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TARGETS OF MUSIC INDUSTRY IN THE CONTEXT OF DIGITAL TECHNOLOGIES: A SHORT REVIEW

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Abstract

The object of this paper is to set grounds for future research in music business by carrying out scientific literature review analysing music industry from global economy perspective. Since technologies are sensitive to time a time frame for the research was set from 2020 until 2022. Only articles in English and Lithuanian were analysed. In total there were 75 articles used for the basis of the research in “Web of Science” database. According to their content, these articles were categorized into 5 sections: ICT (information and communication technologies) and neural networks; New business ventures; Creativity and education; Intellectual property rights and blockchain technology; Digitization, streaming. Research of scientific articles was a result of a compound search of keywords music industry and technologies. In order to widen the search keywords were used with a logic operator “or”. Scientific review of the articles showed that technologies affect the music business in these areas: lessened limitations, satisfied customer needs, digital economy force, overtaking old systems, collaboration, staying relative and creative, fighting against homogenization, digital education, increased safety and security, increased financial gain and market share, autonomous and transparent intellectual rights, eliminating piracy, content accessibility, artistic relevance. In order to carry out representative and valid research in music business, more research has to focus on the global aspects of how this industry operates. This article is a steppingstone in that direction showing which aspects of the business are discussed at the moment thus enabling other scientists to start narrowing the gap and provide more in-depth research. The findings suggest that research towards providing solutions to music industry participants on how to effectively deal with fast approaching technological advancements is necessary.

KEYWORDS: music business, music industry, technologies, technological advancement.

Introduction

Music industry is a complex notion the definition of which depends on researchers’ comprehension on terms music and industry separately. To provide an in-depth view, this article analyses music industry from global economy perspective. There are 4 economy sectors which further subdivide into 1 678 industries where music industry is not listed as one. This is due to fact that music industry is an umbrella term that incorporates such industries as music publishing, digital music downloads, online music instrument sales, arts, entertainment, and recreation and many more (IBISWorld, 2022). The broad industry historically has undergone several crises which were brought upon by technological advancement. In 1999, internet-enabled audio downloads changed the way music is consumed, later, data streaming and new digital platforms as YouTube, Spotify hit record companies once again (Pallotta, 2020). To prepare for Industry 5.0 and to be able to face future technological challenges it is essential to understand how music industry participants are dealing with technological advancement and which areas are gaining momentum. Thus, the paper aims to identify current research being carried out in the music industry. For the purpose, a short literature review was chosen as a method.

The paper consists of the following sections: a context of the research, i.e., presentation of music industry and technological development concepts, methodology and materials, research results. Finally, findings of the

scientific literature review are summarized, and further research perspectives are drawn.

Theoretical background

A term music industry is combined of two words which separately present distinct notions. Godt (2005) researched different approaches to defining music and suggests understanding music as a “humanly organized sound, organized with intent into a recognizable aesthetic entity as a musical communication directed from a maker to a known or unforeseen listener, publicly through the medium of a performer, or privately by a performer as listener” (Godt, 2005). Industry is perceived as “any grouping of individual manufacturing businesses which is relevant when we study the behaviour of any one such business” (Andrews et al., 1993). However, the definitions presented above have their limitations, and does not reveal the concept of the music industry because an industry's development can be analysed by time-frame sections (Xu et al., 2021) while it is not appropriate for the music industry. According to Xu and others (2021), industry covers five periods which the last one, so called Industry 5.0, complements the fourth industrial revolution. Music, on the other hand, can no longer be researched without addressing “complexion of our processes of production, consumption, and, importantly, discourse amidst new, global order of digital connectivity” (Clarke, 2018). Due to the fact that terms industry and music itself do not have a concise universal definition, providing a definition of

music industry requires an understanding of industries in general.

First and foremost, economy is made of four sectors (Kenessey, 1987): primary (utilization of earth's resources), secondary (transforming raw materials into products), tertiary (production) and quaternary (knowledge-based activities). Other authors distinguish a quinary sector (consists of high-level decision making) as well (Thakur, 2011). However, North American Industry Classification System presents 14 sectors (Statistics Canada, 2021). In the United States 30 sectors are distinguished, which are then further subdivided into 1 678 industries (IBISWorld, 2022). Even though classifications vary, none have a listing under the name "music industry". This can be explained by looking at the music industry as a collective unit made of different sections. Applying terms music, audio, instruments, production, events and performance additional 22 music industry subsections have been found.

Table 1. Sections of the music industry

Sections of the music industry	Subsections of the music industry
Section 1 Sales, distribution and production	Musical instrument and supplies stores, audio and video equipment distributors, musical instrument rental services, independent label music production, audio and video equipment manufacturing, major label music production, musical instrument repair services, sheet music publishers, audio and visual equipment rental, music publishing, online audio equipment sales, the retail market for musical instruments, audio production studios
Section 2 Digitalization	Music streaming services, digital music downloads, online event ticket sales, online music instrument sales
Section 3 Arts	Arts, entertainment and recreation, performers and creative artists, musical groups and artists
Section 4 Education and promotion	Private music classes, concert and event promotion

Source: the authors' compilation according to (IBISWorld, 2022).

