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The Music Recording Industry Supply Chain and Industry 4.0

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A Research Project report submitted to the Faculty of Engineering and the Built Environment, University of the Witwatersrand, in fulfilment of the requirements for the degree of Masters in Engineering.

Date: 18 October 2021

SCHOOL OF MECHANICAL, INDUSTRIAL & AERONAUTICAL ENGINEERING

PLAGIARISM DECLARATION

Name: Thabang Keele **Student no:** 0706681d

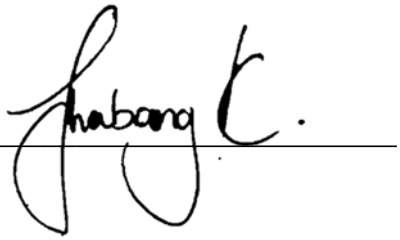
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ABSTRACT

The paper explores the impact of technological innovations on the supply chain of the music industry and the players in the industry. The study investigates how these changes have affected the management of the South African music industry's supply chain and its operations, most especially in the advent of the Fourth Industrial Revolution (Industry 4.0). The study focuses on four supply chain dimensions: (1) the structure of activities, (2) the choice of players, (3) the governing mechanism, and (4) the co-ordinating structure of supply chains.

The research indicates that the advent of the Internet has reorganised the industry and affected the way music is consumed. Technological innovations have opened new markets, created opportunities for new entrants and entrepreneurs to enter the market and offer a mix of new and already known services to the consumer. New offerings often require new partnerships, which in turn may change the network structure in the supply chain. With Industry 4.0 we have seen breakthroughs and innovations progressing at an exponential rate, bringing entirely new capabilities and possibilities for change.

The research sought to comprehensively analyse the structure of the traditional model of the industry and outline the changes that have developed within the South African supply chain using the four dimensions of supply chain design. The results show that the entrepreneurial technology companies, armed with a wealth of consumer data are gaining a major competitive edge over the traditional incumbents of the industry. The study outlines a new structure of the supply chain and describes how the creators and consumers of music will relate to each other in the future.

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TABLE OF CONTENTS

PLAGIARISM DECLARATION i
ABSTRACT ii
ACKNOLEDGEMENTS iii
TABLE OF CONTENTS iv
LIST OF FIGURES vii
LIST OF TABLES ix
ABBREVIATIONS AND ACRONYMS x
GLOSSARY OF TERMS xi
CHAPTER 1. INTRODUCTION 1
1.1. Background 1
1.2. Problem Statement 2
1.3. Research Questions 3
1.4. Objectives 3
1.5. Summary of Research Method 3
1.6. Ethical Issues 4
1.7. Limitations of the Research 4
1.8. Outline of Chapters 4
CHAPTER 2. LITERATURE REVIEW 6
2.1. Systematic Literature Analysis Method 6
2.2. The Music Industry Supply Chain 11
2.2.1. The structure of activities 12
2.2.2. The choice of players 14
2.2.3. The governing mechanism 16
2.2.4. The co-ordination structure 17
2.3. Technology Changes in the Music Industry Supply Chain 18
2.3.1. The Internet and the Mp3 19
2.3.2. Music piracy and Peer-to-Peer networks 22
2.3.3. The Digital Music Industry 25
2.3.4. E-Retailers 28
2.3.5. Streaming Music Services 29
2.4. The Impact of the Internet on the Music Industry Supply Chain 30
2.4.1. The structure of activities 30
2.4.2. The choice of players 31
2.4.3. The governing mechanism 33

2.4.4. The co-ordinating structure 34
2.5. Labels, Artist and Consumers 36
2.5.1. Major record labels 36
2.5.2. Independent labels 38
2.5.3. Artists 39
2.5.4. Consumers 43
2.6. The Fourth Industrial Revolution 44
2.6.1. Industry 4.0 and Supply Chain 47
2.6.2. Industry 4.0 and Music 48
2.7. Technology Companies in the Music Industry 51
2.7.1. Google and Youtube 51
2.7.2. Apple 52
2.7.3. Spotify 52
2.8. The South African Music Industry 53
2.8.1. The artists 54
2.8.2. The record labels 55
2.8.3. The trade 57
2.8.4. Revealers 59
2.8.5. Facilitators 60
2.9. Preliminary Conceptual Framework 65
2.10. Summary 66
CHAPTER 3. RESEARCH METHOD 67
3.1. Research Design 67
3.1.1. Data collection 67
3.1.2. Sample selection 70
3.1.3. Data analysis 71
3.1.4. Reliability and validity 74
3.2. Limitations of the Study 75
3.3. Ethical Issues 75
3.4. Summary 76
CHAPTER 4. FINDINGS AND ANALYSIS 77
4.1. Profile of Respondents 77
4.2. Interview Analysis: An Insider's View 81
4.2.1. The significant roles in the industry 82
4.2.2. Technology makes independent music and entrepreneurship viable 85
4.2.3. The increasing bargaining power of technology companies 89

4.2.4. The challenge of and need for transparency 90
4.2.5. The understated importance of Piracy and File-Sharing 92
4.2.6. The fragility of the Majors 94
4.3. Research Reliability and Validity 96
4.4. Chapter Summary 96
CHAPTER 5. DISCUSSIONS 97
5.1. Industry Knowledge 97
5.1. Industry 4.0 and the Supply Chain of Recorded music 98
5.1.1. Structure of activities 99
5.1.2. Choice of players 100
5.1.3. Governing mechanism 101
5.1.4. The co-ordinating structure 101
5.2. Chapter Summary 102
CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS 103
6.1. Conclusion 103
6.2. Recommendations 104
6.3. Limitations and Delimitations 105
CHAPTER 7. REFERENCES 106
CHAPTER 8. APPENDICES 113
Appendix A: Sample Letter to the Participants. 113
Appendix B: The Research Interview Model 114
Appendix C: Sample Interview Transcripts 118
Interview with Participnat No. 5. 118
Interview with Participnat No. 4. 127
Appendix D: Data Tables Used in the Analysis 138

LIST OF FIGURES

Figure 2.1. Distribution of publication types. 8
Figure 2.2. Distribution of publication year of cited in the document analysis. 8
Figure 2.3. Distribution of countries the publications were published. 10
Figure 2.4. Distribution of the research methods employed in the publications. 11
Figure 2.5. Basic Value Chain for cultural goods (Waltman, 2011) 13
Figure 2.6. A traditional music industry value chain (Graham *et al*., 2004) 14
Figure 2.7. Players in the value chain of the "traditional" music industry (Ricardo, 2017) 15
Figure 2.8. Traditional Music Industry Players (Graham *et al*., 2004)....15
Figure 2.9. Traditional Music Industry governance (Graham *et al*., 2004) 16
Figure 2.10. Traditional Music Industry co-ordination (Graham *et al*., 2004)....18
Figure 2.11. Traditional music structure (Parikh, 1999)....21
Figure 2.12. Post Internet music structure (Parikh, 1999) 25
Figure 2.13. Recorded Music Sales 1973-2012 (IFP, 2013)....26
Figure 2.14. Global Recorded Music Industry Revenues 2001-2019 (US$ Billions) (IFPI, 2020) 27
Figure 2.15. Global recorded music revenues by segment 2019 (IFPI, 2020) 28
Figure 2.16. An Internet music industry value chain (Graham *et al*., 2004) 31
Figure 2.17. Internet Music Industry Players (Graham *et al*., 2004) 32
Figure 2.18. Internet Music Industry Governance (Graham *et al*., 2004) 33
Figure 2.19. Internet Music Industry co-ordination (Graham *et al*., 2004) 35
Figure 2.20. US recorded music market share 2018 (IFPI, 2019) 36
Figure 2.21. The traditional model of services controlled by the majors (Hracs, 2012). 37
Figure 2.22. How consumers spend on music (Dos Santos, 2016)....44
Figure 2.23. South African recorded, live music and podcast revenue (R millions) and year-on-year growth (%), 2014-2023 (PWC, 2019) 53
Figure 2.24: Preliminary conceptual framework for the music industry and the influences on its supply chain. 65
Figure 3.1. CRQ - TQ - IQ: Pyramid Model (Wengraf, 2001)....68
Figure 3.2. A streamlined codes-to-theory model for qualitative inquiry (Seldana, 2015)....73
Figure 4.1. Age distribution of participant sample 78
Figure 4.2. Experience distribution of participant group. 78
Figure 4.3. Education level distribution of participant sample....79

Figure 4.4. Professional status of participant sample 80
Figure 4.5. Category distribution of participant group. 81
Figure 4.6. Relevance to the operation of participants in the past 5-10 years 82
Figure 4.7. Stakeholder's current interaction. 83
Figure 4.8. Stakeholder's future interaction 84
Figure 4.9. Strongest and weakest players in the South African music industry. 85
Figure 4.10. Difficulty to record and distribute music responses. 86
Figure 4.11. Social media footprint. 87
Figure 4.12. Social media platforms used for business activities. 88
Figure 4.13. Knowledge scale on the distribution of royalties. 91
Figure 4.14. Supersession of majors by technology companies. 95

LIST OF TABLES

Table 2.1. Types of articles cited in the document analysis. 7
Table 2.2. Publishing outlets of reviewed articles/journals/books. 9
Table 2.3. Publication countries of reviewed articles. 10
Table 2.4. Methods used in the reviewed articles. 11
Table 2.5. Structure of activities supply chain characteristics (Graham *et al.*, 2004). 30
Table 2.6. Industry player characteristics (Graham *et al*. 2004). 32
Table 2.7. Conventional vs. Digital Governing mechanism comparison (Graham *et al*. 2004). 33
Table 2.8. Conventional vs. co-ordination comparison (Graham *et al*. 2004). 35
Table 2.9. Music business model comparison from the artist's point of view (Dos Santos, 2016) 43
Table 2.10. South African recorded, live music and podcast revenue (R millions), 2014-2023 (PWC, 2019) 54
Table 3.1. Main characteristics of the participants interviewed in the study. 71
Table 4.1. Age composition of participant sample. 77
Table 4.2. Experience composition of participant sample. 78
Table 4.3. Education level composition of participant sample 79
Table 4.4. Professional status composition of participant sample. 80
Table 4.5. Category composition of participant group. 80
Table 8.1. Relevance of the industry players 138
Table 8.2. Music stakeholders' current interactions. 138
Table 8.3. Stakeholders' expected future interactions. 139
Table 8.4. Perceived strength of the players. 139
Table 8.5. Difficulty to produce and distribute a song. 140
Table 8.6. Social media footprint. 140
Table 8.7. Social media use for business activities. 140
Table 8.8. Perceived participant knowledge of royalties' distribution.. 141
Table 8.9. Likelihooh of majors being replaced by technology companies. 141

ABBREVIATIONS AND ACRONYMS

A&R: Artists and Repertoire

BMG: Bertelsmann Music Group

CAGR: Compound annual growth rate

CD: Compact Disc

DAW: Digital Audio Workstation

DVD: Digital Versatile Disc

EMI: Electric and Musical Industries

IFPI: International Federation of the Phonographic Industry

LAN: Local Area Network

MIDI: Musical Instrument Digital Interface

MP3: MPEG Audio Layer-3

OECD: Organisation for Economic Co-operation and Development.

