDs have given way to digital players that can contain thousands of music files, but not only those. Furthermore, the

necessity to store data is decreasing on a material medium: it is more valuable and convenient to leave it stored on the Net and access it on any computer. Liquid music, therefore, for a semi-liquid society.

The possibility of transforming all the information into bits has put an enormous amount of data at anyone's disposal, potentially infinite, which, however, will never be fully consulted.

Moreover, Lévy (1997) points out that you don't "expose" a CD-ROMs or even a virtual world: you must navigate, dive into them, interact with them. Digital technologies require the active involvement of the user, the conscious participation of his memory in the constitution of the message.

The introduction of digital technologies radically changes the relationship between the artist and the creative process. Technological tools such as the pioneer camera, computer, and multimedia systems influence artistic production, which is increasingly expressed through the contamination between different languages and codes. We are witnessing the birth of a generation of musicians–composers who give life to new forms of expression through a musical language that goes beyond words, sounds, and images, in the process of interactive and multimedia communication. The contamination between different languages is nourished by the cultural melting pot that is also expressed through the global citizenship of some music bands, whose artistic production is, at the same time, the daughter of no place and all places, of an indefinite space-time dimension, of the appropriation of a glocal dimension, in which the boundaries between local and global are increasingly blurred.

Some musical genres and forms, according to this theory, reproduce the rhythms and cadences typical of machines and means of transport, such as, for example, "the rhythm of the train", of the "locomotive", which recalls not only "the beating of the heart2 but also "blues music". For de Kerckhove (2004), jazz breaks the "mechanics" of rhythm.

The linguistic and cultural forms of new media result from a fusion between the computer logic of the computer and the cultural level of the press. In his book *Software Culture*, Manovich (2013) says that contemporary culture is increasingly expressed through digital programs that allow us to create, reproduce, and redefine the same cultural objects we interact with, that belong to us, that we share and inherit. Software represents today, in an increasingly pervasive way, our interface with the surrounding environment, with others, with individual and collective memory, and with imagination. A "universal language" allowing the world to communicate, a "universal engine" that allows the world to move. The different systems of modern society speak other languages and pursue different goals. Still, they all share the syntax of the software that allowed the birth of the global information society. It means that the other disciplines of contemporary society and culture (from the humanities

to science, art studies to technology) cannot ignore its role and effects. Software culture (continues the new media theorist) is an essential component of social living because ours is unequivocal, "a software society immersed in a software culture." This consideration also applies to music production and enjoyment. Sibilla (2008) points out that software also contributes to building cultural and linguistic interfaces that determine musical production and fruition, modeling digital music's language and social forms.

The new digital technologies and their use place an issue, and sometimes overturn, about the aesthetic categories and traditional artistic canons and our daily interaction modes. Thanks to YouTube, the home computer turns into a video jukebox of memories, a shared digital space, cultural, and musical memory always accessible and usable by everyone, always on. Our sound archive (made up of vinyl records, audiocassettes, CDs, and music videos) is enriched by the files available on the Net, a window on the world, and an extension of our senses, increasingly connected to other eyes, ears, and memories. With digital technologies and file sharing, each of us can customize and enrich our home media library according to our tastes and preferences. However, the process of personalization of listening does not originally belong to the digital culture. Still, it can be traced back to the mixtapes of the analog Era since it was first created.

The creation of mixtapes, compilations recorded on magnetic tape (and the storage of specific files on an mp3 player) responds to a logic of personalization that belongs to a relevant aspect of contemporary consumer culture. In a significant way, a practice that emphasizes the role of music as a narrative, individual, and conscious. It narrates the loves, pains, enthusiasms, disappointments, passions, political commitment, the collective spirit of significant historical, social, and cultural moments experienced on "one's skin", also through the sound and words of certain songs. Verses and music that has accompanied entire generations have represented the soundtrack of youth cultural events of the last sixty years, from the advent of rock music to the present-day sound paths, traces of life.

The mixtape, replaced today by digital playlists, stages a unique combination of cultural products and biographical experiences. This practice emphasizes how in the contemporary world, one of the aesthetic material's primary functions consists of the continuous composition and decomposition of individual and collective identities. According to Thurston Moore, a mixtape represents a particular form of poetry. The new poet collects and recomposes memories, lived experiences, fragments of memory by staging his own identity. No mix comes by chance (Moore, 2004).

Audiocassettes and their portable recorders have brought about other significant changes, making music consumers "mobile". The walkman, the ancestor of modern mp3 players, revolutionizes traditional ways of enjoying

music. According to Bull and Back, the Walkman is the emblem of urban personalization technologies since it allows users to build their sound world wherever they go. At last, the introduction of Vocaloids permits the genuine creation of an "artist" with their lyrics, body, and exhibition.

But, as previously discussed, the old media are not dead. On the contrary, they are re-mediated technically in new devices and culturally for new uses. This is the case of the vinyl records that became the first recording format to return from extinction (Mall, 2021). That is happened thanks not only to nostalgia movements but also because they never left the market, continuing to be used by DJs, club culture (Bartmanski, Woodward, 2015), and new. Some born-digital consumers refer to their love for vinyl records as a curiosity for a new world they never knew existed (Wohlfeil, 2020). This case represents a so-called process of retro-technologies (Sarpong et al., 2016) that involved other technical and cultural products from the past, as the phone Nokia3310, the Game&Watch devices, or tv-series and movies.

The rise of digital and, recently, virtual technologies bring user experience "aestheticized", and the world becomes what the user wants it to be. The iPod changed the territorial structure of the city in a double movement of "deterritorialization and re-territorialization" and the human brain frame. New changes in cultural – and music – production and consumption are expected due to the introduction of virtual and augmented reality. Through this process, new thresholds, nodes, and configurations are created. Although it is true that "my home is where my sounds are" (Bull, Back, 2003), the new sound experiences will redefine the boundaries of our virtual house.

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