Digital Music Technology for Independent Musicians

by

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December 2022

Presented to the

Division of Science, Information Arts, and Technologies

University of Baltimore

In Partial Fulfillment

of the Requirements for the Degree of

Master of Science

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Abstract

This study investigates the challenges faced by independent musicians in utilizing various forms of Digital Music Technology to achieve their career goals. Despite the numerous technological advancements, the music industry has seen over the years, independent musicians often struggle to effectively leverage them due to limited resources and a lack of understanding of the necessary processes. Through a review of existing literature of the technologies independent musicians use to market, distribute and record their music, and qualitative interviews with independent musicians, the study examines the current use and potential of music production software, online marketing and distribution platforms, and digital audio workstations by independent artists. The findings will be analyzed and coded to identify strengths and weaknesses of these tools and to provide a set of recommendations for design opportunities and improvements to assist independent musicians in reaching their goals. The purpose of this research is to uncover how independent musicians can leverage and interact with technological applications, processes, and means of Digital Music Technology to accomplish their musical career objectives.

Acknowledgments

First, I want to give a huge thank you to all the user interview participants who took time out of their musical schedules to provide didactic information that supports the thesis results and conclusion. I've known some of you for many years and others I met for the first time, so it was very interesting to hear varying opinions and practices that shared homogenous themes yet had distinct practices that catered specifically to you as an artist.

A thesis is only as good as those providing guidance and supervision so I would like to thank Dr. Bridget Blodgett and Dr. Ian Power for their advisement, time and support. Your help and encouragement have benefitted me greatly and I am appreciative for the opportunity to learn from you both while completing this thesis. I would also like to thank Dr. Deborah Kohl and Dr. Kathryn Summers for the didactic courses they taught related to research methods and human-computer interaction. The lessons learned from those courses served me greatly while completing this thesis and continue to serve me well in the product design field, as well.

I would like to thank my mother, Yakila, and father, Edoardo Sr., who have supported me greatly throughout my collegiate career. The love, support, and money you two have poured into me has strengthen me beyond words and I are so blessed to call you both my parents. Thank you so much for believing in me even when I often doubted myself and my abilities. To my sister, Kierra, thank you pushing me toward the finish line and setting the precedent as my eldest sibling that anything is possible if I just keep going! Thank you to my entire family who often send words of encouragement, monetary gifts, or offered beneficial advice.

Thank you to my friends – the entire XI Sigma chapter of Kappa Alpha Psi Fraternity, Inc. @ Baylor University, Joel (a.k.a. Geechi), Josh, J.D., Daniel, Eriq (a.k.a. E.Q.), Myriah (a.k.a MYND), Nick (a.k.a. Casey Cassh), Chris (a.k.a. Lace Hampton), and John Stephens who have been there for me through all my anxiety, laughs, tears, joys

and pains during my time at the University of Baltimore. It is truly a blessing to have such amazing friends who pour into me just as much as I can pour into them, so I owe you guys deeply!

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Chapter 1: Introduction

Digital Music Technology involves the use of any device, machine or software system by a musician to make or perform music, compose, notate, playback or record music, and/or to analyze and edit music. Research centered on this subject has established that Digital Music Technology has and will continue to be an integral part to the music creation process (M:tech Educational Services, 2008; Ahern, 2019; Bell, 2015; Shakar, 2001; Amedeo, 2009; Ogden, Ogden, & Long, 2011; Meler & Skoro, 2013). However, the current scope of Digital Music Technology research is limited to mainstream pre- and post-production responsibilities that are performed by popular musicians and their teams to arrange, record, publish, distribute, sale, market, and promote their releases effectively. This research aims to identify and comprehend how independent, or DIY musicians can leverage technology to complete certain post-production activities to advance their musical careers. Post-production activities refer to the tasks and processes that independent musicians undertake after recording their music to advance their careers regarding promotion, distribution, and recording. These post-production activities are essential for independent musicians to advance their careers and increase their reach in the music industry. Effective use of these activities can help independent musicians reach a wider audience, increase their exposure, and ultimately, achieve their musical career goals. This chapter will introduce the study by evaluating its context and background, explaining the current research problem, aims and objectives while highlighting the significance of this research and its limitations.

Background and Research Problem

Digital Music Technology has been an impactful transformation for the music industry and has supported the idea of unfettered access to creative musical expression

for all. Research has included studying how mainstream Digital Music Technology can be leveraged to promote musical innovation for popular musicians. However, research has traditionally focused on the impact of Digital Music Technology on a mainstream medium that often has the finances, support, industry contacts, and access to resources that independent musicians do not typically have. This leaves a gap for an industry that faces dramatic change as digital innovation and interaction advance, and new musicians, both independent and mainstream, debut on a tremendously frequent basis. This gap in the research is not inclusively beneficial for independent musicians who, too, must adapt to the constantly and rapidly evolving changes of the digital age. This lack of inclusivity leads to independent or DIY musicians feeling ill-equipped in terms of expertise in leveraging Digital Music Technology to assist in their musical careers.

Research Aims, Objectives and Questions

Given this lack of research regarding musical technology assisting independent or DIY musicians, this study will aim to identify and evaluate the ways in which Digital Music Technology can be leveraged by independent musicians to advance their musical careers. Digital Music Technology refers to digital tools, software, and platforms that enable musicians to create, produce, promote, distribute, and sell their music. This includes, but is not limited to, digital audio workstations, music production software, online music distribution platforms, and social media marketing tools. Digital Music Technology allows musicians to interact with their music and audience in real-time, enhancing their creative process and enabling them to reach a wider audience. These technologies provide musicians with new and innovative ways to produce, distribute, and market their music, and play a crucial role in the music industry of today.

The objectives of the research will include: 1) to identify shared music tools and technology leveraged by independent or DIY musicians, 2) to understand the value and

impact of tools and technological innovations, 3) to measure the level of experience independent or DIY musicians have with these tools and technological innovations, 4) to juxtapose these tools and technological innovations by strengths and weaknesses, and 5) to determine the beneficial improvements that can be made to these tools and technological innovations. The research questions addressed and answered are: 1) What music tools and technology are currently being leveraged by independent or DIY musicians? 2) how effective are the tools and technology?, 3) what are the strengths and weaknesses of each of these tools and technological innovations?, and 4) what is missing from these tools and technological innovations (or others) that would be beneficial to the independent or DIY music career?

Significance

This research will aid in adding to the body of knowledge on Digital Music Technology by shedding light on how these innovations can be beneficial to the success of independent or DIY musicians in an era where digital innovation is quickly and continuously evolving. This will aid in filling the gap in the existing research and provide real-world value to independent or DIY musicians looking to advance their musical careers.

Limitations

This study will have potential limitations as the research is based largely on qualitative research methods. As previously stated, one of the research limitations associated with this study is a lack of existing research on the benefits of Digital Music Technology for independent or DIY musicians specifically. Utilizing a combination of interviews and surveys will lead to diverse case studies from which competing conclusions may be drawn. While the cases and scenarios are validated, the results are

limited by the sample size of the research study. Given that the research cannot include all independent or DIY musicians worldwide, the scope of research participants will be limited. Participants may be subjectively bias to certain tools and technologies that may not be representative of the general independent or DIY musician population. Musical success is also not instant so longitudinal limitations may affect how the long-term effectiveness of these technological innovations and tools can be measured.

Structure

Following Chapter One where a brief overview is provided about the study and introduces its context, goals, queries and confines, Chapter Two will explore previously published works related to the context of this study to determine what research, solutions, and limitations have been previously explored relating to the research area. In Chapter Three, the methodology will be presented to outline and justify the research designs choices made while navigating through the research limitations. Chapter Four will present the discovery and comprehension of the research problem via an exploratory, qualitive research approach. Chapter Five will present the opportunities and objectives of resolutions derived from the results of the study. In Chapter Six, a proposed solution will be presented to solve the research problem in addition to justification for the research design choices made with respect to the research results. Chapter 7 will detail the usability of the design solution to understand its effectiveness addressing the research problem, concluded by a deductive account for all topics discussed in Chapter Eight.