P2P: Peer-to-Peer

PC: Personal Computer

RIAA: Recording Industry of America

RiSA: Recording Industry of South Africa

SAMRO: South African Music Rights Organisation

GLOSSARY OF TERMS

Digital Audio Workstation: a piece of software that allows you to compose, produce, record, mix, and edit audio and MIDI.

File Sharing: the act of sending files and data from one device to another over a network or over the Internet.

Musical Instrument Digital Interface: for performing, editing, and recording music, MIDI refers to a communications protocol, digital interface, and electrical connectors that link a broad range of electronic musical instruments, computers, and related audio devices.

MP3: a compressed audio file format that enables digital storage and transmission.

OECD: Organisation for Economic Co-operation and Development. There are 37 member countries.

Peer-to-Peer (P2P): file sharing that grants users' access to books, movies, music, games, etc. using file sharing software.

Pirating: unauthorised commercial copying or use of another's work for profit, typically in violation of a patent or copyright.

Vinyl: phonograph records made of a synthetic resin or plastic made of polyvinyl chloride or a related polymer.

CHAPTER 1. INTRODUCTION

1.1. Background

Music has been around for thousands of years; it has been a part of every culture and has pervaded every level of society and listening to music is a source of great entertainment for most people in today's era. However, music is a very serious business for the global music industry, with recorded music sales equivalent to US$20.2 billion in 2019 (IFP, 2020).

The production of music as a commercial product began in the 19th century with sheet music publishers dominating the industry. The rise of sound recording technology in the 20th century started to act as a disruptive innovation for the commercial interests of sheet music publishers (Attali, 1985). Disruptive Innovation, defined by Twin (2019) as a technology whose usage considerably affects the way a market or industry functions, was conceived and first analysed by Clayton M. Christensen and his collaborators in 1995 (Bower *et al.*, 1995) and has been called the most important business concept of the early 21st century (Bagehot, 2017).

During the 20th century the music industry saw a significant growth. The advance of music recording technologies, in the form of cassettes, CDs, DVDs, vinyl records, for example, have made music more accessible and created a global industry (Wikström, 2014). Ramkissoon (2012) observes that, “digital music in general has seen the world being exposed to much more music than was ever possible – music from the most obscure places being made available to the most obscure places – and the tiniest bands from a random town whose name we cannot pronounce can now be downloaded by someone who can make them famous by the click of a button.” (n.p)

According to Graham et al. (2004), while music as a physical product has changed significantly over time, the distribution mechanisms and division of labour within the industry have largely remained the same: musicians create music, record labels market, and distribute, and listeners consume the music. While this is the case, over the past few years, the way corporations have conducted and handled their business activities has undergone dramatic changes; this is particularly true of the music recording industry (Graham *et al.*, 2004).

Throughout the history of the music business, the big record labels have dominated the music industry in terms of both production and distribution (Graham *et al.*, 2004) and according to Pietila (2009), the ownership and control of the copyrights of musical works within the supply chain is an important factor. The power of major labels to dominate the music supply chain has built barriers to entry, preventing artists from releasing their own work independently. (Bielas, 2013). However, disruptive technologies, the advent of the Internet and related software developments have and are continuing to undermine the control major labels have on the industry as well as the solid foundations on which the industry has been based.

The scope of the disruptions caused by major innovations in the supply chain and its players, as well as the challenges encountered along the way, are examined in this study.

1.2. Problem Statement

Technological innovations of the 20th century have enabled new intermediaries and entrepreneurs to enter the music market and deliver a combination of new and existing services (Wikström, 2014). Unique services also necessitate new alliances, which can alter the business model and supply chain's network structure, impacting the stakeholders in the network. To cope with changes, gain a competitive edge, and react quickly to changing marketplaces, business leaders are increasingly adjusting to new business paradigms that allow them to work more closely with their traditional and new business partners, which include partners and customers throughout the supply chain (Schilling, 2017).

Technological advancements have transformed the environment of the music industry along with the rules of operation and competition. Businesses are now competing on a global scale, most especially now that the music chain of physical product circulation has become less essential (Graham *et al*., 2004).

The study sought to develop a more detailed understanding of how historical technological innovations have shaped the recording music industry in South Africa and how these innovations have affected the supply chain of music and the players within the industry. Similar studies indicate that digital age has brought about major changes to the structure and operation of the music industry’s supply chain. The issue is that there has not been a comprehensive analysis of the impact of newer technologies and the companies that are pioneering these game-changing inventions. The research also investigated how these

developments have influenced the management of the South African music industry's supply chain and how it is presently working, especially in the age of Industry 4.0.

1.3. Research Questions

The primary research question of this research can be expressed as:

- How has the South African music industry supply chain been impacted by technological innovations?

1.4. Objectives

The objectives of this research are to:

- Establish how the stakeholders in the music industry influence the music network?
- Identify how the different types of technological innovations, heading into the fourth industrial revolution; have presented challenges and opportunities to the players in the South African music supply chain.
- Establish a future position for the industry supply chain, as seen from the perspective of the players in the South African music industry supply chain.

1.5. Summary of Research Method

This study employed an exploratory research design. Cooper *et al*. (2014) define exploratory research as a study conducted when there is inadequate information or research on problems or research topics that have previously been addressed. This research design was preferred to investigate and gain greater knowledge of the technological advancements in the South African recorded music supply chain.

The data required for this research was collected by means of a document review and semi-structured interviews. The information for the document review came from the literature and previous work of other scholars on the topics of music, technological advancements in the music industry, Industry 4.0, and supply chain management. The interviews were employed to obtain a perspective of the networks and business model types of the different industry participants. The target population for this study were music industry stakeholders in the Johannesburg region. Snowball sampling was used to locate the participants for interviews (Cooper *et al*. 2014). The sample size for this study was 12.

By extracting themes from the interview transcribed documents, a qualitative thematic analysis was conducted using Coding as a systematic way to classify any differences that appear in empirical evidence.

1.6. Ethical Issues

Ethical clearance was obtained from the School of Mechanical, Aeronautical and Industrial Engineering's Ethics Committee before data collection proceeded. The ethics clearance number for this research report is MIAEC 113/20. Throughout the research review, the researcher maintained objectivity, fairness, and impartiality. Interviewees were assured of their privacy and that the information they provided would be kept private. They were also told that they had the option of opting out of the study. This safeguards the respondents while also enhancing the research's credibility. The participants were given consent forms that both the respondent and the researcher had to sign.

1.7. Limitations of the Research

The scope of this research study is limited to industry participants in the Johannesburg region. The headquarters of all the major record labels can be found here or at least a major affiliate can be found in Johannesburg. From the viewpoint of the major labels, this city has been deemed reflective in drawing broad conclusions about the music industry. It is possible that the participants' list did not include all the industry's skills and experiences. Furthermore, to cover a diverse mix of participants, the study's reach is limited to stakeholders from major and independent labels, as well as music entrepreneurs.

1.8. Outline of Chapters

The first chapter's goal is to provide a background analysis for the rest of the research's material. There will be six chapters in this paper. The following is a summary of the details found in each chapter:

Chapter 1: The introduction to the study is provided in this chapter. With the aim of providing the reader with a broader picture of the problem statement and the intent of the research. The study's research questions, and the study's objectives are all found in the first chapter. This chapter also includes a summary of the research methodology followed in the study.

Chapter 2: This chapter details the conventional music industry supply chain and describes how technology has changed the structure of supply chain activities. This chapter

also includes research on the existing players in the South African recording industry, as well as literature on the Fourth Industrial Revolution.

Chapter 3: In the third chapter, the study's research methodology is described in detail. This chapter describes the research's properties as well as the measures taken during the research's execution.

Chapter 4: This chapter delves into the data gathered during the study, as well as the critical factors to consider when assessing the current and potential condition of the South African music industry's supply chain.

Chapter 5: In the fifth chapter, the findings are discussed in contrast to the literature reviewed in the study. Additionally, the information collected from the participants to develop arguments for the current and future state of the music industry’s supply chain are contained in this chapter.

Chapter 6: The sixth chapter highlights the major findings that were drawn from the study. As a result, the final chapter will include the conclusions of the study, as well as recommendations derived from the research and conclusions.

CHAPTER 2. LITERATURE REVIEW

In this chapter, the focus will initially be on understanding the traditional music industry supply chain, significant technological advancements within the music industry and the advent of the Fourth Industrial Revolution. The chapter will begin with the method used to collect the relevant literature for the study. The chapter proceeds with an analysis of how the traditional music industry and its supply chain are changing in the context of the technological advances. The formulation of the conceptual framework will also be done in this chapter. The literature review will thus be used to establish and understand the structure of the traditional model of the music industry as well as the different innovations that have affected the industry in the past. Finally, a descriptive analysis of the literature reviewed will be presented.

2.1. Systematic Literature Analysis Method

Data was collected from the literature and previous work of other scholars on the topics of music, technological advancements in the music industry, Industry 4.0, and supply chain management.

Secondary data includes textbooks, journals, reports from public institutions or phonographic societies, and the Internet (see Chapter 3.1.1 of this study). Cooper *et al*. (2014) point out that discovering what has already been achieved by the compilation of primary data is inefficient, and that previous studies might also have a wealth of historical data.

The data collected is based on supply chain management, music, Industry 4.0, and music related technological innovations. The aim was to review the relevant literature to the research question thoroughly, and some high-quality papers were omitted if they did not help address the research question. The research material was found in databases such as ScienceDirect, JSTOR, ResearchGate, IEEE Xplore, ProQuest, Scribd, and papers written by organisations' research centres. The search terms "music supply chain" and "fourth industrial revolution and music" were used in the databases listed.

