

Digital Innovation in the Croatian Music Sector: A Preliminary Study

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Abstract

Since the emergence of soundtracks, the music industry has been largely driven by innovation. The technological advances of the 20th century have significantly impacted society and the economy. Rapid development and use of the internet, in particular, strongly transform the music industry—especially in terms of how music is created and consumed. In this study, we tried to examine the changes in the music industry resulting from digital technology advancements. Furthermore, we aimed to examine how Croatians have incorporated digital innovations into their music-listening practices. The study explores: (i) respondents' usage of media players and music platforms, (ii) age and gender differences in respondents' reactions to industry developments, and (iii) preferences for digital versus analog music formats. Conducted on a random sample of 146 Croatian respondents, the research reveals a strong influence of digitalization on the music industry, with respondents showing high adaptability to these changes. Participants identified accessibility and the availability of music content as key benefits of digitalization, while piracy was noted as its primary drawback. Additionally, no significant age-based differences were found regarding preferences for digital or analog formats. While respondents acknowledged certain advantages of analog formats, digital music remains equally, if not more, widely used.

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Introduction

Advancement and usage of information and communication technologies (ICTs) has strong impact in different business and private spheres of life. One of entertainment sectors like music industry is affected the most with ICTs (Xanthidis et. al., 2006). New applications, the popularity of social media, and social networks implicit higher usage of Internet and adaption to new technologies in music industry. Internet and new audio file formats present an effective tool in the process of digitalization and leads to a major change in the consumption and the creation of music. Technology play a crucial role regarding development of music industry and distribution possibilities (Power and Jansson, 2004).

Development of music industry has several phases, starting from vinyls to CDs, from CDs to mp3s and from mp3s to streaming services (Fuentes et. al., 2019). There are many benefits of digitalization in music industry. Individuals can easily access music using smartphones and other devices that they use every day. In addition, development of music platforms enables individuals to access music content with no time or place restrictions and with increased mobility (Sinclair, Tinson, 2017). As a result of digitalization, music become important part of everyday life especially for younger who grown up surrounded by technology (Fuentes et. al., 2019). Furthermore, digitalization decreases the costs that enable consumers more satisfaction and wider range of different low-cost services (Aguiar, Martens, 2016). However, beside advantages, there are also obstacles like piracy which includes pirate recording, unauthorized uploading or downloading of music content (Xanthidis et. al., 2006). Other negative change regarding impact of digitalization for firms from music industry is revenue decreasing (Aguiar, 2017). There are two main reasons: illegal file sharing and new business models that are new to consumers (Bustinza et. al., 2013). Besides benefits or obstacles, digitalization has really changed music consumption. Music listening is not anymore one activity and today is integrated into other daily activities, like running, car driving, travelling (Hagberg, Kjellberg, 2017).

This paper aims to investigate Croatians attitudes and habits regarding impact of digitalization on music industry. Therefore, the descriptive analysis was applied with the goal to detect what platforms and media players individuals use the most, what is their opinion and preferences regarding digital and analogue music formats, what they consider as benefits or obstacles regarding digitalization in music industry and how they perceived influence of digitalization on music consumption. Research results showed that respondents mostly used smartphones for music reproduction while YouTube is the most used music platform. Accessibility and availability of music content present the main advantage of digitalization in music industry while piracy is named as the main obstacle. There are also differences between young and older respondents while younger mostly prefer digital music format and older mostly preferred analogue music formats. However, respondents mostly agree that digitalization has improved the music industry in general and that there are many benefits of digitalization on music industry.

The paper is structured into four sections. This first section has introduced the notion of digitalization and music industry and impact of development of ICTs to music industry. The second section presents data collection process and methodology. Research results are presented in the third section. Finally, the last section concludes the paper, dealing with findings, limitations and future implications.

Data and Methodology

This study aimed to present how the music industry has changed as a result of the advancement of digital technologies. In addition, we tried to investigate how people

in Croatia have accepted new music-listening gadgets through: (i) media players and music platforms that respondents have used, (ii) differences among age and gender of the respondents and their habits regarding changes in music industry, and (iii) respondents' preferences regarding usage of digital and analogue music.

A simple close-ended questionnaire was conducted in March 2021. The survey was made by Google forms and was conducted on a random sample of 146 respondents from Croatia. The results were analysed in terms of descriptive statistics methods and techniques. Table 1 presents respondents' characteristics: gender, age, level of education and position.