Chapter 2: Literature Review

In this literature review, I will discuss the history of tools and technology through Digital Music Technology's current condition and possible uses for independent musicians who want to sell and distribute their music, market and promote it, and arrange and record it. This chapter will focus on the use of online platforms and services, social media tools, and DAWs used to enhance the musical creations of artists and to engage with their audiences in new and innovative ways. By examining the existing research in this field, we will gain a better understanding of the opportunities and challenges presented by Digital Music Technology for independent artists, as well as the potential for future research and development in this area.

A Brief History of Digital Music Technology

Digital Music Technology encompasses digital instruments, computers, electronic effects units, software, or digital audio equipment by a performer, composer, sound engineer, DJ, or record producer to produce, perform or record music (M:tech Educational Services, 2008). Digital Music Technology has a long and rich history, with tools and innovations that have enabled artists to distribute, market, and arrange their music in new and exciting ways. In the earliest days of music distribution, artists would often distribute their music through live performances or by selling physical copies of their music, such as sheet music or vinyl records (Beardsley, 2007). With the advent of the internet and digital media, artists were able to distribute their music online via services like DistroKid and TuneCore, making it accessible to a global audience (Ahern, 2019) via platforms like Napster, Spotify, and iTunes.

As the music industry has evolved, so too have the tools and techniques used by artists to market and promote their music. In the early days of the music industry, artists

would often rely on word-of-mouth and live performances to promote their music. With the rise of radio and television, artists were able to reach a wider audience through these mediums (Shakar, 2001). More recently, the internet and social media have provided new ways for artists to connect with their fans and promote their music (White 2007, Kartik & Mishra 2022).

In the realm of arranging and recording music, Digital Music Technology has also played a pivotal role. In the past, artists would often rely on traditional instruments and recording techniques to create and record their music (MN2S 2020). With the advent of digital audio workstations (DAWs), artists can arrange, edit, and record their music with greater efficiency and flexibility, using a wide range of virtual instruments and effects. (Marrington 2017).

Distribution and Sales

Horus Music defines music distribution as the “process of getting music from artist to store, making it available to the public for purchase" (2017). The history of music distribution can be traced back to the earliest forms of written music, such as sheet music. Before the advent of recorded music, sheet music was the primary means by which musicians and composers could share their work with others. (Anderson-Herley 2021) For musicians, there were several benefits and drawbacks of using sheet music, including the potential for income, dissemination in physical formats, the relatively low cost of distribution, and accessibility issues (MN2S 2020). As musical instruments and recording technology advanced, new methods of music distribution emerged, such as the player piano and the phonograph. Vinyl records, compact cassettes, and the compact disc allowed music to be easily distributed and sold to consumers (Anderson-Herley 2021). In the late 20th and early 21st centuries, the rise of the internet and digital technology led to the development of new music technologies, such as online music streaming services and

digital music downloads. These technologies have greatly expanded the reach of music distribution and sales, making it easier for artists to share their music with a global audience (MN2S 2020). In 2015, for the very first time, global digital music revenues surpassed those from physical formats (CD, vinyl, etc.).

In response to the recent advancements in Digital Music Technology that have expanded the ways in which musicians can distribute their music, artists can now share their work with a global audience through online music streaming services and digital music download via digital distributors or aggregators. Recent studies highlight DistroKid, AWAL, TuneCore, CDBaby, and LANDR as popular digital distribution options (Ahern 2019, Kärkinen 2021). The expansion of these digital distribution choices has increased consumer choice for how to access and enjoy music while simultaneously making it simpler for artists to gain new fans and further their careers. (Kärkinen 2021). The mention of specific digital distribution options, such as DistroKid, AWAL, TuneCore, CDBaby, and LANDR, suggests that these options may be particularly useful for independent artists looking to distribute their music digitally.

However, these new technologies have also presented challenges for musicians, such as the need to adapt to changing industry standards and the potential for piracy and unauthorized distribution of their work. Music piracy is a type of organized crime that involves the unauthorized reproduction and distribution of copyrighted music (Kusek, 2005). Valencia asserts that all parties engaged in the creation of a record, from the songwriter to the manufacturer, may suffer negative effects as a result of music piracy (2008); it can reduce the revenue that musicians and record labels earn from the sale of their music. In addition, music piracy can also make it more challenging for legitimate music distribution channels to compete with illegal sources of music.

Overall, the distribution of music through technology has had a tremendous impact on the music business, both favorably and unfavorably, and it continues to provide artists with new ways to release their records.

Marketing and Promotion

By means of product creation, distribution, and promotion, marketing refers to the strategies and tactics used by musicians to promote their music, build their brand, and reach their target audience. This may include leveraging social media, participating in online music communities, releasing music videos, performing live shows, collaborating with other artists, and utilizing online music distribution platforms. The goal of music marketing for most independent musicians is to increase their visibility and gain recognition in the music industry, ultimately leading to greater success and fulfillment in their musical career. The creation of the music product begins with the artist (Ogden, Ogden, & Long, 2011). Marketing comes into play to ensure there is awareness of music (Chen 2009). When radio was becoming popular in the 1920s and 1930s, its original focus was on evening family entertainment. Once radio and music truly collided in the ‘30s and ‘40s, the new relationship further escalated the opportunity for music and musicians to be known around the world. (Murphy 2015). Radio allowed artists to become national and regional stars with its reach and promotion of growth. (Chen, 2009; Shakar, 2001). As television became more widespread in the mid-20th century, music marketing also began to incorporate this medium, with artists appearing on television shows and music videos being aired on television networks (Shakar, 2001).

In the late 20th and early 21st centuries, the rise of the internet and digital technology revolutionized the way music was marketed. Music marketing in the digital age has a lot of components, with foundations in the recent full marketing mix. Many artists in the 2000s and beyond have explored different channels as a means of building a

fanbase and increasing their visibility. These channels include music distribution apps like Spotify and Tidal, social media websites like Facebook and Twitter, radio, magazine and brand partnerships, and more (Amedeo, 2009; Ogden, Ogden, & Long, 2011; Meler & Skoro, 2013) While there are many similarities between the marketing strategies of artists today, there are many options for artists to choose what type of career/brand they want to maintain and promote. Independent artists seem to more creatively target niche audiences that will engage with their music. More nationally recognized artists tackle a wide range of marketing tactics, but arguably lack the need to, with large followings and loyal fans/subscribers (White, 2007).

While using social media to promote music can be a potent tool for artists, there are a number of obstacles they must overcome in order to successfully connect with and engage their audience. According to Meler & Skoro (2013), one of the practical aspects of music marketing using social media is that artists frequently succumb to social media's inherent drawbacks. These include changing algorithms that may have an impact on an artist's content visibility and reach limitations that may make it challenging for artists to reach a broad audience with their music.

The way music is promoted and marketed has changed significantly as a result of technological advancements, and music marketers continue to adjust as new technologies are introduced.

Arranging and Recording

The story of audio recording and reproduction began in 1877 when Thomas Edison invented the phonograph, an early audio-reproducing machine that used cylinders to record as well as reproduce sound. The phonograph was later advanced and as developments continued for the wax-produced system, this change in design resulted in

the graphophone, an improvement to the phonograph developed by Emil Berliner between 1887 and 1893 and the basis for the vinyl record player because it able to interpret grooves on flat discs instead of the cylinder that Edison used. According to Beardsley (2007), the vinyl record became necessary by 1902 because it was easier to mass producer, hence preferred by manufacturers. These early discs showed that music recording could be a successful business. Sound recording development continued to be explored further as vinyl remained the dominant format until the end of World War II in 1945 when magnetic tape recording was discovered in the German territory and became exposed to the rest of the world. Magnetic tape provided another dramatic leap in audio fidelity. MN2S (2020) notes that magnetic cassette tapes became the standard medium of audio master recording by 1960.