The initial searches through the databases generated a large set of results, which included magazines, academic journals, trade publications, books and eBooks, news, internet articles, electronic resources, and conference materials. Cooper *et al*. (2014), suggest a source evaluation criterion for sources obtained from the Internet, which was employed by the researcher to filter the results obtained from the initial database searches. Cooper *et al*.

(2014), propose that researchers should analyse and choose information sources based on the following five factors that can be applied to any type of source, whether printed or electronic. These are:

- Purpose —the explicit or hidden agenda of the information source.
- Scope — the breadth and depth of subject coverage, as well as the time span, regional restrictions, and information inclusion requirements.
- Authority — the level of data (primary, secondary, and tertiary) as well as the qualifications of the source author are all factors to consider(s).
- Audience — the characteristics and history of the individuals or groups for which the source was produced.
- Format — the setup of the information and the ease of which detailed information can be found within the source.

After that, the papers' names, abstracts, keywords, and journal details were imported into Microsoft Excel for further review. The abstracts and titles of the papers were carefully read to find the most important articles to the research issue. The literature identified comprises of 36 sources in the form of articles, journals, thesis papers, industry reports, and books (see Table 2.1).

Table 2.1. Types of articles cited in the document analysis.

Type of source	Freq.
Journal Paper	15
Book	9
Industry Report	9
Thesis Paper	3

Some of the sources were excluded from this analysis, especially internet sources such as blogs, internet reviews, etc. Although these sources were considered relevant to the study, they did not completely meet the criteria outlined by Cooper *et al*. (2014). A descriptive overview of the relevant data sources can be seen in the following sub-sections.

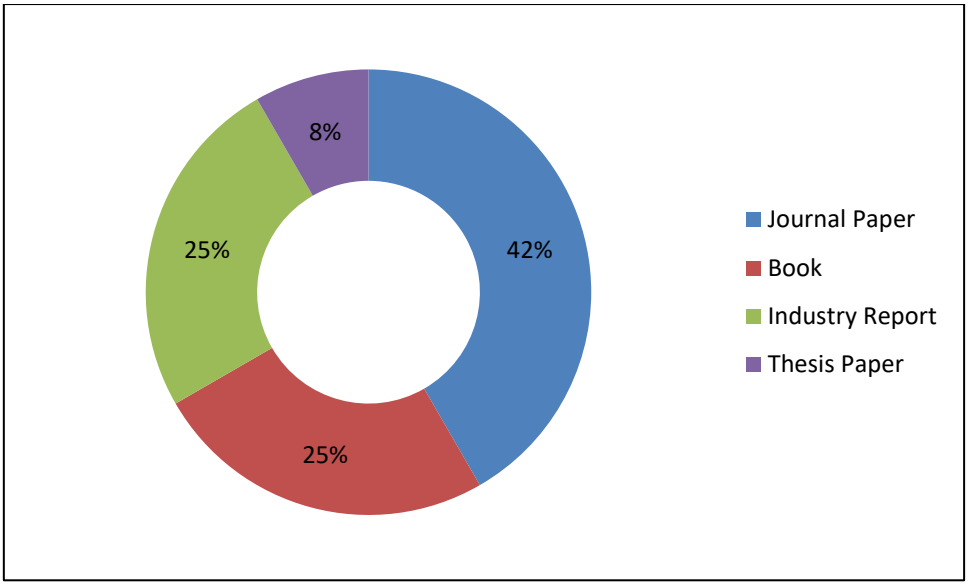


Figure 2.1. Distribution of publication types.

Figure 2.1 shows the distribution of the types of documents analysed in the literature review of this study. With 42% of the relevant documents being journal papers, 25% being books, 25% industry publications and 8% being thesis papers.

The publication years of the articles in the document analysis range between 1985 and 2020 as shown in Figure 2.2. The analysis shows that high number of publications was recorded between 2013, 2017, and 2019. The increase in publications relevant to the research topic depicts an increase in interest from scholars.

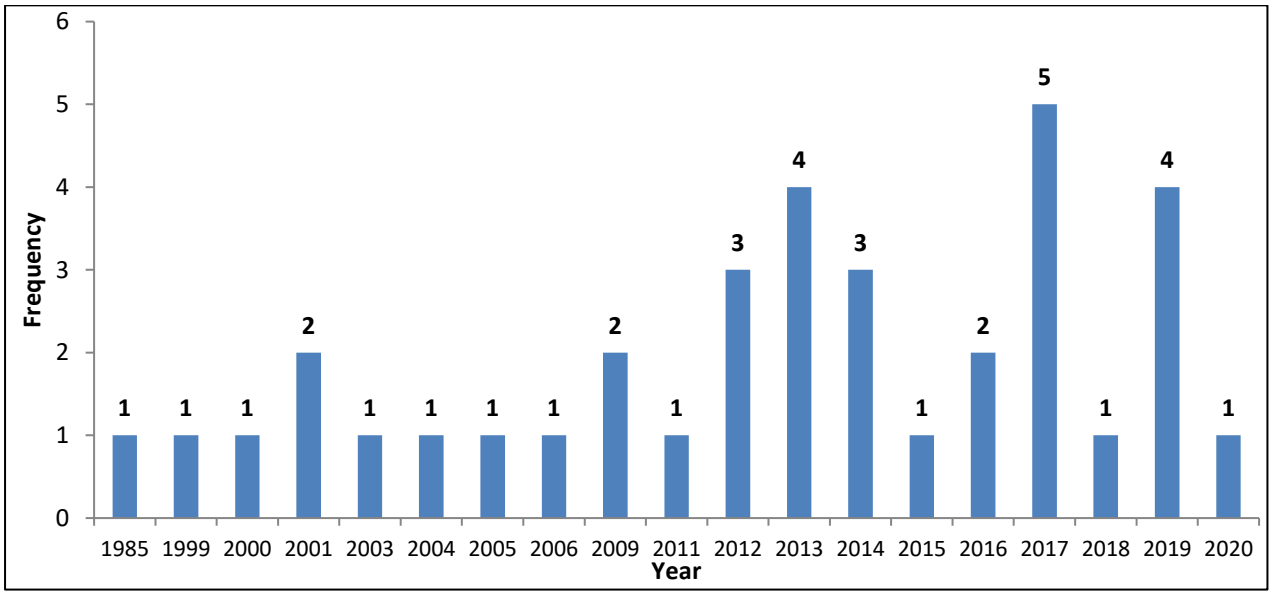


Figure 2.2. Distribution of publication year of cited in the document analysis.

- Types of Journals and Publishers

20 different publishers were used to disseminate the research output from a total of 36 sources including journals, articles, and books (Table 2.2). From the total number of reviewed articles, thesis papers were excluded from the journal outlet count, as these were seen by the researcher as non-published or peer-reviewed papers. According to the findings, International Federation of the Phonographic Industry was most used by the researcher (N = 6, 19.0 %), Harvard Business Review (N = 4, 13%), books by McGraw-Hill/Irwin (N = 3, 10%) Growth and Change (N = 2, 6%), the rest are one paper per each journal outlets.

Table 2.2. Publishing outlets of reviewed articles/journals/books.

Publisher	Freq.	%
International Federation of the Phonographic Industry	6	19%
Harvard Business Review	4	13%
McGraw-Hill/Irwin.	4	13%
Growth and Change	2	6%
Hampshire Cengage Learning	1	3%
Journal of Services Research	1	3%
Africa Media Reports	1	3%
Wiley	1	3%
Currency	1	3%
International Journal of Operations & Production Management	1	3%
Global Value Chain Development Reports	1	3%
Management	1	3%
A&C Black	1	3%
Ada enup cc	1	3%
MIDiA Research	1	3%
OECD Digital Economy Papers	1	3%
European Regional Conference of the International Telecommunications Society	1	3%
International Journal of Music Business Research	1	3%
Institute of Technology Enterprise	1	3%

- Country of research

The analysis highlights the number of publications from 4 countries (Table 2.3). Books, international and continental reports were excluded from the list.

Table 2.3. Publication countries of reviewed articles.

Country	Freq.
USA	12
South Africa	4
Norway	2
Spain	1

The United States contributes the most papers (63%), followed by South Africa (21%), Norway (11%), and Spain (5%). Figure 2.3 shows that the United States is responsible for more than half of the publications. Researchers should investigate whether there is a lack of expertise or interest considering the skewed record number of publications across countries.

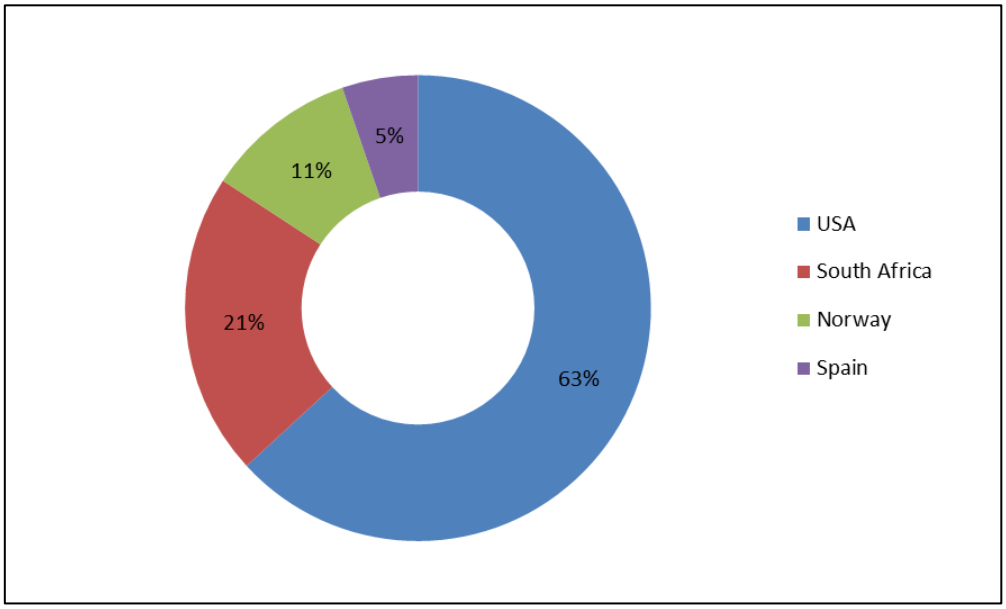


Figure 2.3. Distribution of countries the publications were published.

- Research Methodologies applied in the selected articles

Turning to the research methods employed in each article, as Table 2.4 shows.

Table 2.4. Methods used in the reviewed articles.