Table 1

Descriptive statistics of the respondents' characteristics

| Respondents' characteristics | N=146 |
|------------------------------|--------|
| Male | 35,6 % |
| Female | 64,4 % |
| 15-25 | 34,9 % |
| 26-35 | 26,0 % |
| 36-45 | 23,3 % |
| 46-60 | 13,7 % |
| 61+ | 2,1 % |
| High school diploma | 41,8 % |
| Bachelor's degree | 15,8 % |
| Master's degree | 38,4 % |
| MBA/PhD | 4,0 % |
| Employed | 61,6 % |
| Studying | 30,1 % |
| Unemployed | 5,2 % |
| Freelance | 2,3 % |
| Retired | 0,8 % |

Source: Authors' work (2021)

Sample size was 146, with 64,4% of female and 35,6% of male respondents. The most of the respondents belong to younger population, from 15 to 25 years (34,9%) and from 26-35 years (26,0%). There is lower percentage of older people from 46-60 years (13,7%) and of those older than 61 (2,1%). Furthermore, most of the respondents finished high school (41,8%) and faculty (38,4%). Only 4,0% of respondents have MBA or PhD diploma. In addition, mostly employed people (61,6%) and students participated in the survey (30,1%).

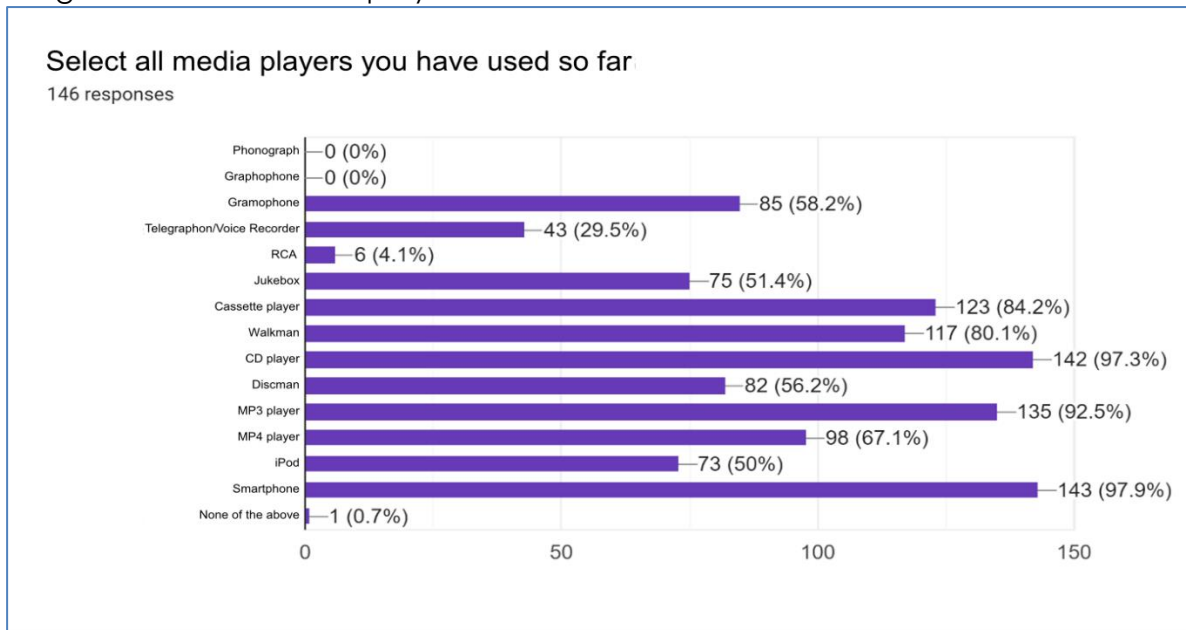
Results

Research results are focused on: (i) media players and music platforms that respondents have used, (ii) differences among age and gender of the respondents and their habits regarding changes in music industry, (iii) respondents' preferences regarding usage of digital and analogue music and (iv) changes in music industry due to development of digital technologies

Media players and music platforms that respondents have used

Figure 1 presents usage of different media players. Most of the respondents use the CD player (97,3%), MP3 player (92,5%) and smartphone (97,9%). Furthermore, there are no participants who have ever used phonograph and graphophone, and only 4,1% of respondents used RCA.