By the late 20th century, the development of digital audio recording technology revolutionized the way music was recorded and produced. Digital audio workstations (DAWs) became widely available in the late 1990s and allowed for the creation and manipulation of audio recordings using a computer (Bel, 2015. DAWs made it easier for musicians to record, edit, and produce music, and they have become an essential tool in modern music production (Bell, 2015; Marrington 2016). Music audio recording as we know it today is dramatically different from the way it was years ago; from its original beginnings, recording has undergone several digital advancements. Though some express how the previous developments captured a continuous analog of the sounds being recorded (MN2S 2020; Beardsley 2007), Dobie (2001) summarizes how digital recording captures sound by means of a very dense and rapid series of discrete samples of the sound and how this impacted the way audio samples were recombined to form a continuous flow of sound. This suggests that artists had an opportunity to create unique and different sounds that would distinguish their creativity. DAWs provide musicians more control

over their music, allowing them to fine-tune their compositions and make precise adjustments. This is very beneficial for artists that work on their own or produce their own music (Marrington, 2016).

The response to the debut of DAWs has been mixed, with some artists finding them to be a useful tool and others feeling that they have had a negative impact on the industry. Researchers share that some artists faithfully engage over quality concerns as they feel the quality of music produced using DAWs is not as good as music produced using traditional recording techniques (Terren, 2019).

Nevertheless, music recording will continue to grow beyond its current state, becoming a more sophisticated and accessible medium as it has done over time.

Conclusion

The literature review examined how artists use online technology and resources, social media sites, and DAWs to enhance their musical productions and engage with their audience in unique and inventive ways. However, additional investigation is suggested to look specifically at the music technologies that independent artists use. Further study should take into account experience levels that independent artists have with these innovations in addition to the technologies' benefits, drawbacks, impacts, and unmet needs.

Chapter 3: Methodology

The focus of this study was to consider how independent, or DIY musicians used Digital Music Technology to advance their musical careers in specific post-production activities including distribution, marketing, and publishing. This chapter explores how the research designs choices made aligned with the research aims, objectives and research questions introduced in Chapter One. This chapter presents the research design choices which included the research philosophy, type and sampling strategy, the research questions that were explored, data collection and analysis methods and techniques leveraged, methodological limitations within the research design, and a conclusive summary of the methodology.

Research Philosophy

The research philosophy decided for this study was to use qualitative, human-centered research methods to explore and uncover unique perceptions, motives, expectations, and behaviors to obtain knowledge and understanding about the musicians' toolset. Typically, the philosophy of qualitative research is "interpretive, humanistic, and naturalistic" (Creswell, 2018). Qualitative research allowed for the exploration of complex and nuanced perspectives, experiences, and phenomena that may have been overlooked or under-represented in quantitative research (Tenny, Brannan, & Brannan, 2018).

Though the participants of this study homogenously identified as independent, or DIY musicians, their individual perceptions, interpretations and experiences with Digital Music Technology were from their unique point of views thus significant importance was placed on this subjectivity. By embedding myself in the situation and scenarios faced by the selected musicians during the comprehension research phase, the

goal was to use an inductive approach to explore and gather “individualized interpretations that describes the phenomenon being studied” (Creswell, 2018).

Research Type

This study followed an exploratory and inductive approach to generate theories on how technology can be leveraged by independent or DIY musicians via the collected data. Contrary to a deductive approach which tended to be confirmatory of an already established theory, inductive research focused on extrapolating what was mentioned in the existing literature along with collected data via the selected research method to draw conclusions (Creswell, 2018).

Research Strategy

The research strategy followed the phase gate approach. The phase gate approach is an open idea process that was used to guide this project from conception to completion. Planning the research activities from a project perspective, each phase had to be reviewed to move on to the next, evaluating “specific criteria [that] had to be met to determine the success of [the] phase and the ongoing viability of a project” (Nicky Daly, 2022).

In the phase gate method, each stage and its respective activities were completed and then followed by a checkpoint which was referred to as the “gate." The name and number of the phases could vary depending on the project. This study consisted of three (3) phases named “Phase 1”, “Phase 2”, and “Phase 3,” respectively. At the “gate,” a decision was made to “either move forward, make modifications [to the phase’s result(s)] before advancing, or end the project” (Nicky Daly, 2022). This study followed the phase gate approach because the check-in step needed at the “gate” ensured that efficiency of the project remained a high priority (Nicky Daly, 2022). In efforts to increase the likelihood of the project’s success, the decisions required at the gate ensured that the

project completed the necessary research activities needed to advance the study toward a resulting, conclusive phase.

Phase 1

Background and Goals.

Phase 1 intended to gain understanding and comprehension of the research participant's individual perspectives and methods highlighting how independent, or DIY musicians can leverage the musical technology to advance their careers -- a gap revealed in the existing literature. To complete this objective, phase 1 consisted of a series of user interviews, a popular research method within qualitative studies (Creswell, 2018). The goals of this study were to:

1. Gain a clear understanding of the tools and technologies currently being leveraged by independent, or DIY musicians.
2. Investigate how these tools and technologies were adding value to the musical careers of independent, or DIY musicians
3. Discuss the strengths and weaknesses of these tools and technological innovations
4. Learn how these digital tools and technologies made independent, or DIY musicians feel about their musical careers
5. Uncover the gaps, if any, within tools and technologies, and provide advantageous recommendations that would benefit the independent, or DIY music career.

Interview Questions.

Another aim of this study was to answer the following open-ended questions:

1. What digital music tools and technology are currently being leveraged by independent or DIY musicians?
2. How do these tools and technology add value to the independent, or DIY musicians' careers or their musical process?
3. What are independent, or DIY musicians' experiences with these tools and technologies?
4. What are the strengths and weaknesses of each of these tools and technological innovations?
5. How do these tools and technologies impact the way independent, or DIY musicians feel about their musical careers?
6. What is missing from these tools and technological innovation, or lack thereof, that would be beneficial to the independent, or DIY music career?

Interview Participants.

The participants of this study were 8 individuals apart of the independent or DIY music community chosen on a convivence sampling basis. Convenience sampling is a non-probabilistic sampling technique where the researcher selects subjects for the study based on their availability and ease of access. In this method, the researcher does not use a systematic or random approach to select the sample, but rather selects individuals who are readily available and willing to participate in the study. This method is often used when time or resources are limited, but it can lead to a sample that is not representative of the population being studied. Though I had relationships with several members of this community, to eliminate sampling bias, participants came from various Facebook community groups that catered to this group. A limitation of this strategy was that I was only able to select participants from Facebook communities that I was permitted to join and advertise my search for participants. Another limitation was that since the sampling

method was voluntary responsive, the participant demographic range may have been skewed. Each participant, however, was compensated $25 USD via a Visa Gift Card for the participation and time.

Interview Structure.

Participants were invited to answer questions via Zoom in one-on-one sessions. Prior to beginning the interview, participants were asked to read and sign a consent form. To ensure efficiency of the research activities, an interview guide was created and followed that served as a checklist for action items needed to complete the interviews successfully. An interview script was also prepared to follow the order of the interview. Interview responses were captured via Microsoft Word to be later transcribed for analysis. The interview order went as follows:

1. Introduced the interviewer, participant, background and goals of interview
2. Answered participant questions (if any)
3. Asked interview questions
4. Recapped the interview and shared next steps
5. Dismissed the participant

Decisions and Outcomes at the Gate.

The outcome of Phase 1 was a collection of research interview data collected over a span of 2 weeks. This data influenced the decision at the gate --- can qualitative analysis of the data be conducted?

Phase 2

Background and Goals.