Table 1 verifies that the term music industry incorporates other industries. However, the industries are more intertwined than Table 1 can show. For example, if we look at section 1 we see that online audio equipment sales are categorized in the same subsection as audio and video equipment distributors. Both of the subsections are associated with the section 1 – Sales, distribution and production. However, online audio equipment sales could be also classified as a subsection of category 2 - Digitization. If the equipment sold would be purchased by a music school, this could then also be put in section 4 education and promotion. Another example of close

relationships between subsections and sections can be made with section's 3 subsection entry musical groups and artists. If the said entry was to perform in schools and carry out educational programmes, they could become a part of section 4, if they choose to upload their connect to streaming platforms, they then can become a subsection of section 2 (IBISWorld, 2022). Thus, combining subsections, but not putting them into separate categories, i.e., following traditional parameters of categorization seems a more accurate way of researching the music industry.

To sum up, complex nature of defining music industry spreads amongst other art fields as well which verifies Clark's (2018) notion that production, consumption and technological environment are important factors when addressing, researching or working with arts. Furthermore, these intertwined relationships between subsections of the music industry support H. Tessler's research where he views the music industry as a transformational process not a consumerism model based on sales (Tessler, 2016) and explains J. Sterne's claim that music industry is a combination of industries "whose activities directly affect the performance, production, circulation, consumption, recirculation, appropriation, and enjoyment of music" (Sterne, 2014). Moreover, it is underlined that music education complexity differs from other subjects and the approach of it has to be broader due to such distinctive features as content, methods etc. (Pan, 2014). To explore the aspect of collaboration in music business "motivation for partnership, the respective industry infrastructure and state cultural policies" as well as countries' where the collaborators work at markets have to be researched separately and globally (Um, 2019). New intellectual property models based on blockchain technology provide the industry with solutions that require IT and engineering skills as well to be knowledgeable in legal matters (Kapsoulis et al., 2020; Khan & Shahaab, 2021), thus, case studies in music industry support the notion of complexity even more.

Music industry, which includes phonography, concerts and performances, and the publishing sector in 1999 experienced its first shock with internet-enabled audio downloads (Szymkowiak et al., 2020). The second wave of recessions hit record companies with such technological developments as data streaming or new digital platforms as YouTube (Pallotta, 2020). Currently, slowly reactive music industry is still recovering from technological innovations and experiencing new ones. It is estimated that in 2023, its revenue is expected to increase by 43% compared to 2014 (Götting, 2019).

Lithuania Depending on the average national wage and population Spotify's monthly subscription range from 0.87 USD to 23.14 USD (Vahid, 2022), whereas artist pay-out varies from \$0.003 – \$0.005 per stream on average (Carter, 2021). Musicians who have granted their song rights to Spotify receive 1\$ for approximately 300-400 streams depending on where they live (Jacob, 2021). Moreover, if the artist does not have a wide audience, it is likely that their songs will not be offered or will be offered infrequently by the Spotify algorithm. Despite the fact that some well-known artists have removed their songs from Spotify, claiming that their policies are opaque, this has not reduced the revenue and power of the market leader,

on the contrary, the consumer base has grown by 16% in recent years (MBW, 2022). Thus, there are more listeners, economically strong countries pay more to have a Spotify subscription, however that doesn't affect artists' salaries.

The technological revolution of the 21st century, processes such as the development of information and communication technologies, production standardization, artificial intelligence, neural networks, digitization, cloud engineering, the interconnection of the physical and virtual worlds (L. Da Xu et al., 2018), is changing not only business or principles of production but also of the cultural sectors. For current and future artists to remain competitive in the face of the fourth and fifth industrial revolutions it is necessary to understand how it affects the art market. Beier distinguishes key often cited features of technological advancement and enumerates areas of effect (Beier et al., 2020): employees, communication, human-machine interaction, collaboration, automation, big data, decentralization, flexibility, interconnectedness, customization, efficiency, internet of things, cyber-physical systems, integration, autonomy, service-orientation, data management.

Summing up, the context in which music business exists is complicated and complex. The inability to define music business as a clear and representative notion makes music research at best problematic since a researcher has to be knowledgeable in 22 subsections of the industry (Table 1). However, presenting a literature review of music business areas clarifies how the business is viewed and researched as well as sets grounds for niche areas that are yet to be researched. out.