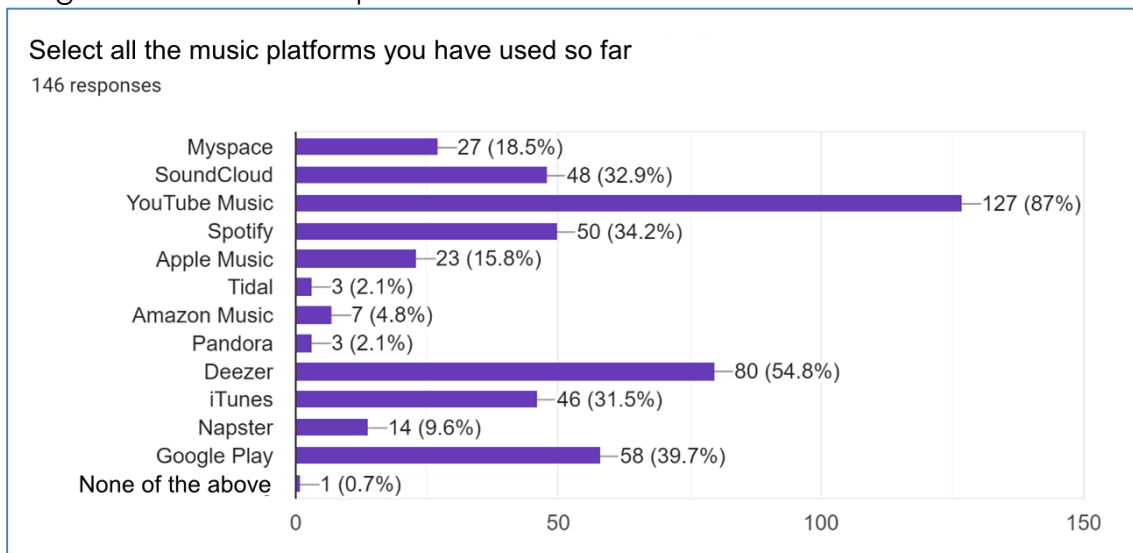
Figure 1
Usage of different media players



Source: Authors' work (2021)

Figure 2 presents usage of different media platforms. Most of the respondents use the YouTube music (87%). In addition, more than half of them use Deezer (54,8%) and around third of them use Sound Cloud (32,9%), Spotify (34,2%), iTunes (31,5%) and Google play (39,7%). The lowest percentage of respondents use following media platforms: Tidal (2,1%), Amazon Music (4,8%), Pandora (2,1%).

Figure 2
Usage of different music platforms



Source: Authors' work (2021)

Differences among age and gender of the respondents and their awareness regarding changes in music industry

Table 2 illustrates the relationship between gender and age of the respondents and their awareness regarding the changes in the music industry. The results showed that most of the respondents were not particularly aware in their knowledge of changes in music industry no matter of age or gender. However, respondents from 26-35 years are mostly aware of changes, while elderly respondents from 61 years and more are mostly not aware of changes in music industry.

Table 2

Awareness regarding changes in music industry by gender and age of respondents

| Do you think you are well aware of the changes in the music industry? | Yes | Partially | No | Total | % |
|---|--------|-----------|--------|-------|--------|
| 16-25 | 13 | 24 | 14 | 51 | 34,93% |
| Male | 7 | 4 | 3 | 14 | 9,59% |
| Female | 6 | 20 | 11 | 37 | 25,34% |
| 26-35 | 14 | 13 | 11 | 38 | 26,03% |
| Male | 11 | 4 | 5 | 20 | 13,70% |
| Female | 3 | 9 | 6 | 18 | 12,33% |
| 36-45 | 11 | 14 | 9 | 34 | 23,29% |
| Male | 1 | 3 | 2 | 6 | 4,11% |
| Female | 10 | 11 | 7 | 28 | 19,18% |
| 46-60 | 6 | 10 | 4 | 20 | 13,70% |
| Male | 4 | 5 | 2 | 11 | 7,53% |
| Female | 2 | 5 | 2 | 9 | 6,16% |
| 61+ | 0 | 1 | 2 | 3 | 2,05% |
| Male | 0 | 1 | 0 | 1 | 0,68% |
| Female | 0 | 0 | 2 | 2 | 1,37% |
| Total | 44 | 62 | 40 | 146 | 100% |
| % | 30,14% | 42,47% | 27,40% | 100% | |

Source: Authors' work (2021)

Table 3 presents and compares results regarding respondents' awareness of changes in the music industry and results about previous ways of reproduction of music according to age and gender of the respondents.