Phase 2 intended to analyze the collected data to uncover commonalties and themes that emerged from participant responses to the interview questions. This analysis served as an influence on the results later shared in Phase 3. This section shared a detailed overview of the data analysis technique chosen and its benefits as they related to the shared analysis process.

Analysis of Interview Data.

The data analysis method chosen for this study was thematic analysis. Thematic analysis is “an increasingly popular method for analyzing qualitative data…” (Thompson, 2022). Thematic analysis was selected for this study because of its usefulness in unpacking subjective experiences as they related to the research questions. (Braun & Clare, 2006). In addition, interviews typically generated large bodies of qualitative data which were easier categorized using a thematic analytical approach.

Thematic analysis was exercised in this study via inductive coding. Inductive coding is considered a bottom-up technique where codes were not prematurely created, but instead, were developed as analysis of the dataset took place. A “code” is a label assigned to a piece of text (i.e., an interview response) that represented an important concept or theme within the set of interview data. (Braun & Clare, 2006). By uncovering themes, or “codes”, within the data set, meaning was identified through interpretation of these patterns within the qualitative data captured. (Braun & Clarke, 2006).

Inductive Coding Process.

To inductively code the data, preparation and organization of the interview data was required. The collected interview responses were transcribed into single-cell rows in Microsoft Excel to have a holistic record of all interview responses. Next, each response was reviewed and explored to identify common themes that could relate interview responses. The themes were recorded in a separate Excel column that related to the responses and were given a code for identification. These initial codes were assigned to each response derived directly from the generated themes, and the responses were reviewed once again to collate codes as much as possible. Once codes were collated, we reevaluated and revised the assigned codes, as needed, to finalize the coding process. Each code and its corresponding theme were then statistically quantified to highlight the frequency of themes within the participant's response and their respective proportions to the total record of response themes. Data visualization was provided to represent the proportion data. (Thomas, 2003.)

Decisions and Outcomes at the Gate.

The outcome of Phase 2 was a research narrative derived from coded data. The research narrative highlighted relationships within the coded data which were instrumental in articulating thematic results and responses as they related to the research questions. The decision at the gate answered the following question: What common themes, topics, ideas and patterns of meaning from the research data have been identified, and can these commonalities be shared and discussed further?

Phase 3

Background and Goals.

Using a combination of qualitative and quantitative approaches to present the data, Phase 3 conclusively shared the "story" or research narrative of the interview data. This phase objectively presented the findings of the data analysis and further discussed these findings to interpret their meaning as it related to the research goals.

Decisions and Outcomes at the Gate.

The outcome of Phase 3 will be a resulting qualitative and quantitative representation of the data. At the gate, Phase 3 will decide if the resulting data has been objectively and neutrally presented and discussed in a cohesive and efficient manner strong enough to accurately depict the research narrative and its meaning.

Chapter 4: Results

The purpose of this study was to identify the Digital Music Technology stack leveraged by independent musicians to complete certain post-production activities for their musical career. It further investigated six research areas to suggest how the Value, Years of Experience, Strengths and Weaknesses, and Impact this tech stack provides might aid or hinder the advancement of independent artist's musical careers. In addition, questions regarding the artist's unmet needs from the leveraged technology that might help independent musicians were raised.

For this study, a total of eight semi-structured interviews were completed. 14 structured questions were asked during each interview, and based on the participant's responses, one or more additional questions may have been asked to supplement. These interviews sought to answer the aforementioned research questions: 1) What music tools and technology are currently being leveraged by independent or DIY musicians?; 2) How effective are the tools and technology?, 3) what are the strength and weaknesses of each of these tools and technological innovations?, and 4) what is missing from these tools and technological innovations (or others) that would be beneficial to the independent or DIY music career? Using a combination of illustrative quotes, tables, and charts, this chapter will present the interview findings by highlighting themes that were homogeneous amongst the interview participants' responses to the six research areas.

The sample of eight participants ranged in age from 23 to 33, with seven falling into the 20-to-29 age range and one falling into the 30-to-39 age range. Male participants were on average 27 years old, whereas female participants were on average 24 years old. All participants were recruited through Facebook groups that were created to support the independent music community. Any musician or musical band that is not contracted to a record label is considered to be a member of the independent musician community. Other

names for this group of people include indie artists and musicians and unsigned artists and musicians.

Table 1

Demographics of interview participants

Participant	Gender	Age	Age Group
1	Male	28	20-29
2	Male	24	20-29
3	Female	23	20-29
4	Male	24	20-29
5	Male	25	20-29
6	Male	33	30-39
7	Female	24	20-29
8	Female	24	20-29

Question 1: The Digital Music Technology Toolset of Independent Artists

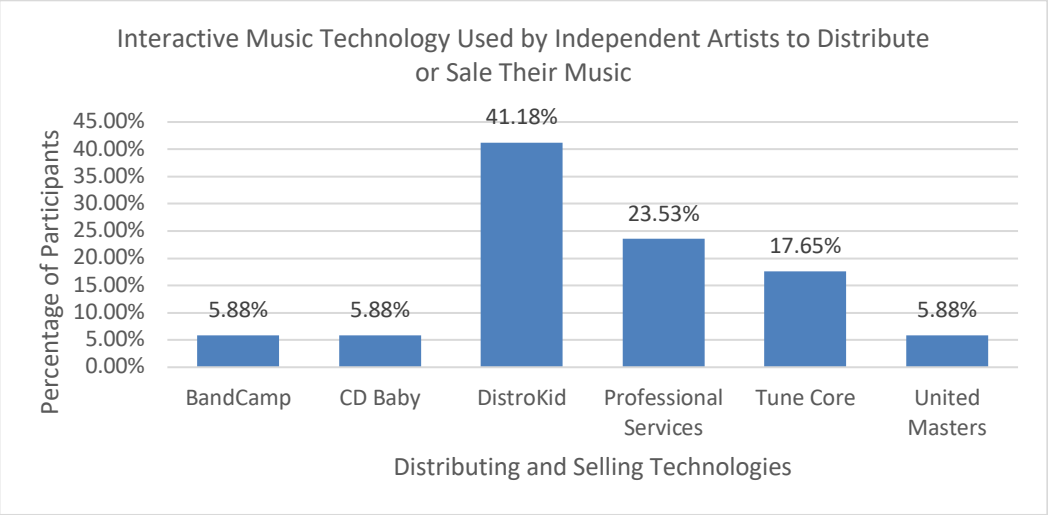
This section will present the results of the Digital Music Technology that the sample of independent musicians currently leverage. Beyond the scope of the interview questions, neither the history of these technologies nor an explanation of their use will be shared.

Distributing and Selling Technologies.

Bandcamp, CD Baby, DistroKid, Professional Services, TuneCore, and UnitedMasters were among the few thematic technology platforms that the independent artists interviewees frequently use to sell and distribute their music. Participant 4 shared that "DistroKid...[is] an internet platform [he utilizes] to be able to distribute [his] music to all streaming platforms." DistroKid was cited by four participants, or 41.18 percent, as their preferred method of distribution and sales while Professional Services followed, as 23.53 percent of the sample noted leveraging this technology. Participant 2 agreed sharing that the "technology [he uses] to distribute [his] music is [also] DistroKid." By leveraging this technology, Participant 2 is "able to upload…music through Spotify, Apple Music, Tidal, all these streaming platforms are coming out. And then as…more music platforms come on to the music industry, [his] music will get upload onto there as well."

Chart 1

Bar Chart of Digital Music Technology Used by Independent Artists to Distribute or Sale Their Music



Marketing and Promoting Technologies.