Methods	Freq.
Mixed-Method	6
Case Study (Qualitative)	4
Conceptual Analysis	4
Survey	3
Mathematical Modelling	1

As can be seen in Figure 2.4, most of the studies considered for review used Mixed-Methods (n = 6, 33%) i.e., combination of two or more research methods, case study type research-method and conceptual analysis (n = 4, 22%), followed by survey type research methods (n = 3, 35.0%).

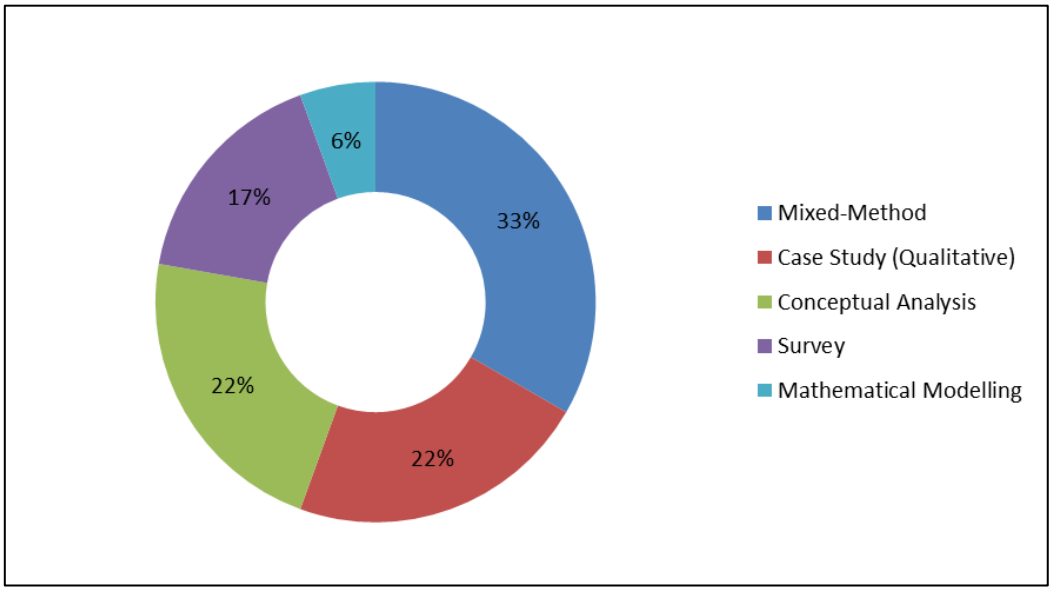


Figure 2.4. Distribution of the research methods employed in the publications.

2.2. The Music Industry Supply Chain

Porter (1985) described a supply chain as a collection of interconnected suppliers and customers, referred to as links, actors, or players. In a supply chain, organisations form a network where upstream suppliers provide input, which the business then adds value to

before moving it downstream to the next player, which may be another company or the end consumer (Porter, 1985). Stevenson (2012) simplifies this further by defining a supply chain as the internal and external sequence of entities involved in the creation and distribution of a product or service. Effective supply chain management is important because many enterprises today gain a major competitive advantage by planning and controlling their supply chain operations (Jacobs *et al*., 2009).

Music, in all its forms, has become a product that can be sold and consumed, a way of generating money, so examining music as an industry from a business perspective makes sense (Ricardo, 2017). Porter (1985) was the first to introduce the value chain concept by considering an entity as a system consisting of subsystems, each with inputs, processes of transformation and outputs, all of which seek to add value to the provided product or service. Competitive advantage is the fundamental economic theory at the heart of value chain analysis, which includes defining all the various stages of production and deciding which steps in the chain can be removed or enhanced (Thompson *et al*., 2014).

According to Hardaker *et al*. (2001), the design of supply chains involves four interrelated dimensions:

- the structure of activities
- the choice of players
- the governance mechanism; and
- the co-ordination structure.

In this study, these four supply chain dimensions and the definition of the value chain have been used to try to explain the essence of the supply chain in the music industry and will later be used to outline the developments in the supply chain. The four dimensions will each be briefly described before being used to analyse the traditional music supply chain and then to show how technical innovations have influenced the supply chain.

2.2.1. The structure of activities

As in the manufacturing process, the series of processes involved in getting the product from the suppliers of raw materials to the distribution of the final product to the customer, determines the supply chain structure (Hardaker *et al*., 2001). Waltman (2011) observes that, when it comes to cultural products such as music, this chain begins with an initial creative concept, which is then combined with other inputs to produce a cultural good or service. This

includes a series of different players and activities that take the form of business units within a sector, within a corporation, or a company. In the case of the music industry, to reach a customer, music must be developed, generated, processed, replicated, and distributed, thereby constituting the value chain, as can be seen in Figure 2.5.

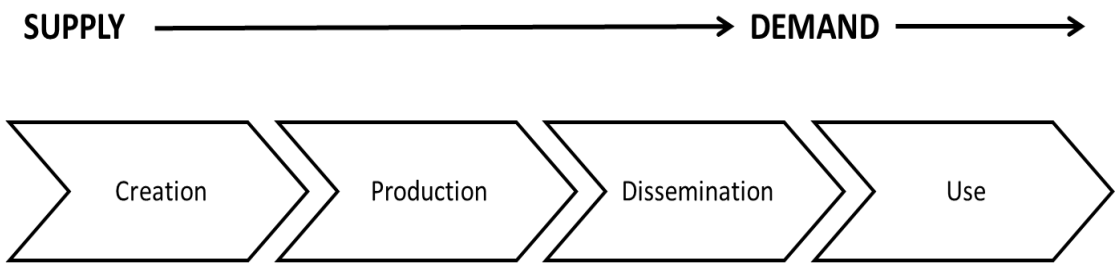


Figure 2.5. Basic Value Chain for cultural goods (Waltman, 2011)

While conceived as a method for evaluating specific firms, the concept of the value chain can also be extended to the analysis of entire industries. In fact, Porter (1985) emphasised the significance of connections between the company, its suppliers and consumers which gives rise to the analysis of the industry value chain, called the Value System. Thompson *et al.* (2014), further notes that operations are serially interdependent in many sectors, which means that if the previous one has not been successfully performed, a subsequent one in the chain will not occur. Nevertheless, Graham *et al.* (2004, p.1091), observes that, "… rather than being created through a process of rational planning, the structure of a supply chain emerges over time and is influenced by factors such as chance, habit and communication and co-ordination constraints."

To further expand on the value chain defined by Waltman (2011) in Figure 2.5, Graham *et al.* (2004), outlines a traditional music value chain, which can be seen in Figure 2.6, that shows the product as the end point to a series of value adding activities, which include:

- **Content creation (including publishing):** Which is includes discovering new artists, signing artists, overseeing production, and creating artist images and signing them into long-term exclusive contracts (which is usually referred to the Artist & Repertoire (A&R) process) (Parikh, 1999).
- **Production (recording):** The recording and production of music in a studio, music selection and creation of master tapes.

- **Manufacturing:** Packaging of the product into CDs, vinyl, etc. Some companies have their own factories to produce from, while others outsource manufacturing.
- **Sales and marketing:** Promotion though media channels like newspapers, radio, and TV stations. Since customers seldom buy music, they have not heard before, airtime on the radio and other forms of publicity for a specific artist or band are critical. (Parikh, 1999).
- **Distribution and Wholesale:** These companies usually function as large retailers.
- **Retailers:** When the music is needed, retailers purchase it from wholesalers.
- **Customers:** Customers purchase a product in a physical retail store**.**

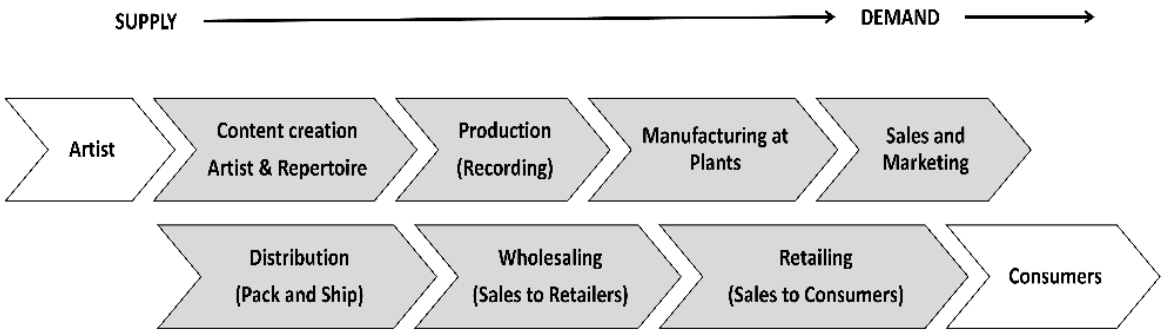


Figure 2.6. A traditional music industry value chain (Graham *et al*., 2004)

2.2.2. The choice of players

This dimension is linked to the degree of dynamism in a supply chain's selection of players (Hardaker *et al.*, 2001). Hardaker (2001) further explains that the chain is very static when stakeholders in a chain are well well-known. Alternatively, the chain is very fluid if the participants in the chain change from one business opportunity to another. In between, there are variable degrees of flexibility in the choice of supply chain partners that are involved in the production and distribution of music. When all players belong to the same organisation, a supply chain is vertically integrated. Vertically integrated chains typically show a high degree of rigidity, since businesses can only select from companies they own or are willing to buy (Graham *et al.*, 2004).

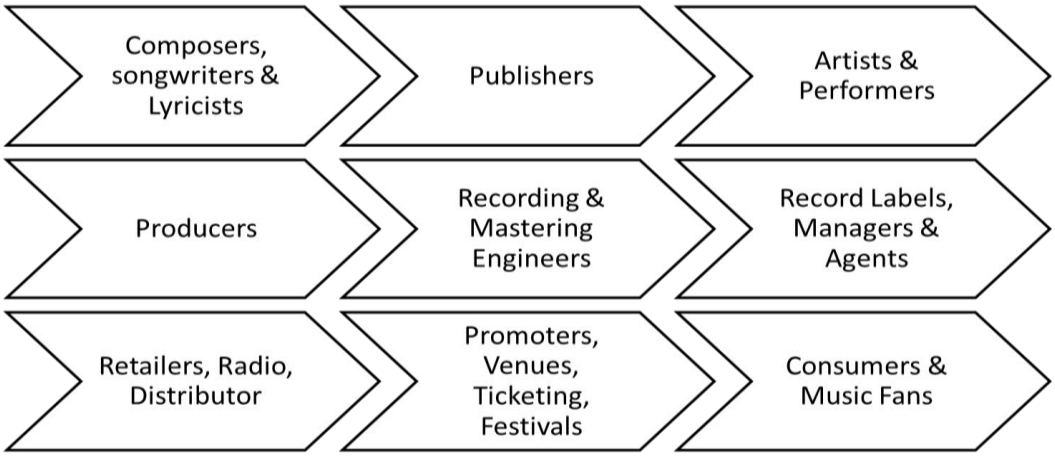


Figure 2.7. Players in the value chain of the "traditional" music industry (Ricardo, 2017)

Figure 2.7 shows the stakeholders in the music value chain. However, according to Ricardo (2017), this picture is limited because it only depicts the system's core stakeholders. The supply chain for the music industry has historically been inflexible and fixed. Players were well-known, and the number of players available in the music supply chain was small (Hardaker *et al.*, 2001). Evidently, the conventional supply model in the music industry has remained largely unchanged since the advent of commercial recording and distribution over a century ago (Ricardo, 2017).