From the 44 people who marked that they are well aware of changes in the music industry (Table 2), 30 of them have marked negatively on a question if previous ways of reproduction of music were better than today's, while only 14 people have declared themselves positive (Table 3).

Based on the table above some attributes are filtered for more broader content. The first filter is by gender and awareness of changes. From the 44 people who have indicated that they are well aware of changes in the music industry, 23 are male and 21 are women. Furthermore, male respondents mostly declared themselves as negative (15 out of 23), all in age group 36 to 60, and a majority of 16-25, while group 26-35 were in the minority (5 out of 6), and almost half male participations has declared themselves as positive (8 participants) when asked if previous ways of reproduction music were better than today's. According to these criteria, at the age of 26-35 more men declared that previous ways of playing music were better (6 out of 11 people), while at age 16-25 person declared positive only 2 out of 7, and none from group 36-45 and 46-60.

The second filter for this analysis refers to female respondents who are well aware of changes in the music industry. Out of a total 21 women who said that they were

well aware with changes in the music industry, 28,57% (6 out of 15) think that previous ways of reproducing were better than today's, while 71,43% think they are worse. Furthermore, 83,33% female at the age 16 to 25 believed that reproduction of music is no better than today, and 16,67% think otherwise. Also, there are no participants at the age group 61 + according to these criteria.

Table 3

Comparison of the two questions distributed by age and gender: Q1-Do you think you are well aware of the changes in the music industry? // Q2-Do you think that previous ways of recording musical material were better than today's?

| Do you think you are well aware of the changes in the music industry? (distribution by age and gender) | Do you think that previous ways of recording musical material were better than today's? | | | % |
|---|---|--------|-------|--------|
| | Yes | No | Total | |
| 16-25 | 11 | 40 | 51 | 34,93% |
| Male | 2 | 12 | 14 | 9,59% |
| Yes | 2 | 5 | 7 | 4,79% |
| Partially | 0 | 4 | 4 | 2,74% |
| No | 0 | 3 | 3 | 2,05% |
| Female | 9 | 28 | 37 | 25,34% |
| Yes | 1 | 5 | 6 | 4,11% |
| Partially | 5 | 15 | 20 | 13,70% |
| No | 3 | 8 | 11 | 7,53% |
| 26-35 | 10 | 28 | 38 | 26,03% |
| Male | 8 | 12 | 20 | 13,70% |
| Yes | 6 | 5 | 11 | 7,53% |
| Partially | 1 | 3 | 4 | 2,74% |
| No | 1 | 4 | 5 | 3,42% |
| Female | 2 | 16 | 18 | 12,33% |
| Yes | 1 | 2 | 3 | 2,05% |
| Partially | 0 | 9 | 9 | 6,16% |
| No | 1 | 5 | 6 | 4,11% |
| 36-45 | 4 | 30 | 34 | 23,29% |
| Male | 1 | 5 | 6 | 4,11% |
| Yes | 0 | 1 | 1 | 0,68% |
| Partially | 0 | 3 | 3 | 2,05% |
| No | 1 | 1 | 2 | 1,37% |
| Female | 3 | 25 | 28 | 19,18% |
| Yes | 3 | 7 | 10 | 6,85% |
| Partially | 0 | 11 | 11 | 7,53% |
| No | 0 | 7 | 7 | 4,79% |
| 46-60 | 7 | 13 | 20 | 13,70% |
| Male | 1 | 10 | 11 | 7,53% |
| Yes | 0 | 4 | 4 | 2,74% |
| Partially | 0 | 5 | 5 | 3,42% |
| No | 1 | 1 | 2 | 1,37% |
| Female | 6 | 3 | 9 | 6,16% |
| Yes | 1 | 1 | 2 | 1,37% |
| Partially | 3 | 2 | 5 | 3,42% |
| No | 2 | 0 | 2 | 1,37% |
| 61+ | 1 | 2 | 3 | 2,05% |
| Male | 0 | 1 | 1 | 0,68% |
| Partially | 0 | 1 | 1 | 0,68% |
| Female | 1 | 1 | 2 | 1,37% |
| No | 1 | 1 | 2 | 1,37% |
| Total | 33 | 113 | 146 | 100% |
| % | 22,60% | 77,40% | 100% | |