The independent musicians interviewed frequently use technologies, such as Google, BandInTown.com, artist/band websites, email campaigns, and social media to market and promote their music. Five participants, or 53%, said that social media platforms were their primary method of marketing or promoting their music, but 20% of the participants also mentioned using mobile applications. Twitter, YouTube, Facebook, TikTok, Spotify for Artists, and Instagram were themes of social media channels that the majority of interviewed independent artists' use:

> "We live in an age where, you know, everybody's using social media to market. [W]e started off way back, you know, on like Facebook, we don't really use Facebook as much anymore. Not really many people do. But we kind of used

Facebook. We use Instagram to market our music probably the most. We should be using Tik Tok a whole lot more because that's really what everybody seems to be using to market music, but we have a presence on there." – Participant 5

Chart 2

Bar Chart of Digital Music Technology Used by Independent Artists to Market or Promote Their Music

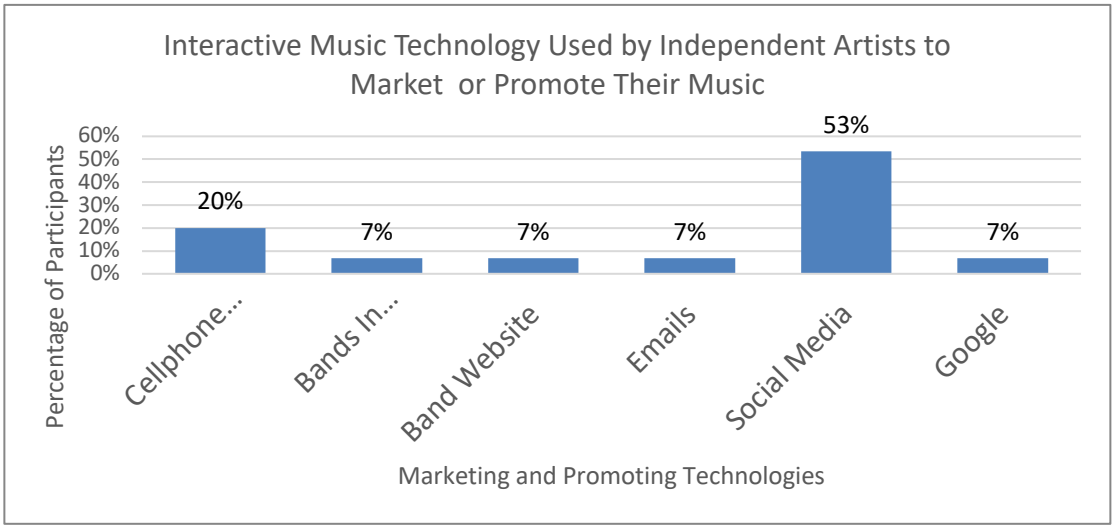
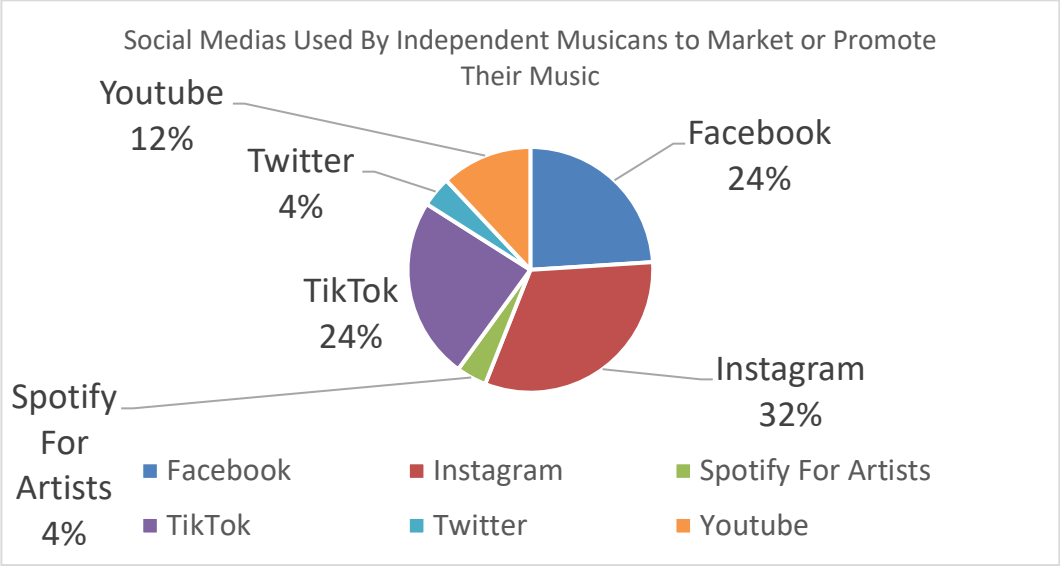


Chart 3

Pie Chart of Social Medias Used by Independent Artists to Market or Promote Their Music



Arranging and Recording Technologies.

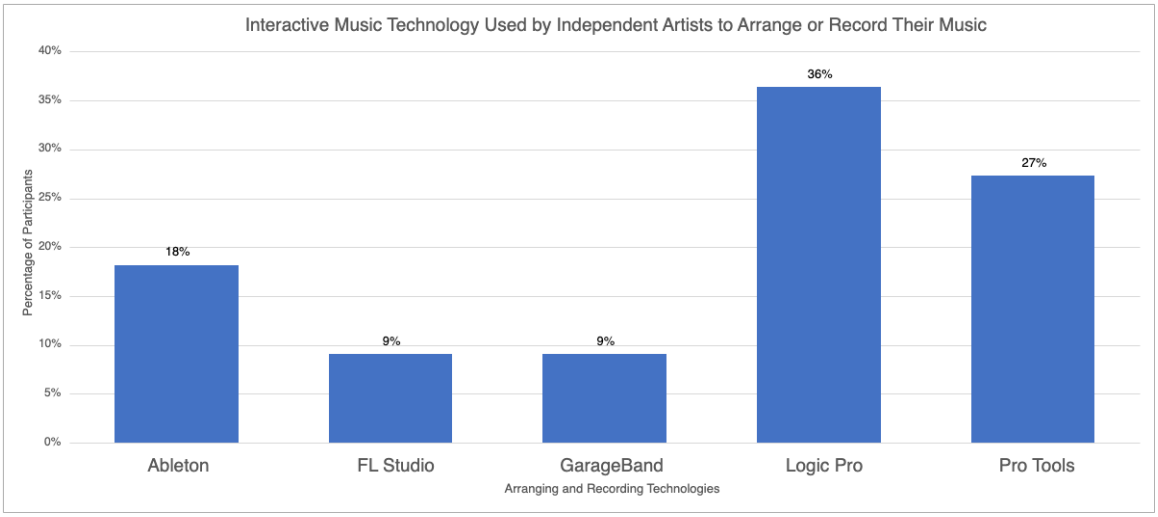
Themes found amongst the technologies leveraged by the sample of independent artists to arrange or record their music include Ableton, Logic Pro, Pro Tools, FL Studio, and GarageBand. Participants frequently mentioned Logic Pro as their preferred arrangement and recording software:

> "I use Logic Pro, which is specific to Apple computers. I've used Logic for the past 10 years. Whenever we would go to studios to record and like other people would record us, they would usually always use Pro-Tools. But for like the past three or four years, I have been recording and producing our music and I use logic Pro. I love using logic Pro." – Participant 5

As Participant 5 shared, Pro Tools was another shared standard amongst participants who, like Participant 1, contended that “when [their] recording, [they] use Pro-Tools.”

Chart 4

Bar Chart of Digital Music Technology Used by Independent Artists to Arrange or Record Their Music



Miscellaneous Technologies.

Independent artists also use mobile Voice Memo programs to record song ideas and samples (pre-existing recordings of another musical composition) from the cloud-based music creation and collaboration portal "Splice.”

> “So, we use this one thing called Splice, I know that you know what Splice is but for the interview, we use Splice for, like, samples, whether it'd be like, drum sounds to add on, or it'd be like an actual like loop of music that somebody's put on there that we can mess with and kind of fit within our music.” – Participant 5

DSLR cameras are another option for creating video content.