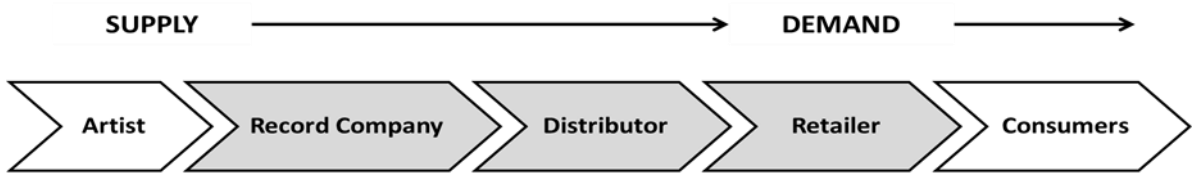


Figure 2.8. Traditional Music Industry Players (Graham *et al*., 2004)

As shown in Figure 2.8 above, there are usually three levels of intermediaries between the music producer and the consumer of music: the record label, the distributor, and the retailer (Graham *et al.*, 2004). As the product flows through the supply chain, each player between the artist and the customer adds costs and takes profits, leading to a higher final product price. Through their creativity, composition and arrangement of music, the artist generates initial value. The record companies then use the capital as well as marketing expertise to sell and distribute the music on a large scale. Record labels also have the expertise to deliver excellent sound quality and packaging (Hardaker *et al*., 2001). The labels are best able to market the music the artists have produced through their partnerships with newspapers, radio stations, music TV channels and retail stores (Parikh, 1999). Furthermore, through coordinating

composers and musicians, they add value to the product, provide artistic feedback through producers and A&R managers, and organise the recording of the songs, as well as organising production, marketing, and distribution activities (Parikh, 1999). Major investments in distribution networks have also been made by the big record companies. They are also big distributors of physical music goods to retailers that provide consumers with music (Graham *et al*., 2004).

2.2.3. The governing mechanism

The governance dimension is concerned with the ownership and control of various supply chain players (Hardaker *et al*., 2001). In a vertically-integrated supply chain, the dominant force is usually the company that links the other companies to produce the final product (Tapscott *et al*., 2000). The company would also have leverage over the chain's main resources and value measures. Otherwise, in the absence of vertical integration, each company can operate independently of others, with only a limited relationship with them. According to Hardaker *et al*. (2001), the supply chain's regulating structure is calculated by matching the costs of doing business with customers and suppliers with the costs of manufacturing products in the supply chain. If transaction costs are high, businesses may find it more lucrative to own suppliers and distributors, and supply chains may become vertically integrated as a result (Hardaker *et al*., 2001). If transaction costs are low, however, businesses will find it more lucrative to outsource operations and focus on core competencies like artist production and promotion rather than activities like distribution (Tapscott *et al*., 2000).

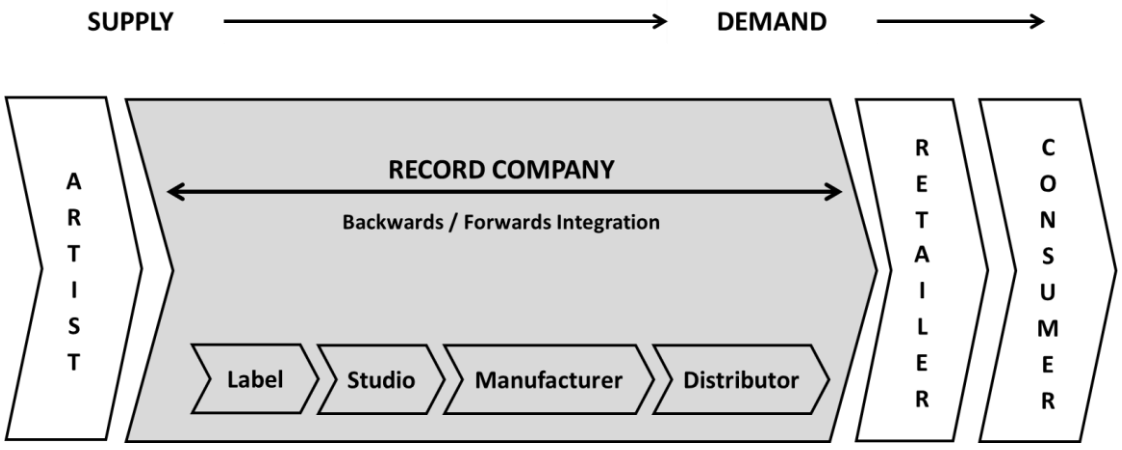


Figure 2.9. Traditional Music Industry governance (Graham *et al*., 2004)

According to Graham *et al.* (2004), high market entry costs and a scarcity in the number of distribution channels have been characteristic of the music industry. These high costs are

linked to the need for a strong market position to justify the initial operating expenses in A&R, recording, and manufacturing, as well as marketing. The major record labels, which are discussed in greater detail later in this chapter, have traditionally dominated the music industry.

Vertical integration and growth-through-acquisition strategies (see Figure 2.9) have created the governing position of the major record companies. Through the supply chain, these companies have purchased forwards and backwards (e.g., new brands, production, and distribution companies), or established their own stables of producers and A&R executives (Graham *et al.*, 2004). Not only do record companies manage other connections in the supply chain by integrating vertically, but they also gain economies of scale and are able to lower unit costs (Wikström, 2014). In addition, every time they sign a new artist, they do not need to negotiate a production or distribution agreement, thereby avoiding high contract costs. The high costs of setting up a distribution infrastructure, as well as the major record labels' control over distribution channels, have created significant barriers to entry. Artists who were not signed to a record label had almost no chance of competing against established record labels in this situation. As a result, artists had to choose between remaining independent and concentrating on small, niche markets, or signing long-term deals with major labels to break into mass markets. (Graham *et al.*, 2004).

2.2.4. The co-ordination structure

The flow of knowledge, according to Bowersox *et al*. (2013), is one of the most critical processes for supply chain co-ordination. Co-ordination takes place when orders for services and goods are communicated, stock levels are recorded, and demand for specific products and services is expressed (Hardaker *et al.*, 2001). Orders are the most significant type of information, as these trigger action. Nevertheless, according to Bowersox *et al*. (2013), information transferred in the form of "orders" gives the supply chain an inaccurate and skewed image of demand, causing the "bullwhip" effect. The term bullwhip effect refers to the magnification of demand fluctuations as orders move up the supply chain (Jacobs *et al*., 2009). As a result, small demand fluctuations further down the supply chain may be misinterpreted, resulting in massive and costly output fluctuations higher up. Hardaker *et al*. (2001) suggest that if alternative, network-based communication, and collaboration routes in a supply chain were planned and implemented, this effect could be avoided.

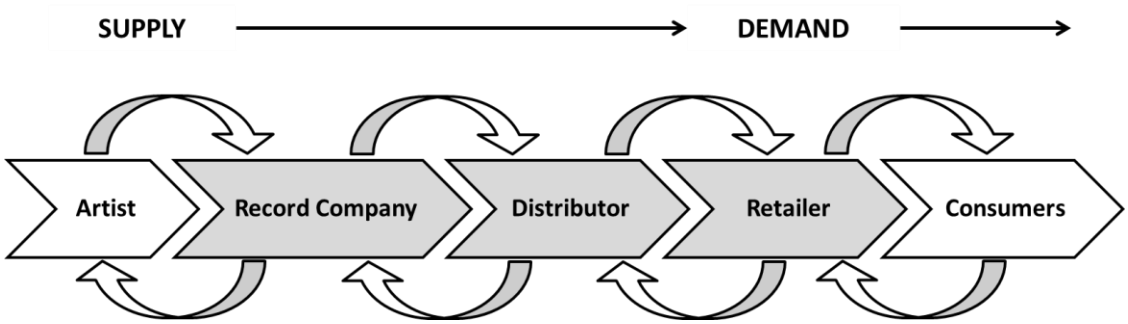


Figure 2.10. Traditional Music Industry co-ordination (Graham *et al*., 2004)

Traditionally, co-ordination in the music supply chain takes place in a hierarchical system and is largely between two groups (see Figure 2.10), as shown by the communication of goods orders between record labels, producers, and retailers. Hardaker *et al.* (2001), use electronic data interchange (EDI) as an example of an inter-organisational information and communication system. With EDI, two companies can communicate and exchange data between their organisations more easily and at a lower cost than with a paper-based system. Furthermore, scanning systems for point of sale (POS), introduced in the 1990s, allow record store inventory to be more accurately monitored. In the conventional music supply chain, these technical advancements reduced the "bullwhip" effect and improved performance. Despite this, conventional dyadic relationships are still in use, EDI and POS are not commonly used, and supply chain distortions are often removed even where the technology is used (Hardaker *et al*., 2001).

2.3. Technology Changes in the Music Industry Supply Chain

Digitalisation is frequently portrayed as a threat to the music industry's survival. This is not the first time this has been said about a music industry disruptor. For instance, the record industry echoed the same sentiment in response to the widespread diffusion of cassette replication as normal in-home stereo systems in the 1970s and 1980s, stating that home taping is destroying music (Rogers, 2013). When it first debuted in the 1930s, broadcast radio was seen as a major threat to the recording industry, it was claimed that people would not buy records if they could listen to music for free on the radio (Rogers, 2013). The advancement of digital technologies and distribution networks in recent decades has led some analysts to believe that artists and consumers will have a much more direct interaction in the future, making a plethora of conventional intermediaries redundant while undermining the dominance of major companies in the industry (Graham *et al.*, 2004).