Source: Authors' work (2021)

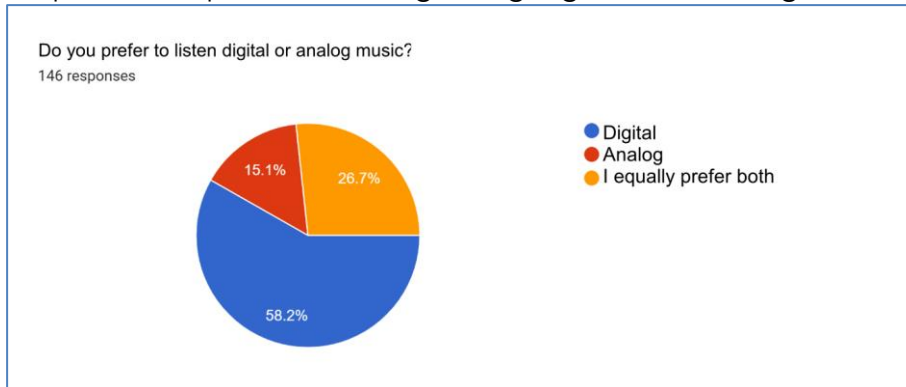
The third filter were set as male participants and persons who mark that there are partially aware of changes and according to these criteria, everyone stated that previous ways of reproducing were not better except one person. For these sets of criteria there are 4 men from 16 to 25, and 4 men from 26 to 35, 3 men from 36 to 45, and 5 males aged 46 to 60 years and one man who has 61 years and more. Women responded similarly, 8 out of 45 women filled out the survey positively and 37 negatively. In aged group 46 to 60, 3 out of 5 women think that previous ways of reproducing were better.

Respondents' preferences regarding usage of digital and analogue music

Figure 3 presents respondents' preferences regarding digital and analogue music. Research results showed that more than half of the respondents prefer digital music (58,2%). Lower percentage of respondents prefer analogue music (15,1%). Around quarter of respondents prefer equally digital and analogue music (26,75%).

Figure 3

Respondents' preferences regarding digital and analogue music



Source: Authors' work (2021)

Respondents' preferences regarding digital and analogue music distributed by gender are described in Table 4. There are no differences regarding respondents' preferences of analogue music according to gender (male: 15,38% and female: 14,89%). However, there is higher percentage of female respondents (60,64%) who prefer digital music compared to male respondents (53,85%).

Table 4

Respondents' preferences regarding digital and analogue music distributed by gender

| Do you prefer to listen digital or analogue music? | Analogue | | Digital | | Both | | Total |
|--|----------|--------|---------|--------|------|--------|-------|
| | | % | | % | | % | |
| Male | 8 | 15,38% | 28 | 53,85% | 16 | 30,77% | 52 |
| Female | 14 | 14,89% | 57 | 60,64% | 23 | 24,47% | 94 |
| Total | 22 | - | 85 | - | 39 | - | 146 |
| % | | 15,07% | | 58,22% | | 26,71% | 100% |

Source: Authors' work (2021)

Respondents' preferences regarding digital and analogue music distributed by age are described in Table 5. There is quite similar percentage of respondents who prefer analogue music regarding following age groups: 26-35 years (18,42%), 36-45 years (20,59%) and 46-60 years (20,0%). However, there is higher percentage of

younger respondents who prefer digital music (16-25years: 62,75% and 26-35 years: 60,59%). Around half of the respondents in the middle age group prefer digital music (36-45years: 52,94% and 46-60 years: 55%) and third of them older than 61 years prefer digital music (33,33%).