> "I will say DSLR camera to record music videos that we end up putting on YouTube. We have a in house guy that we work with…" – Participant 4

Questions 2 – 4: Value of the Independent Artist's Digital Music Technology Toolset

This section will present the value outcomes provided by the interviewed independent artists' Digital Music Technology by investigating what aspects distinguish these technologies from others, what factors led to the decision to use these specific technologies, and how these technologies aid in the achieving the artist's goal(s).

When asked what distinguishes these technologies from others, some of the common response keywords or phrases that emerged were affordability & budget-friendliness, catering to artist needs, convenience, uniqueness, experience, familiarity, manageability, offerings and opportunities, credibility and reliability, resourcefulness, ease-of-use and intuitiveness. Among these similarities, the credibility and reliability of the technology was a commonly stated distinguishing factor:

I think, specifically, with like Logic Pro, even though there's a bunch of recording software and production software that people use…, Logic is something that I kind of used because [it had] some credibility or some, like, type of a claim that it was, you know, a good software and it's not easy to use, but you know, it's reliable." – Participant 3

Table 2

Codes and Code Frequencies I

Codes	**Frequency of Codes (%)**

Credible & Reliable	19%
Convenience	14%
Ease-of-Use & Intuitiveness	14%
Affordable & budget-friendly	10%
Resourceful	10%
Catered to artist needs	5%
DIY	5%
Experience	5%
Familiar	5%
Manageable	5%
Offerings & Opportunities	5%
Uniqueness	5%
Total	**100%**

When asked what considerations influenced their decision to utilize these specific technologies, some of the most prevalent responses were convenience, ease-of-use and intuitiveness, experience, industry-standards and credibility, pricing, speed, strategy, and peer recommendations. The most often reported factor among these shared qualities was pricing.

Table 3

Codes and Code Frequencies II

Codes	**Frequency of Codes (%)**
Pricing	30%
Ease-of-Use & Intuitiveness	20%
Convenience	15%
Experience	10%
Industry-standards & Credibility	10%
Speed	5%
Strategy	5%
Peer Recommendations	5%

Total	**100%**

When asked how these technologies aid in the achieving the artist's goal(s), making high quality and perfectionism, professionalism & industry-ready, self-financing career, reach & strengthening fanbase, branding & marketing, storytelling, saving money were among the most common responses shared by the interview participants. A shared amount of the sample claimed that their goals were to create high-quality, professional-sounding music as well as reach more fans to strengthen their fanbase, and that the technology in their toolkit helps them achieve these goals:

> "So, the goal is to make high quality, like good quality music and at the same time, reach as many people [and] reach as many ears as I can as possible so I feel like Pro Tools is the program compared to others in my opinion that can help me make that high quality sound that that I want my fans to hear. And then I just feel like as of right now, like Instagram and TikTok are there, …people are on there all the time. So, I feel like because of that reason, it helps me you know, it helps me reach my goal, which is reaching more listeners gaining more fans." – Participant 8

Questions 5 – 7: Independent Artists' Experience with Digital Music Technology

This section will outline the results of how long participants have used their toolkits, how they acquired the skills to use the toolkit's technology, and how they learned about the toolkit's technology in order to present the sample's distribution of experience levels with the Digital Music Technology they currently use.

When it comes to how long they've been using their toolkits, the interviewed varied in years of experience from 2-3 years to 18-19 years, with 38% of them lying

between 3 and 4 years. With these years of experience, 64% of the sample said that self-taught informal education was their most frequent source of knowledge, with YouTube acting as their main source of didactic information on the technologies included in the artist's toolkit. Due to word-of-mouth being mentioned by 43% of the sample, it serves as the main way to hear about these technologies.

Table 4

Experience of interview participants

Participant	**Years Of Experience**	**Source of Experience**	**How'd you hear about these tools?**
1	3-4 years	Formal Education & Mentorship	School & Mentor
2	7 years	Self-Taught -- Informal Education	Word of Mouth & Online
3	2-3 years	Self-Taught -- Informal Education & Asking other Musicians	Word of Mouth & Online

4	3-4 years	Self-Taught -- Informal Education & Asking other Musicians	Word of Mouth, Online, & Email
5	10 years	Self-Taught -- Informal Education	Word of Mouth
6	18-19 years	Self-Taught -- Informal Education	Word of Mouth & Online
7	2-3 years	Self-Taught -- Informal Education	Online
8	3-4 years	Self-Taught -- Informal Education	Word of Mouth

Questions 8 – 10: Strengths & Weakness of the Independent Artist's Digital Music Technology Toolset

This section will present the interview findings on the strengths and weaknesses of the Digital Music Technology that the sample of independent artists currently use. This section will not contrast these strengths and weaknesses in an attempt to draw conclusions about their rationale or impact as this is outside the scope of the interview questions.

Distributing and Selling Technologies

Thematic strengths of the distribution and selling technologies used by the interviewed independent artists were intuitiveness, price, simplicity, reach, Indie-friendliness, and efficiency. Service offerings, on the other hand, were a commonly themed weakness of the distribution and selling technologies employed by the interviewed independent artists.

"Using DistroKid as a platform to release music…It's very intuitive. You have access to the statements; you don't need to have to audit books from a label or anything like that. [It] basically puts the tools into your own hands. That's a major strength… having the tools of a label services company without having to hire an outside hand and having to do all that kind of auditing and all the back and forth…. But I mean, there are some tools maybe to help promote the music, but in terms of sales, that would be a weakness, I would think would be just not having that. Like, a more traditional label services company, like something like a wall, or United masters has partnerships with other companies, with corporations with licensing companies and things like that, to basically increase the upward mobility of potential talent, as they you know, as talent develops, having the option to market the music further, etc. I think that would be a weakness for the technology I'm currently using." – Participant 6

Four participants highlighted intuitiveness as a significant strength of their chosen method of distribution and sales, while Service Offerings was cited by 80 percent of the sample's responses as a major weakness.

Marketing and Promoting Technologies.

Reach potential was noted in answer more than half of the time as a themed strength of the marketing and promotional technologies utilized by the interviewed

independent artists. Participant 4 shared that "[this] strength is that you can reach people that you could never reach before. That's just the strength of the Internet." Participant 8 agreed contending that "TikTok does reach…a lot more people for a smaller amount of money."

The weakness of the marketing and promotional technology used by the sample, on the other hand, was frequently cited as being social media algorithms. Participant 7 shared that "[social media] is a weakness in itself." She believes that social media can "feel really unauthentic [because] sometimes the algorithms are just kind of tricky."

Arranging and Recording Technologies.

Usability was mentioned as a thematic strength of the arranging and recording technologies used by the interviewed independent musicians more than half of the time with Participant 7 sharing how straightforward [her technology] is set to up and use." Stability was a major weakness mentioned in 40% of participant's responses which was described in-depth in the response of Participant 6:

> "The weaknesses for the tools that I use to [record] and arrange music would be stability. Sometimes just even using like a Mac Pro. With 8 gigabytes of RAM, there are times where I will run the computer a bit hot or like to where it's maybe not responding as quickly as it might have if I were running a smaller session, basically. So, stability can sometimes become an issue with audio dropouts, or the program just kind of dropping and having to be shut down or, you know, absolute worst-case scenario having to restart things or stuff like that…Then in terms of weaknesses, I think the main one is just, yeah, just that technology is still as amazing as it is, sometimes it will behave in a way that I don't anticipate it being a, like an experienced user, someone who's been using the program for, you

know, 10 plus years, sometimes it still does things that I don't expect. So sometimes its stability could be weakness."

Questions 11 -13: Impact of the Independent Artist's Digital Music Technology Toolset

This section will present the impact outcomes provided by the interviewed independent artists' Digital Music Technology by investigating how the sample feels about their musical careers when their toolsets are performing at their best\worst and how they'd feel if their toolsets were eradicated. Word clouds will be leveraged to illustrate the varying range of feelings shared by participants.