Technological advancement in many sectors is now the most significant engine of competitive performance. Products produced in the last five years account for nearly one-third (or more) of all revenue and profits in a variety of industries (Schilling, 2017). Schilling (2017) uses these two businesses as examples: products produced within the last five years at Johnson & Johnson have accounted for over 30% of the company's revenues, and sales from products developed within the last five years at 3M have reached as much as 45% in recent years. In the music industry, the landscape has also changed dramatically over the last decade.

2.3.1. The Internet and the Mp3

Christensson (2015) defines the Internet as a global wide area network that connects computer systems across the world. The Internet fundamentally changed the supply of music in many ways (Graham *et al*, 2003). The Internet is a common medium for the exchange of personal data (e-mails) and more organised documents (attachments). It makes it easier for organisations to share information and is an effective tool for the distribution of information. Also, in such a turbulent and unpredictable climate, such as the music industry, the advent of the Internet established a chain of events that were incomparable (Graham *et al*, 2003).

In 1991, an algorithm was developed by Fraunhofer IIS, a research institution in Germany, to set in motion a revolution in how music was distributed, processed, and consumed. The algorithm allowed digital audio to be compressed into a file small enough to be stored on a hard drive. This format, referred to as the MP3, changed the manipulation of music; an album was now a file that could be stored on a hard drive and a file was tiny enough to be transmitted over the Internet (Schilling, 2017).

For consumers, compressed MP3 files had several advantages. MP3s allowed music to be transmitted at a quicker and more viable rate between individuals and computers (Bielas, 2013). This made it fast and simple for customers to stream music digitally, as an album can be downloaded in minutes or even seconds, without the quality loss that would occur in all previous file formats. MP3 files could also be copied an infinite number of times without the loss of quality, as is the case with public good that do not decrease in supply as more people consume them, a free-rider problem began to emerge with the adoption of MP3 technology (Bielas, 2013). Consumers could download a song for free and not take it away from someone else in the world. When users came to understand that their consumption of music

would not harm anybody else, MP3 technology made free music streaming possible and acceptable (Bielas, 2013).

Another benefit of MP3s is that they are an open format, which means that almost anyone can obtain an encoder and create their own MP3s (Bielas, 2013). Bielas (2013) further illustrates this point by comparing the invention of the MP3 as being like that of the printing press. The Guttenberg Bible, made possible by the printing press, allowed every individual to own a common language bible. Only the Catholic Church had a copy of the bible prior to the printing press, and it was in Latin. As the Guttenberg Bible soon became available to everyone, ownership over the bible and faith moved from the Catholic Church to the individual. For MP3s and the music industry, the same was the case. Only record labels could own and manage the material that was recorded on a CD prior to this technology. With the launch of MP3s, customers could now own and control a copy of any music they wanted (Bielas, 2013).

Since the invention on the MP3, the importance of music in physical formats has dramatically decreased, while the importance of Internet media has exploded, creating a high degree of accessibility, and loosening intellectual property regulation (Wikström, 2013).

Parikh (1999) illustrated the music industry supply chain prior to the introduction of the Internet and digital distribution, as can be seen in Figure 2.11, to consist of three functions: the creation of music, marketing of music and the distribution of music, as similarly highlighted by Graham *et al.* (2004) in Chapter 2.2.2 of this report.

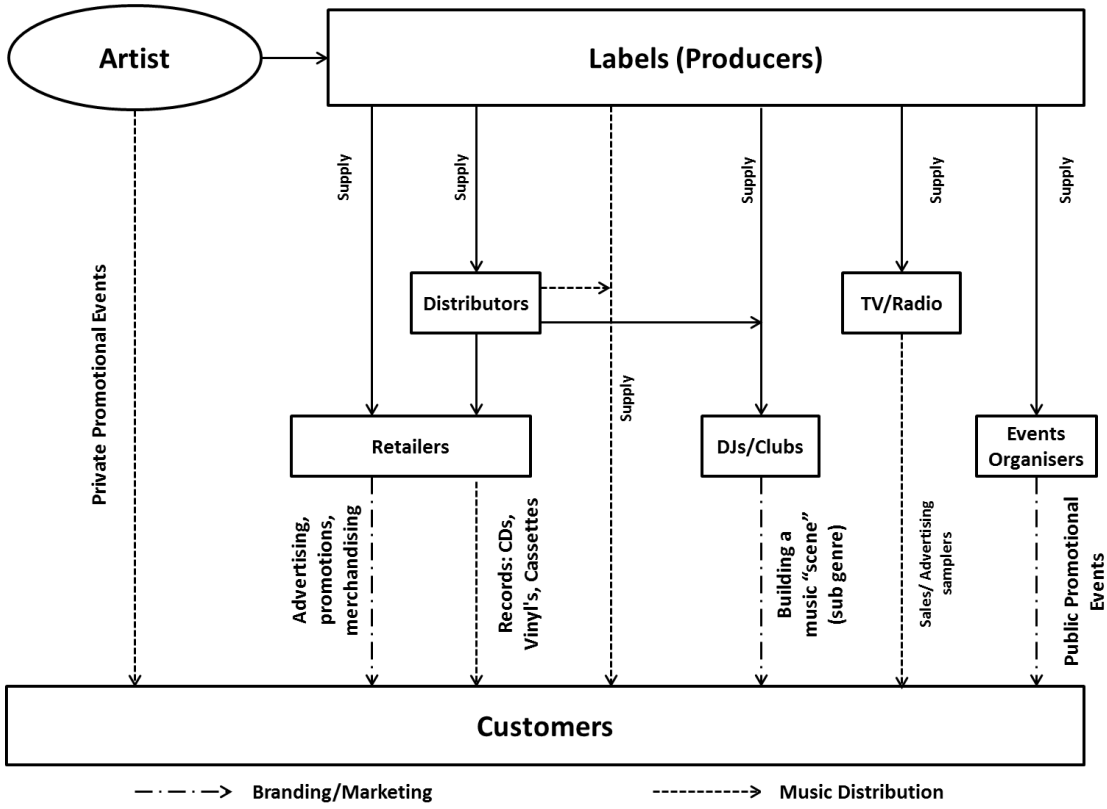


Figure 2.11. Traditional music structure (Parikh, 1999)

In Figure 2.11, the dominant force within the music industry supply chain structure is the record label. The labels govern the main marketing and distribution networks and thus control a lot of influence in the supply chain of the industry (Graham *et al.*, 2003). In the traditional structure, artists do not compete individually because they have restricted access to marketing and distribution networks, according to Parikh (1999). The control of power the labels have means that, from their music sales, labels receive approximately 85% - 90% of the profit (Parikh, 1999).

Figure 2.11 illustrates an industry structure that was relatively inefficient because it incorporated levels of intermediaries between the artist and consumers. It would therefore be expected that less intermediaries between the seller and the customer would contribute to a mark-up reduction (Parikh, 1999). Parikh (1999) indicated that it would be technically possible to go directly to the customer with minimal mark-up on the consumer's cost by eliminating intermediaries inside the distribution channel. Simultaneous and interrelated technological developments, like the Internet and MP3, have characterised the supply chain for music in recent, which have fundamentally altered the supply of music from artist to customer (Bielas, 2013).

2.3.2. Music piracy and Peer-to-Peer networks

Anyone in the music industry is aware of the concept of music piracy; it affects everyone from the songwriter to the producer. Music piracy is the duplication and dissemination of recordings of a piece of music (CDs, DVDs, etc.) for which the copyright holders (composer, recording artist, or copyright owning record company) have not given permission (Bielas, 2013). Bielas (2013) identifies six different types of piracy in the music industry:

1. Piracy – the commercial copying of official releases' audio only (without the cover artwork).
2. Tape trading entails the sale of cassettes and CDs containing bootleg recordings.
3. Bootlegging – commercial recording, reproduction, and sale of music that has never been officially issued by record labels (e.g., live concert)
4. Counterfeiting – the copying of legitimately published records, including the cover art, for commercial gain.
5. CD burning – the non-commercial copying of legally available music onto a CD by a person.
6. File sharing – music that has been made available for download by a third party (both officially licensed and bootleg).

As the music industry's technology progressed to a level that enabled customers to access music for free, Internet piracy and file sharing became the music industry's biggest challenge (Bielas, 2013). The record labels were struggling to remain competitive while buyers and artists benefited from these newer innovations. Record labels have acknowledged piracy as the main cause of their loss of sales since 1999 (Bielas, 2013).

The IFPI reported in 2008 that 95% of all online music traffic was related to illegal file sharing and distribution (IFPI, 2009). That led them to forecast a loss of EUR 240 billion in the 2008-2015 period for European Creative Industries, with a simultaneous loss of 1.2 million jobs in these sectors (Rogers, 2013).

Local Area Network (LAN) file-sharing, digital stream ripping, and mobile music piracy are the three major types of Internet piracy currently in use.

- **Local Area Network (LAN) File Sharing**

LAN file sharing enables users to connect to a local network, such as a university, which allows users to share files easily.

- **Digital Stream Ripping**

Digital stream ripping uses music streamed from a website and transforms it into permanent files that can be saved, exchanged, and collected on your computer by the user.

- **Mobile Music Piracy**

This involves getting free music on a mobile phone and using the Bluetooth and Wi-Fi capabilities of the phone to move the content to other phones at no cost.

According to OECD (2005), piracy is an important obstacle to the development and reinforcement of legal services for the online distribution of copyrighted content and the preservation of an environment conducive to the production of original materials. The challenge for business is to find ways of managing digital piracy while creating new digital distribution revenues. The interest of music companies tends to be increasingly shared by numerous players in the value chain, including network operators and Internet Service Providers seeking revenue from digital music distribution (OECD, 2005).

Copyright owners have suffered infringement of their rights by the unlicensed distribution of their works and unauthorised file-sharing poses a great threat. The OECD (2005) advises that regulatory mechanisms should be established to balance the needs of suppliers and consumers in areas such as the security of intellectual property rights and the management of digital rights, without weakening creative business models and without preventing the legitimate use of underlying technologies. The OECD (2005) notes that it is necessary to find ways to leverage the technical potential of technologies such that incentives are preserved and strengthened for the production and distribution of original works such as music.

2.3.2.1. Peer-to-Peer File Sharing

Peer-to-peer technologies are a type of communication in which people communicate directly with one another rather than through a centralised system. Users can share data, participate in collaborative projects, make files available, and move files. (OECD, 2005).

Shawn Fanning, a Northeastern University student in Boston, created Napster in 1999, a software program that made it simple for Internet users to share MP3 files (Wikström, 2014). Napster allowed users to download and distribute music without paying royalties to the

owners of the copyright (Wikström, 2014). Consumers were given the wonderful gift of having access to all the world's music in one place, at no cost and with only a mouse click, thanks to Napster. It fundamentally altered the relationship between music and its listeners (Mulligan, 2015).