Table 5

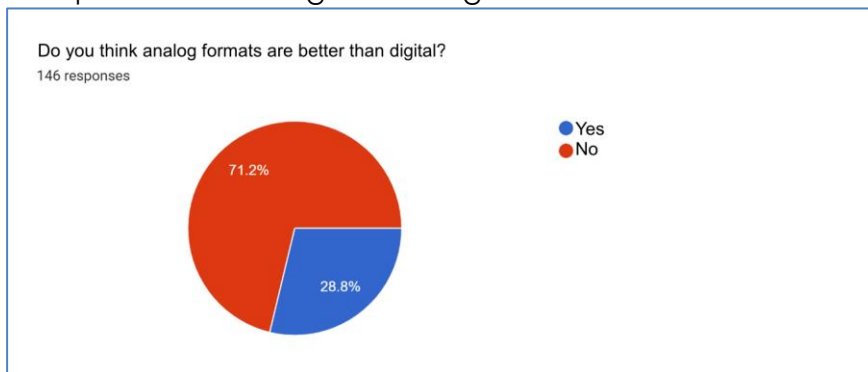
Respondents' preferences regarding digital and analogue music distributed by age

| Do you prefer to listen digital or analogue music? | Analogue | | Digital | | Both | | Total |
|--|----------|--------|---------|--------|------|--------|-------|
| | | % | | % | | % | |
| 16-25 | 4 | 7,84% | 32 | 62,75% | 15 | 29,41% | 51 |
| 26-35 | 7 | 18,42% | 23 | 60,53% | 8 | 21,05% | 38 |
| 36-45 | 7 | 20,59% | 18 | 52,94% | 9 | 26,47% | 34 |
| 46-60 | 4 | 20,00% | 11 | 55,00% | 5 | 25,00% | 20 |
| 61+ | 0 | 0,00% | 1 | 33,33% | 2 | 66,67% | 3 |
| Total | 22 | - | 85 | - | 39 | - | 146 |
| % | | 15,07% | | 58,22% | | 26,71% | 100% |

Source: Authors' work (2021)

Figure 4 presents respondents' opinion regarding quality of analogue and digital formats. Research results showed that most of the respondents (71,2%) think that digital formats are better, while 28,8% respondents stated that analogue formats are better.

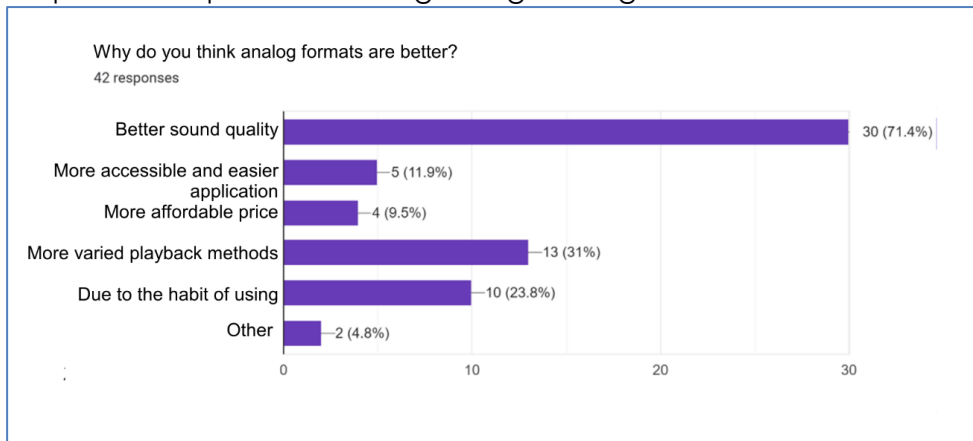
Figure 4
Comparison of analogue and digital formats



Source: Authors' work (2021)

Following two questions are focused on respondents' decision regarding characteristics of analogue formats that are better than digital formats. According to research results presented at Figure 5, most of the respondents indicated that analogue formats provide better sound and quality (71,45%). Furthermore, third of them stated that analogue formats offer more varied playback methods (31%) and quarter stated that they get used to analogue formats (22,8%).