Participants reported that when the Digital Music Technology included in their toolkit's functions at their best, they often feel confident, hopeful and helped. In agreement with this hopeful optimism, Participant 2 stated that when these tools are working at their peak, "[independent artists] know] there's a chance that [their] music will be discovered even if it's not now but...eventually people will come across it."

Figure 1 Word Cloud of Participant Feelings When Digital Music Technology is Performing at its Best

In opposition, participants commonly shared that when the Digital Music Technology included in their toolkit's functions at their worst, they often feel inconvenienced, frustrated, and discouraged. Participant 8 shared in this frustration as she contended that "[she] feel hopeless. … because… [she] really realized how much [she] depended on these apps to get [her] music out. And so, if [she] can't get [her] stuff out, it's just like frustrating!"

Figure 2 Word Cloud of Participant Feelings When Digital Music Technology is Performing at its Worst

The participants generally agreed that not having access to technology in their musical toolkit any longer would have an influence on how they felt about their musical careers by pushing them to rethink their strategies or make them feel out of date in contrast to contemporary norms.

Figure 3 Word Cloud of Participant Reactions if the Digital Music Technology was Eradicated

Question 14: What's Missing from Digital Music Technology

This section describes what the participants homogenously concluded was lacking from the available music technologies. Common themes shared by participants include promotion- options, eliminating the knowledge gap, and pricing amongst others.

Table 5

Codes and Code Frequencies III

Codes	**Frequency of Codes (%)**

Promotion-Options	24%
Eliminate The Knowledge Gap	19%
Pricing	14%
Indie Artist Support	10%
Intuitiveness & Functionality	10%
Scam Detection	5%
Transparency	5%
Packages	5%
Branding	5%
Community	5%

Conclusion

This chapter presented the results of the 8 semi-structed interviews while the next chapter will discuss the analytic interpretation of these results in efforts to illustrate the relationship between the interview findings and the interpretation of the data.

Chapter 5: Discussion

Summary of Study

This study sets out to discover how independent musicians are currently utilizing music technologies. This investigation also sought to understand the effectiveness of this technology along with the advantages and disadvantages of each invention. Finally, another objective of this research was to determine what was lacking from these technological advancements (or others) that might help independent musicians' musical careers.

I begin this section with a reminder of the motivation driving this study as well as the methods used in addressing each research question. I follow with a summary and disc ussion of the results of each interview question.

Summary of Motivations and Methods

Digital Music Technology involves the use of any device, machine, or software system by a musician to make or perform music, compose, notate, playback, or record music, and/or analyze and edit music. Research centered on this subject has established that Digital Music Technology has and will continue to be an integral part of the music creation process. However, the current scope of Digital Music Technology research is limited to mainstream pre- and post-production responsibilities that are performed by

popular musicians and their teams to arrange, record, publish, distribute, sell, market, and promote their releases effectively. To address these gaps in the literature, I asked interview questions centered around the following six areas of research:

1. Digital Music Technology Stack
    a. What Digital Music Technology do independent artists use to distribute and sale, market and promote, & arrange and record their music?
2. Value
    a. What makes this technology stack toolset "special" or unique?
    b. What aspects or facets of this technology stack did independent artists consider when selecting the tools and technologies they selected?
    c. What are independent artists' goals when using technology and how do this technology help accomplish these goals?
3. Experience
    a. How long have independent artists been using the technology apart of your musical toolset? How did they learn to use it? How did they hear about it?
4. Strengths and Weaknesses

   a. Of the Digital Music Technology independent artists use to distribute and sale their music, what are the strengths of these tools? Weaknesses?
   b. Of the Digital Music Technology independent artists use to market and promote their music, what are the strengths of these tools? Weaknesses?
   c. Of the Digital Music Technology or services independent artists use to arrange and record their music, what are the strengths of these tools? Weaknesses?

5. Impact
   a. How do these tools and technologies impact the way independent artists feel about their musical careers when the tech stack is performing at its best? At its worst?
   b. If the technology stack didn't exist, how would that impact the way independent artists feel about their musical career?

6. What's Missing
   a. What aspects could improve the technology stack that could benefit the independent artist's musical career?

I explore these research areas using data collection from 8 semi-structured interviews with independent artists who were requested to participate and given research background information before offering their distinctive viewpoints and experiences in response to 14 participant interview questions. Following the conclusion of the interviews, thematic analysis of the data was used to help uncover, analyze, and understand patterns of meaning within the qualitative study.

Summary of Results

One of the primary findings of the research indicated that the sample of independent musicians primarily employed Distrokid, and social media, and Logic Pro to distribute or sell, advertise or promote, and arrange/produce or record their music, accordingly. The data also reveals that this technology stack is valued by its credibility and reliability, reasonable pricing, and aid in helping artists achieve their goals by enabling them to create high-quality, professional music and reach as many listeners as possible. Data suggests this tech stack was found impactful because it made the independent artist feel confident, helped, and hopeful when performing at its best opposed to feeling inconvenienced, frustrated and discouraged when performing at its worst. According to data, if the tech stack was nonexistent, this would eventually compel the artists to rethink their strategies or risk feeling out of date.

The data confirms the hypothesis that, when it came to the technology utilized to distribute and sell their music, intuitiveness was a key strength and service offerings were a detrimental flaw. In addition, the data suggests that, of the technology utilized to market and promote indie artists' music, the high potential for listener/fan reach is a primary strength, while social media algorithms were recognized as detrimental disadvantages. According to the statistics, usability was noted as the technology's main strength, but stability was noted as a negative flaw when it comes to how it is utilized to compose, arrange, or record independent artists' music. The data indicates that what's lacking from the suite of technologies used by independent musicians is promotional service offerings and addressing the knowledge gap.

Interpretation of Results

Research interest 1: Digital Music Technology Stack of Independent Artists

My analysis of the Digital Music Technology stack employed by the sample of independent artists revealed that these independent musicians primarily use DistroKid, social media, and Logic Pro for the various aspects of their musical careers. Specifically, they use DistroKid to distribute and sell their music, and they use social media to advertise and promote it. Additionally, they use Logic Pro to arrange, produce, and/or record their music.

These findings have important implicants for independent artists as these tools are essential for independent musicians to effectively manage and grow their careers in the

digital age. Furthermore, these implications are consistent with previous search reports contending that the findings that the musicians in the sample primarily relied on these tools for these purposes highlights the importance of distribution, promotion, and production in the music industry, and the ways in which technology is shaping the way independent musicians approach these tasks (Kärkinen 2021).

One important implication of the Digital Music Technology leveraged by independent artists is its potential to facilitate the distribution and promotion of their music. According to a recent study by Ahern (2019), independent musicians who use online platforms and tools, such as Distrokid and social media, are more likely to gain popularity thus resulting in a larger investment into their fanbase making more people like their music. This suggests that Digital Music Technology can provide independent artists with valuable opportunities to share their music with a global audience and connect with potential fans.

Another relevance of the Digital Music Technology used by independent artists is its ability to enhance the creative process and improve the quality of their music. A study conducted by Researchers Elena Partesotti, Jônatas Manzolli, & Alicia Penalba in 2017 found that musicians who use digital tools, such as software for recording and arranging, are more likely to experiment with different sounds and styles, and to produce music that is more complex and innovative. Based on these findings, some tangible goals for an independent musician could include: 1) improving the quality of their music through the use of digital tools and software for recording and arranging, 2) experimenting with different sounds and styles to enhance their creative process, 3) producing music that is more complex and innovative by utilizing Digital Music Technology resources, and 4) exploring their creativity and developing their artistic vision through the flexibility provided by Digital Music Technology.