Because consumers could access a large catalogue of MP3 files, Napster had become one of the world's most popular P2P file-sharing services by 2001. (Rogers, 2013). From 2002 to 2003, the keyword "MP3" was the most searched on Internet search engines, according to (Kwong and Park, 2008, as cited in Dos Santos, 2016). With the renegade pioneer Napster, followed by others such as Kazaa, digital music distribution through unauthorised consumer peer-to-peer (P2P) file sharing became one of the most common Internet activities around the world (Mulligan, 2015). The music industry soon sued Napster, and the company was finally forced to shut down the operation. However, this was quickly followed by a slew of other, more advanced offerings (Wikström, 2014).

As P2P networks became more popular, elements of a digital music value chain emerged comprising the following:

- file sharing software
- jukebox software
- portable MP3 players
- Internet connectivity and personal computers creating a community of users providing content.

According to Graham *et al*. (2004), the implications of file-sharing on the traditional value chain were:

- The physical distribution chain became less and less important.
- As other players found it easier to enter the market, the major record companies' monopoly on the music industry weakened.
- The rise of Internet-based music piracy has weakened the record industry's position (as well as other music industry participants)

The music industry noticed two things because of these illegal peer-to-peer networks. To begin with, the consumer preferred to download digital music and appreciated having it in a

portable format. Second, as technology advances, the Internet's role in the music industry will only grow (OECD, 2005).

2.3.3. The Digital Music Industry

In the music industry, the Internet not only connects artists with fans, but it also enables artists to circumvent the conventional recording path, which is reliant on record labels. Physical product delivery and retail are no longer necessary thanks to the Internet. It also makes it easier for customers and those involved in manufacturing and distribution to communicate. As a result, new niche companies will emerge to challenge the dominance of the major record labels (Graham *et al*., 2004).

There have also been other big influences on the music industry that the Internet has had. Thanks to newer technologies, more musicians can enter the music business than ever before. The new distribution platforms made possible by the Internet have eliminated the entry barriers to the music industry and made it possible to sell music digitally to anyone with a computer. In the music industry, new players are outpacing the capacity of conventional labels to find new artists (Bielas, 2013).

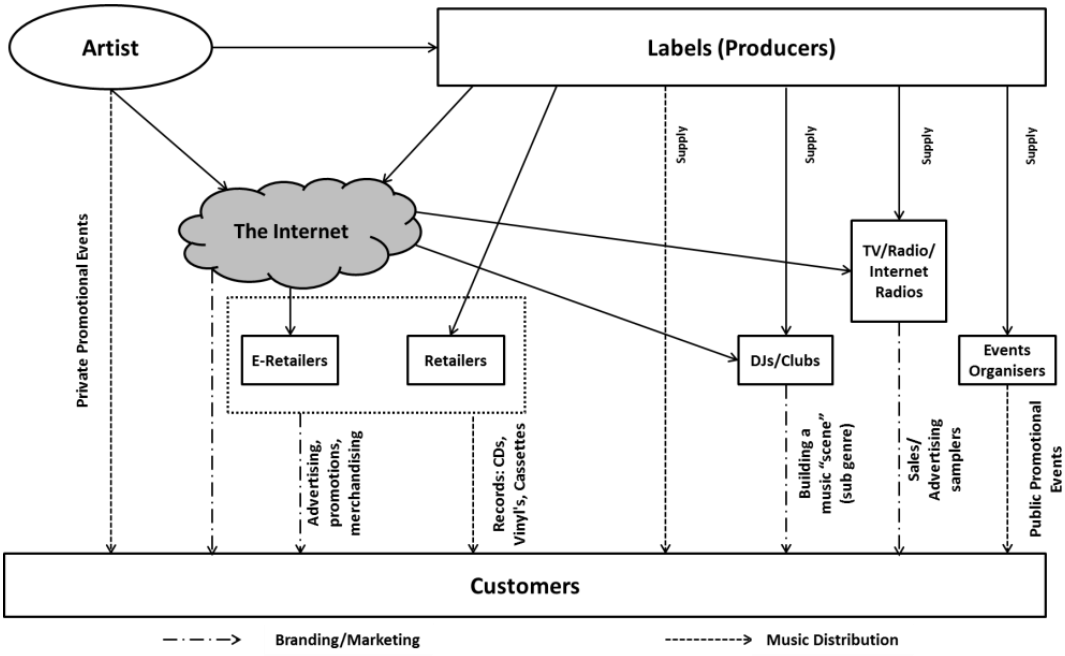


Figure 2.12. Post Internet music structure (Parikh, 1999)

Digital marketplaces have emerged because of the advancement of the Internet. As shown in Figure 2.12, a digital platform has been created to allow consumers to purchase their music through the Internet rather than purchasing a physical copy from a physical retail store. Since

the turn of the century, the digital marketplace has become the fastest rising form of acquiring music (Bielas, 2013).

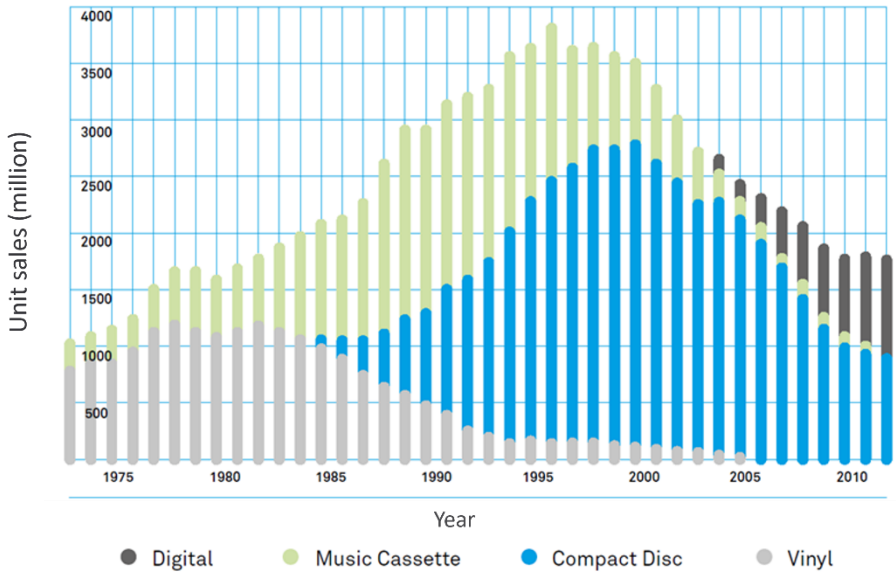


Figure 2.13. Recorded Music Sales 1973-2012 (IFP, 2013).

Note: Digital includes full-length albums and singles split by 4. Vinyl includes LPs and EPs split by 4. Music DVDs are not included.

Figure 2.13 depicts how the global recorded music industry has changed since 1973, demonstrating that while the digital music market has been able to somewhat offset the decline in physical sales, the overall recorded music market has lost more than 50% of its sales since the 1999 peak (IFPI, 2013).

In 2019, global reported music sales amounted to US$20.2 billion, a rise of 8.2% over 2018 and the fifth consecutive year of growth, powered by growth in paid subscription streaming, as can be seen in Figure 2.14 (IFPI, 2020).

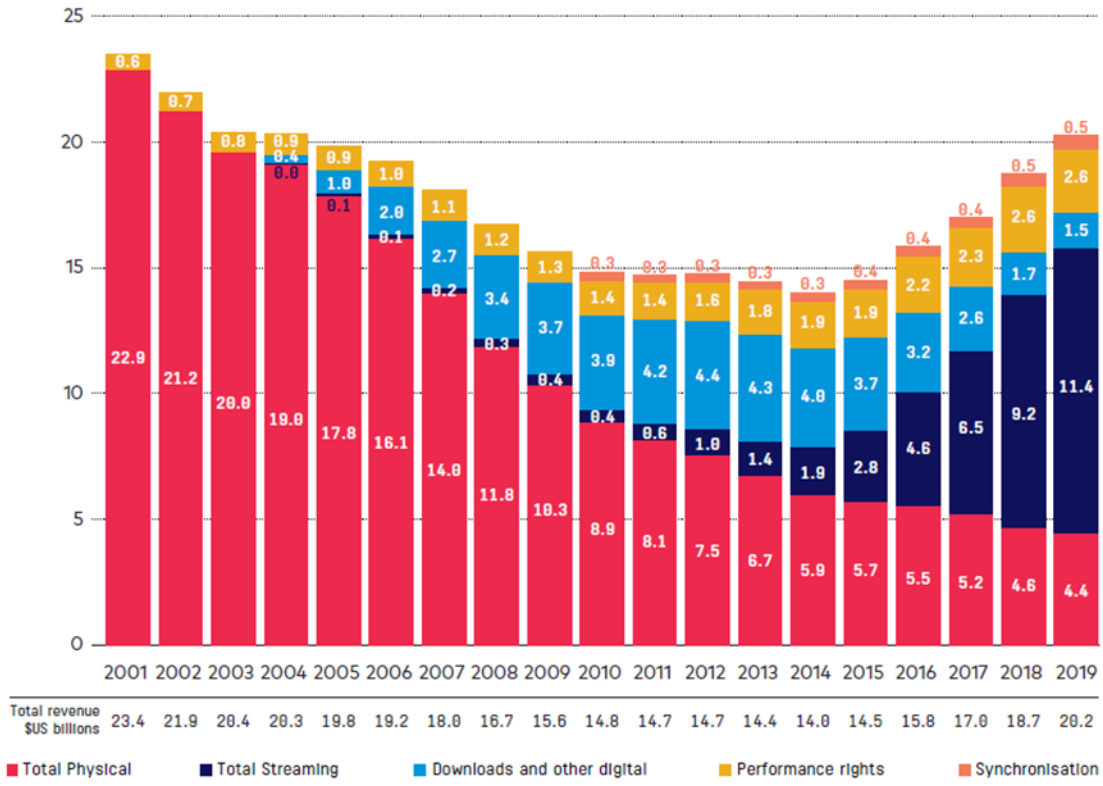


Figure 2.14. Global Recorded Music Industry Revenues 2001-2019 (US$ Billions) (IFPI, 2020)

It can be seen from Figure 2.14 that the global dominant revenue format, streaming revenue, climbed by 22.9% in 2019 to US$11.4 billion. Streaming accounted for 56.1% of the overall industry, making up more than half of global recorded music sales for the first time in 2019. In 2019, digital sales saw a decrease of 15.3%, largely driven by a sharp fall in download revenues across various markets, a format that now accounts for just 5.9% of the overall market. While physical sales continued to decline globally in 2019, 5.3% decline year on year, and now account for about a fifth of the total market (21.6%), they declined at a lower rate than the previous year, 10.3% (IFPI, 2020).