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Research of scientific publications was a result of a compound search of keywords music industry and technologies. To carry out the search, keywords “music industry”, “music sector”, and “music market” were used with a logic operator “or” and with “and” “technology or technologies”. For the review, the global citation database “Web of Science” was chosen. This database is known for indexing cited articles thus creating not as an extensive as others but assessed and verified scientific research database.

Since technologies are sensitive to time and what was five years ago a novelty or a breakthrough, a time frame for the research was set from 2020 until 2022. Only articles in English and Lithuanian corresponding to the object and purpose of the study were analysed. In total 75 articles were selected for the research. The remaining articles were not analysed due to them focusing on a different subject, other than the music industry or being inaccessible in their full version.

Results

After being analysed, articles were categorized into 5 thematic sections: 1) Information and communication technologies (ICT), and neural networks; 2) New business ventures; 3) Creativity, and education; 4) Intellectual property rights, and blockchain technology; 5) Digitization, and streaming. The categories also were divided into 15 sub-categories (Table 2).

Table 2. Research directions of the music industry in the last two years.

No.	Thematic section	Sub-section	Research in subsection
1.	ICT (information and communication)	Lessened limitations	Bossey, 2020; Hao, 2022; Nguyen et al., 2020; Weng & Chen, 2020; Roy et

	ation technologi es) and neural networks	Satisfied customer needs	al., 2020; Yi et al., 2022 Dimitrakopoulos & Panagiotopoulos, 2021; Fan, 2022; Tiple & Patwardhan, 2022
2.	New business ventures	Digital economy force	Psomadaki et al., 2022; Liu et al., 2021; Etzkowitz et al., 2021; O'Grady, 2021; Peng-Li et al., 2020; Hermawan & Abiyusuf, 2021; Tan et al., 2020; Yulianto & Hillebrandes Oroh, 2021; Rendell, 2021; de Beukelaer & Eisenberg, 2020; Wilson et al., 2020; Schlarb et al., 2021; Wang, 2021; Yang & Nazir, 2022; Hwang et al., 2020
		Overtaking old systems	Bossey, 2022; Poulios & Kamperou, 2022; Eriksson, 2020a; Khamis & Keogh, 2021; Kim & Oh, 2021; Siddiqui et al., 2021; Barboza et al., 2021
3.	Creativity and education	Collaborati on	Fauchart et al., 2022; Wei, 2021.
		Staying relative and creative	GÜVEN, 2020; Woods, 2021; Li, 2020; Barneva et al., 2021
		Fighting against homogeniz ation	Faure-Carvallo et al., 2022; Cao, 2021; Walzer, 2020) Sun, 2021; Yende, 2021; Havrilova et al., 2021; Li & Li, 2021; Cruz- Cárdenas et al., 2021
		Digital education	Budoiu Bălan & Bardazzi, 2022; Liu, 2022; Xue & Jia, 2022
4.	Intellectua l property rights and blockchai n	Increased safety and security	Chalmers et al., 2021; Gürfidan & Ersoy, 2021
		Increased financial	Coccia, 2020; Lovett, 2020;

	technolog y	gain and market share	Owen & O'Dair, 2020
		Autonomo us and transparent intellectual rights	Esmaeilian et al., 2020; Kapsoulis et al., 2020; A. Kim & Kim, 2020; Lin & Lin, 2018; Lovett, 2020; Trequattrini et al., 2022; Watson & Leysdon, 2022
5.	Digitizatio n, and streaming	Digital economy force	Li & Suping, 2022; Zanella et al., 2021; Stratton, 2021; Kim et al., 2021; Parc & Kim, 2020; Colbjørnsen, 2021; Szymkowiak et al., 2020
		Eliminatin g piracy	Barata & Coelho, 2021; Li et al., 2020
		Content accessibilit y	Li & Ren, 2020; Mulla, 2022
		Artistic relevance	de Waard et al., 2022; Duvall, 2022; Zhang & Negus, 2021

Source: the authors' compilation.

Next, the conclusions and insights of the analysed articles are presented in more detail. Articles in the first category *Information and communication technologies and neural networks* focus on researching how technologies *lessen* previous *limitations* and *satisfy* *customer needs* in the music industry. For example, the ability to identify music signals enables tuning musical on a level that previously did not exist (Hao, 2022), a trained artificial neural network is able identify “different types of musical instruments and has an accuracy rate of ~96.47%” (Roy et al., 2020). New technologies allow addressing new audiences by adapting to the way they are used to consume music (Nguyen et al., 2020). Moreover, whilst addressing deep learning, new technological advancement bridges the gap between music producers, allows new members to enter music creation market which consequently affects how many products can be offered to the listeners (Weng & Chen, 2020).