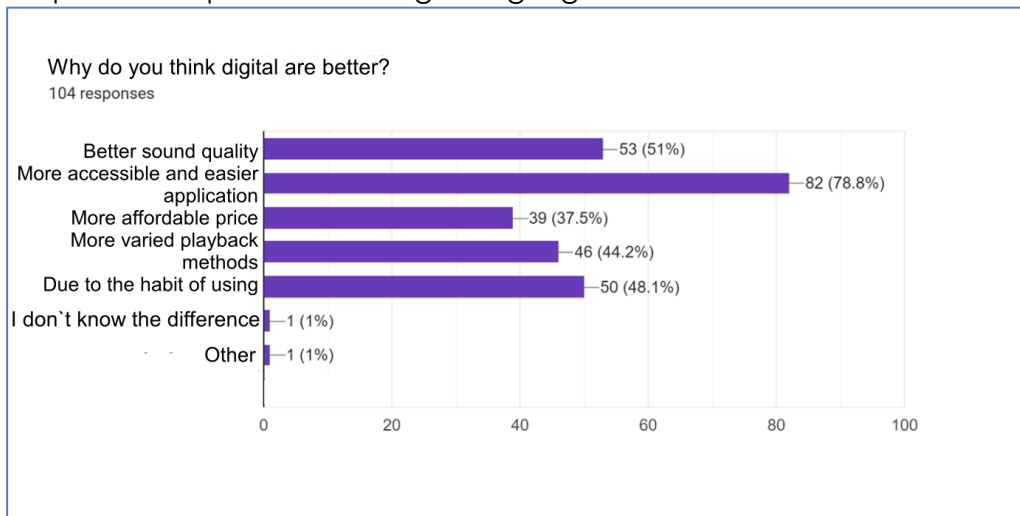
Figure 5
Respondents' preferences regarding analogue music



Source: Authors' work (2021)

According to research results presented at Figure 6, most of the respondents indicated that digital formats are more accessible and easier to use (78,8%). Furthermore, around half of them stated that digital formats have better sounds quality (51%) and that they get used to digital formats (48,1%). More affordable price is also one of the reasons why respondents prefer digital formats more than analogue formats (37,5%).

Figure 6
Respondents' preferences regarding digital music

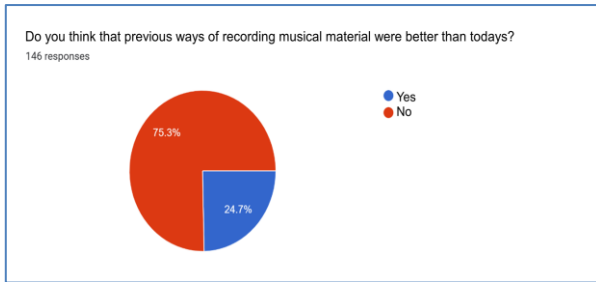


Source: Authors' work (2021)

Changes in music industry due to development of digital technologies

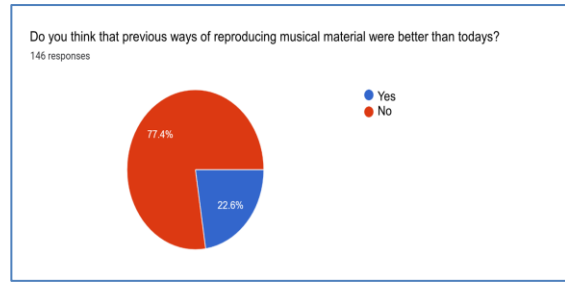
Figure 7 and Figure 8 presents respondents' opinion regarding previous ways of recording and reproducing musical materials. Lower percentage of the respondents think that previous ways of recording (24,7%) and reproducing (22,6%) musical materials were better than today.

Figure 7
Previous ways of recording musical material



Source: Authors' work (2021)

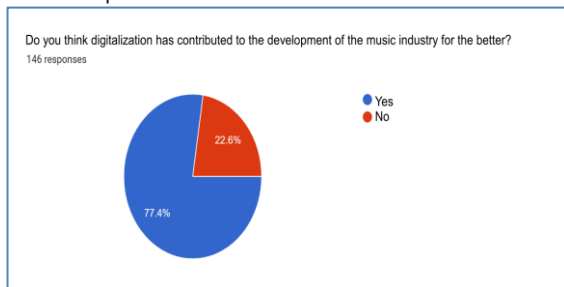
Figure 8
Previous ways of reproducing musical material



Source: Authors' work (2021)

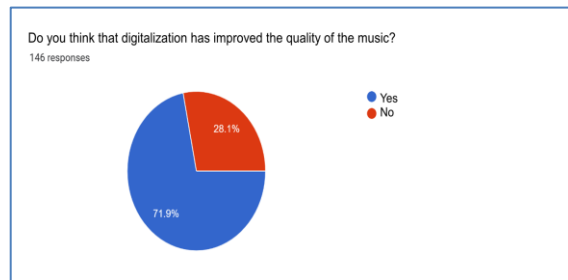
Figure 9 presents respondents' opinion regarding impact of digitalization to the better development of music. Most of the respondents perceived that digitalization has contributed to better music development (77,4%).