Research interest 2: Value of the Independent Artist's Digital Music Technology Stack

The thematic analysis of how Digital Music Technology is valued by the sample of independent artists revealed that credibility and reliability, convenience, and ease-of-use and intuitiveness were the most important factors for this group of musicians. This suggests that independent artists place a high value on the trustworthiness and consistency of the technology they use, as well as its ability to save time and effort, and provide a seamless and intuitive user experience. These findings align with previous research on the factors that influence the adoption and use of technology in the music industry (Kärkinen 2021) and highlight the importance of these factors for independent musicians. This implies that independent musicians are more likely to be interested in technology that is well-established and has a track record of success than they are in experimental or unproven tools.

Additionally, the emphasis on convenience and ease-of-use indicates that independent artists are looking for technology that is intuitive and easy to learn, which can help them achieve their goals by positioning these artists to produce high-quality, professional music to attract as many listeners as possible. These insights can be useful for designers and developers of Digital Music Technology, as they can inform the design and marketing of new tools and services.

Research interest 4: Strengths & Weakness of the Independent Artist's Digital Music Technology Stack

Thematic analysis revealed that service offerings were a negative defect, and that intuitiveness was a major strength of the technology the sample of independent artist used to distribute and sell their music. The finding that independent artists appreciate

technology that is easy to learn and use, and that does not require a steep learning curve or complex technical knowledge, suggests that UX designers working in the Digital Music Technology industry should focus on creating user interfaces and features that are intuitive and easy to use, in order to provide a better user experience for independent artists. This agrees with previous research that suggests intuitive technology can help independent artists save time and effort and can make it easier for them to focus on creating and promoting their music. (Ahern 2019). By designing technology that is intuitive and user-friendly, UX designers can help independent artists to make the most of their time and resources, and to focus on their artistic goals and objectives.

One possible explanation for this negative perception of service offerings is that independent artists may feel that the technology does not provide sufficient options or features for distributing and selling their music. For example, DistroKid does not support certain formats or platforms, and lacks advanced features such promotion and marketing services. Alternatively, Digital Music Technology may be difficult to use or may have a limited range of support or customer service. These issues can make it challenging for independent artists to effectively distribute and sell their music, which can impact their ability to reach a wider audience and generate revenue – goals and objectives shared by the sample of artists. In addition, thematic analysis revealed that, of the technology utilized to market and promote indie artists' music, the high potential for listener/fan reach was a primary strength, while social media algorithms were recognized as detrimental disadvantages. The finding that the high potential for listener/fan reach is a primary strength of the technology used by independent artists to market and promote their music suggests that this group of musicians values the ability of the technology to connect them with a large and diverse audience. This indicates that independent artists are likely to prioritize technology that is widely used and popular, and that has a strong

reputation and presence in the music industry. Research contends that independent artists may be more interested in technology that is supported by major streaming platforms or social media networks, as these can provide access to a larger and more diverse audience (Amedeo 2009).

On the other hand, the finding that social media algorithms were recognized as detrimental disadvantages indicates that independent artists are concerned about the potential negative effects of these algorithms on their music and their careers. Social media algorithms are the automated processes that determine which content is shown to users on social media platforms, and they can have a significant impact on the visibility and reach of independent artists' music. For example, social media algorithms may prioritize content from established artists or from users with many followers, which can make it difficult for independent artists to gain visibility and attract new fans. This can be a major obstacle for independent artists, as it can limit their ability to reach a wider audience and to promote their music effectively (Murphy, 2015).

Research interest 6: What's Missing from Digital Music Technology Stack

Research analysis suggested that what's lacking from the suite of technologies used by independent musicians is promotional service offerings and addressing the knowledge gap. The finding that promotional service offerings are lacking in the technologies used by independent musicians suggests that this group of musicians may be dissatisfied with the options and features available for promoting their music. Independent musicians may feel that the technology they use does not provide sufficient tools or support for marketing their music, or that it lacks advanced features such as analytics or campaign management (Cole 2019). This can be a major challenge for

independent musicians, as effective promotion is crucial for reaching a wider audience and generating revenue.

The finding that the learning curve is an issue for the technologies used by independent musicians indicates that some technologies may be difficult to learn and use, which can make it challenging for independent musicians to fully utilize their potential. Independent musicians may struggle to understand the functionality and features of the technology, or they may need to spend a lot of time and effort to become proficient with it. This can be a major obstacle for independent musicians, as it can limit their ability to take advantage of the full potential of technology and to compete with established artists. This means that UX designers should design technology that is comprehensive and user-friendly, and that provides independent musicians with the tools and support they need to promote their music and to learn and use the technology effectively.

Chapter 6: Conclusion

This chapter concludes the study and summarizes the major results in connection with the objectives and research questions and analyze their importance and contribution. Additionally, it will discuss the study's limitations and suggest areas for additional research.

The goal of this study was to explore the Digital Music Technology leveraged by independent artists to advance their musical careers. The research questions were:

1. What music tools and technology are currently being leveraged by independent artists?
2. How effective are these tools and technology?
3. What are the strength and weaknesses of each of these tools and technological innovations? and
4. What is missing from these tools and technological innovations (or others) that would be beneficial to the independent music career?

To answer these questions, in-depth interviews were conducted with a sample of individuals who identify as independent artists. The resulting data was analyzed using qualitative coding techniques to identify recurring themes and patterns in the participants' experiences while leveraging their unique Digital Music Technology stack.

Summary of Results

The main findings of the study indicate that independent artists' experiences with Digital Music Technology are multifaceted. Several key themes emerged from the data suggesting that DistroKid, social media, Logic X Pro were the primary Digital Music Technology stack participants employed to distribute, promote, and record their music,

respectively. In addition, these themes highlight the ways in which independent artists' experiences with Digital Music Technology are shaped by a range of factors, including value, impact, years of experience, strengths and weaknesses, and what's missing.

Benefits and Contributions of the Study

One of the key implications of this study is that it provides a rich and nuanced understanding of independent artists' experiences with Digital Music Technology. It offers new insights into the ways in which these experiences are shaped by a range of factors, and how designing for this type of technology can be shaped for future advancement.

For the UX design community, Digital Music Technology can be improved with better accessibility and usability of this technology overall, increasing user engagement, producing distinctive audio identities for brands, and introducing unique and creative audio aspects. The independent or DIY artist community will also greatly benefit from this technology as they will be able to express their creativity more freely, improve the live performance experience, generate new revenue streams, increase audience engagement, and develop new musical genres and styles. Benefits for academics include new research opportunities, advancements in Digital Music Technology, the ability to draw new conclusions about music and technology, the development of new models for the production and distribution of music, the emergence of new interdisciplinary fields of study, and hands-on learning opportunities.

Limitations of the Study

At the same time, the study has some limitations that should be considered when interpreting the results. For example, our sample was relatively small, which may limit

the generalizability of our findings. Additionally, the data were collected through interviews, which may not fully capture the full range of experiences of independent artists. In addition, because qualitative research is often based on the researchers' interpretations and perspectives, there may be a degree of subjectivity in the findings. This can make it difficult to replicate the study or to generalize the results to a wider population, as well.

Another drawback of the study is the convenience sample's lack of diversity among participants, which raises the possibility of bias and must be acknowledged. Of the sample of participant's interviewed, majority were between the ages of 20 and 40, but there are undoubtedly many independent musicians outside of this age group who may have different perspectives about which technological platforms are best for their line of work to advance their careers.

Recommendations for Future Research

Despite these limitations, this study makes a valuable contribution to the field of Digital Music Technology by providing new insights into the experiences of independent artists in relation to Digital Music Technology. It offers a detailed and nuanced understanding of the factors that shape these experiences and highlights potential areas for further research. Overall, the findings of this study have significant implications for our understanding of independent artists and Digital Music Technology. This can inform future research in this area which could including conducting follow-up studies with a larger sample size to increase the generalizability of the findings. In addition, future research could include using multiple methods of data collection, such as interviews, focus groups, and observation, to triangulate the results and improve the validity of the study.

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