The second category, *New business ventures*, focuses on how technologies act as a driving digital_economical force and how they are overtaking old systems. Authors underline the importance of smartphones in musical entrepreneurship. Musicians now are able to be visible and form relationships with audiences (Psomadaki et al., 2022) as well as to measure their influences (Y. Liu et al., 2021), an emerging virtual reality world opens up new business ventures (Bossey, 2022). What was once controlled by a set group of businessmen who owed music labels, now is in hands of every musician who is able to employ the use of Spotify (Eriksson, 2020). Case studies show that

“granular data provided by music intelligence technologies, combined by machine learning prediction algorithms, can help the music industry’s practitioners to make better decisions” (Kim & Oh, p. 8, 2021). It is important to note, that technologies now form specific algorithms which suggest what music a potential listener is supposed to listen to or which songs are to become hits (Yulianto & Hillebrandes Oroh, 2021). Even though audiences and music developers gain more power on their own, it is also shown that development requires all parties to participate, since listeners, developers, manufacturers etc., are a part of the same circle (Wilson et al., 2020). Furthermore, it is presented that music industry would have been destroyed by COVID-19 if not for the technological advancement (Wang, 2021), it enabled musicians and their audiences to control and prolong their relationships online.

The third set of articles in a section Creativity and education has researched how technologies enabled collaborations between humans and machines by creating new sounds that are spread to expansive digital audiences (Barboza et al., 2021; Li, 2020), new content by employing digital recording, production, and distribution technologies (Woods, 2021). Authors also note that computers are becoming more equipped in creating their own music, listeners are moving towards consuming products that are trendy and simple and that technological advancement homogenizes music (Faure-Carvalho et al., 2022). The music industry’s pricing, retail models and the industry itself are undergoing dramatic changes (Li, 2020). Musicians experience difficulties securing a steady job (GÜVEN, 2020), some teachers are made redundant because technologies carry certain musical performance assessments that were previously made by teachers (Liu, 2022). Cao notes that the gap between digital technologies, computers, software programs and education is narrowing (Cao, 2021). Due to 5G, new media, digital audio workstations, new scoring systems education can now be accessed where it was previously inaccessible, music can be performed by machines and human input is likely to be less necessary (Wei, 2021; Xue & Jia, 2022; Yi et al., 2022).

Another area of music business affected by technological advancement is intellectual property rights and blockchain technology. Scientists propose employing blockchain technologies in new music wallet models that eliminate third parties, which makes it more secure and cheaper for musicians to control their rights (Coccia, 2020; Gürfidan & Ersoy, 2021). Smart contracts and cryptocurrencies are removing intermediaries from a previously stagnant music industry supply chain (Chalmers et al., 2021). Blockchain technologies are shown to have potential for recognizing music ownership (Lovett, 2020) and enabling musicians to earn revenue from their production in an autonomous and timely manner (Owen & O’Dair, 2020; Trequattrini et al., 2022).

The final set of articles focused on *Digitization and streaming*. The combination of the two enables 5G, big data, artificial intelligence, cloud computing and the Internet of Things to continue increasing the amount of digital content which drives digital economy (Li & Suping, 2022). Several authors note that piracy levels have significantly dropped down due to affordable music

streaming services (Barata & Coelho, 2021; Mulla, 2022). Content sharing has never been employed as much but such platforms as YouTube make it easy and legal, moreover content quality is no longer required to be of a high standard (Stratton, 2021; Q. Zhang & Negus, 2021). Due to high demand streaming services are evolving, changing and unstable, since new members enter the market constantly (Colbjørnsen, 2021; Szymkowiak et al., 2020).

Five categories presented above show that music business researchers tend to find positive outcomes of technological advancement. There is a considerable amount of prospects for industry participants to extend their business without having to share profits with third parties since music production and distribution can be done without hiring specialists or belonging to labels, however audience reception, requirements for digital world’s technical skill, trends in consumerism and increase in music supply have to be taken into consideration.

Discussion and conclusions

The research showed that even though the majority of scientific literature focuses on how technology advances music business, very few researchers point out how to deal with the negative effects. Whereas A. de Waard focuses on providing solutions (de Waard et al., 2022), X. Liu demonstrates how efficient new piano player evaluation system is, and how effectively it could sort the shortage of music teachers in the market, nothing is said about the consequences exchanging human skill with technology (Liu, 2022). Researchers note that lack of technological skill or fast-moving adaptation of new technologies is an issue (Bossey, 2022; Psomadaki et al., 2022; Watson & Leyshon, 2022; Zanella et al., 2021) do not propose how to approach it.

Positive trends, increased security and revenue brought by technology in regard to intellectual property are enumerated and supported (Chalmers et al., 2021; Esmaeilian et al., 2019), yet competencies and skills required to be had by an artist who seeks to use these positive effects of technology are not discussed or reviewed. Moreover, no research is done on how artists who aren’t skilled in internet technologies nowadays adapt to them.

There is a need for scientific approach to finding solutions how to address technological advancement and lack of technological knowledge for those who are in the music business. It could be a promising direction for further research which has practical use.

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