Figure 9
Impact of the digitalization to the better development of the music



Source: Authors' work (2021)

Figure 10
Impact of digitalization on the quality of the music



Source: Authors' work (2021)

According to results presented at Figure 10, most of the respondents (71,9%) perceived that digitalization improved the quality of the music.

Table 6
Advantages of digitalization in the music industry

| Advantages of digitalization in the music industry | N=146 |
|---|---------|
| Accessibility and availability of content worldwide at any time | 52,10 % |
| The amount of content that can be stored | 17,80% |
| Good protection against mechanical damage | 7,50% |
| Quality of recording music | 7,10% |
| Ability to quickly play multimedia content | 6,90% |
| Low consumer price of music material | 6,70% |
| Quality of music reproduction | 1,90% |

Source: Authors' work (2021)

Table 7
Disadvantages of digitalization in the music industry

| Disadvantages of digitalization in the music industry | N=146 |
|---|---------|
| Piracy | 51,40 % |
| There are no negative aspects | 24,00% |
| Poorer quality of music reproduction | 12,30% |
| Poorer quality of recording music materials | 4,20% |
| Insufficient content that can be stored | 4,20% |
| Unable to quickly play media | 2,0% |
| Unavailability of music content | 1,90% |

Source: Authors' work (2021)

Perceived advantages of digitalization in the music industry are described in Table 6. The results showed that the main benefits of digitalization are accessibility and

availability of music content (52,1%). Furthermore, respondents indicated that the amount of content that can be stored is also important advantage (17,80%). In addition, other advantages are: Good protection against mechanical damage (7,50%), Quality of recording music (7,50%), Ability to quickly play multimedia content (6,90%), Low consumer price of music material (6,70%).

Perceived disadvantages of digitalization in the music industry are described in Table 7. The results showed that the main negative aspects of digitalization are piracy (51,40%). Around quarter of respondents indicated that there are no negative aspects of digitalization of music industry (24,0%). In addition, other disadvantages are: Poorer quality of music reproduction (12,30%), Poorer quality of recording music materials (4,20%), Insufficient content that can be stored (4,20%).

Conclusion

The development and use of information and communication technologies (ICTs) has had a significant impact on fundamental changes in societies and economies during the last few decades. Individuals are more willing to use ICTs in all aspects of daily life, such as social media, e-learning platforms, e-government services, music platforms and online shopping. Younger generations, who have grown up surrounded by technology, are more eager to take advantages of ICTs and to participate in social and economic issues through digital platforms than the elderly. They are used to listen music via Internet, YouTube and other digital platforms. In addition, there is strong impact of digitalization on music industry while ICTs advancement influence from musical instruments to the creation of new music styles. Therefore, music industry has great benefits through digitalization which is very well accepted by individuals.

In this study, our intention was to present impact of digitalization on music industry and to investigate opinion and habits of individuals in Croatia regarding: (i) media players and music platforms that respondents have used, (ii) differences among age and gender of the respondents and their habits regarding changes in music industry, and (iii) respondents' preferences regarding usage of digital and analogue music. Data collected via online questionnaire were analysed using descriptive methods and techniques. Research results showed that respondents agree that digitalization has improved the music industry in general and that there are many benefits of digitalization on music industry. Half of the respondents indicated that the main advantage is accessibility and availability of music content with no place or time restrictions. Piracy is named as the main disadvantage of digitalization in the music industry. Furthermore, research results confirmed that younger prefer more digital than analogue music formats and that they are mostly used. Almost all respondents use smartphone for music reproduction and YouTube is the most used music platform.

This paper presents preliminary research and there are several limitations which should be overcome in the future research. Firstly, data were randomly collected via online questionnaire which suggested that individuals who do not use social networks could not participate in the survey. Secondly, all respondents are from one country, which could lead to generalization issues. Thirdly, only descriptive statistical methods have been used to analyse collected data. Future research should include more data for more countries or regions in order to compare them and get broader content of the impact of digitalization on music industry and individuals' habits. In addition, this research could be further improved by implementing additional statistical methods for data analysis. Besides, future research should determine how to foster elderly to use digital music formats and platforms.

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