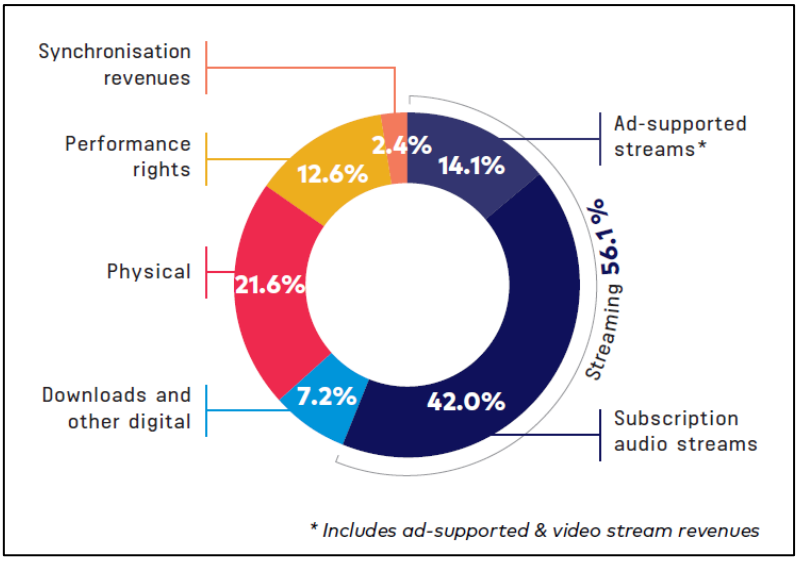


Figure 2.15. Global recorded music revenues by segment 2019 (IFPI, 2020)

2.3.4. E-Retailers

In the 1990s, several e-retailers emerged to sell CDs and audio cassettes over the Internet, such as BuyMusic.com and Amazon.com (Parikh, 1999). A variety of physical retailers, such as Tower Records and Virgin, were also inspired to go online by their success. Furthermore, Internet radios, such as Rolling Stone Radio and NetRadio, also emerged as a new form of data disseminator (Parikh, 1999).

Internet-radios use audio streaming software to send music from a website. Streaming audio technologies allow listeners to listen to music, but they are restricted from storing the music on the hard disk of the device (Parikh, 1999). Since transmitting music files requires less bandwidth, it became popular even though the quality of streaming audio is significantly lower than that of CDs. If consumers wanted to buy CDs or audio cassettes of their favourite artists, most Internet-radios even guided listeners to e-retailers. The business model of these Internet radios consists of the advertising on their websites and the sales commissions directed to the e-retailers affiliated to them (Parikh, 1999).

The introduction of the Internet reduced transaction costs by bringing efficiencies in many aspects of music retailing (Parikh, 1999):

- E-retailers do not need a physical store. This reduces the expense of recruiting sales personnel, building and retaining physical outlets, and shrinkage.
- There is no need for e-retailers to hold inventory. E-retailers simply play the role of info-media, with proper integration of front-end and back-end systems. They

will have the physical items (CDs and Vinyl) shipped directly to the customers' doorsteps from the distributors' or the manufacturers' warehouses. This not only lowers inventory costs, but also offers versatility that reduces the risk of changes in the taste of the customer.

- Online use reduces the expense of searching for both buyers and sellers. A customer can scan for their favourite artist's music from a database of millions of CDs with just a few mouse clicks. To find a cheaper price, the customer may also jump from one e-retailer to another. Before purchasing the CD, they can preview the music using streaming audio technology. And all of these can be achieved in home or workplace comforts without the hassles of going to a physical store and waiting in the queues. Sellers, on the other hand, can also easily monitor each buyer's music preferences and provide personalised data and better service.
- Instant access to the global market is provided by the global reach of the Internet. Music stores had to spend millions of dollars on opening and setting up logistics for a store in another city prior to the Internet. E-retailers can now negotiate with consumers anywhere in the world and have courier companied deliver the merchandise.

2.3.5. Streaming Music Services

Another major turning point for the industry was the launch of the Apple iTunes Store in 2001, an online platform created by Apple Inc., an American multinational technology company headquartered in California, which would change how society consumes music (Schilling, 2017). Initially, the online store provided downloads of individual songs for US$0.99 and downloads of complete albums for US$9.99, in contrast to the average suggested list price of a CD in 2001 US$14.99 (De León *et al*, 2017). iTunes became the largest music store in the United States on April 3, 2008, less than 10 years after its inception. The industry standard has been iTunes and its user ownership rights model for nearly a decade (De León *et al*, 2017).

Songs are no longer a physical good and consumers are now able to purchase digital media through their computers and cell phone devices (Schilling, 2017). After the iTunes revolution, an industry so threatened by online piracy, finally had a model to profit from digital media. Another important revolution in the music business, the music streaming services, followed this. Among the most used tools to access music today are Spotify, Deezer,

Tidal, and Apple Music (Sitonio *et al*, 2018). As proof of the influence of these channels, streaming was responsible for 58.9% of global industry sales at its peak in 2018 (IFPI, 2019). A split by segment of the revenue received by the music industry in 2019 can be seen in Figure 2.15 Audio streaming accounts for 56.1% of global music revenue overall (IFPI, 2020).

2.4. The Impact of the Internet on the Music Industry Supply Chain

The four supply chain dimensions: (1) the structure of activities, (2) the choice of players, (3) the governing mechanism, and (4) the co-ordinating structure of supply chains, which were discussed in Chapter 2.1 of this report, are used to illustrate the changes in the supply chain after the transition to the digital era.

2.4.1. The structure of activities

The Internet has changed the way record labels carry out their business operations dramatically. Electronically, internally, and externally, commodity details and information are constantly exchanged. Not only has the Internet expanded the scope of knowledge, but also the wealth of information n (Graham *et al*., 2004)

Graham *et al.* (2004), draw comparisons to how the Internet has influenced the supply chain of music by listing the characteristics of both the core traditional and Internet supply chains activities, which can be seen in Table 2.5 below.

Table 2.5. Structure of activities supply chain characteristics (Graham *et al.*, 2004).

Traditional Supply Chain	Internet Supply Chain
• Activities are serial interdependent • Sequential logic of activities in a linear value creation process • High vertical integration of activities/ resources • Physical goods/marketplaces (physical value activities)	• Simultaneous, parallel activities associated with multiple value creation processes • Focus on core competencies • Partnerships/collaborations allow sharing resources and capabilities • Increasing digital goods/marketplaces (virtual value activities)

The Internet, above everything else, has had a significant impact on how music is distributed. Music is increasingly being distributed in digital format, both legally and illegally, over the Internet. The major corporations have attempted, but failed, to set up their own online sales services in reaction to the increasing demand for digital distribution, especially in the fight against illegal distributors such as Napster (Rogers, 2013). This disruption has allowed businesses to change their strategies and has promoted partnerships between traditional music companies and specialised online distribution companies. These online distributors are now commonly used to manage online sales and delivery operations (Graham *et al.*, 2004).

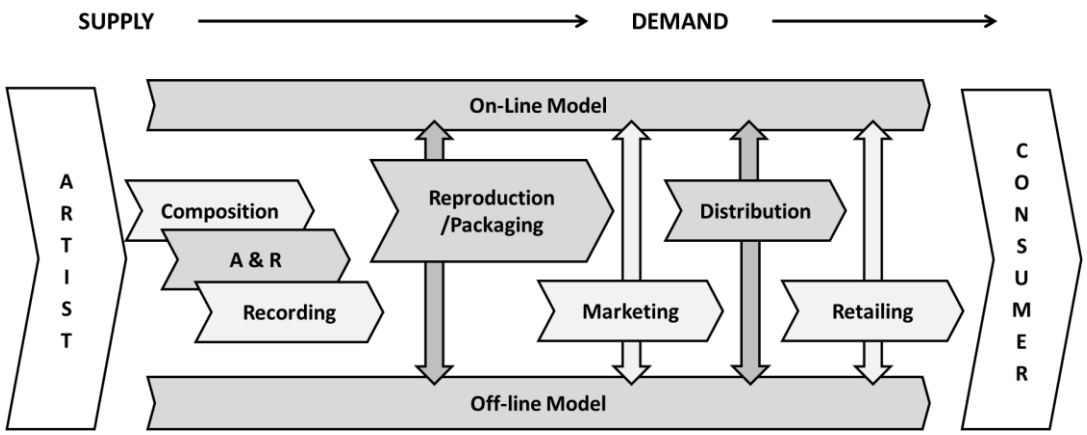


Figure 2.16. An Internet music industry value chain (Graham *et al.*, 2004)

Since the advent of the Internet, it has become much easier for record labels to enlist the help of third parties to enhance their product's value. According to Graham *et al.* (2004) company operations now tend to be more networked than ordered in sequence, as can be seen in Figure 2.16. Operations seem to be more dynamic and flexible as well. Therefore, the invention of Internet has changed the framework of activities in the music industry, in terms of virtual structures replacing physical ones, and network structures replacing sequential ones (Graham *et al.*, 2004).

2.4.2. The choice of players

The Internet has removed the need for products to be physically distributed and retailed. It also makes it easier for both consumers and those involved in making and distributing music to communicate. Therefore, new specialist companies enter the market as entry barriers are removed, creating a greater variety of potential partners and new customer and supplier combinations (Graham *et al.*, 2004). As new combinations of organisations come together, the traditional, static music industry supply chain has therefore become increasingly dynamic (Tapscott *et al.*, 2000). Despite this, all record labels also began to communicate directly with

customers, e.g., via the websites of their business as well as the signed artists' websites, concentrating not just on direct sales but on online promotional activities (Graham *et al*., 2004).

A contrast of between the traditional and post Internet characteristics of the players in the industry can be seen in Table 2.6 below.

Table 2.6. Industry player characteristics (Graham *et al*. 2004).

Traditional Supply Chain	Internet Supply Chain
• Static • Limited Choice of players (high vertical integration of record companies) • Relationships mostly long-term	• Dynamic • High flexibility in the choice of players • Relationships ad-hoc with an arising business opportunity • Relationship types range from long-term to short-term, formal to informal.

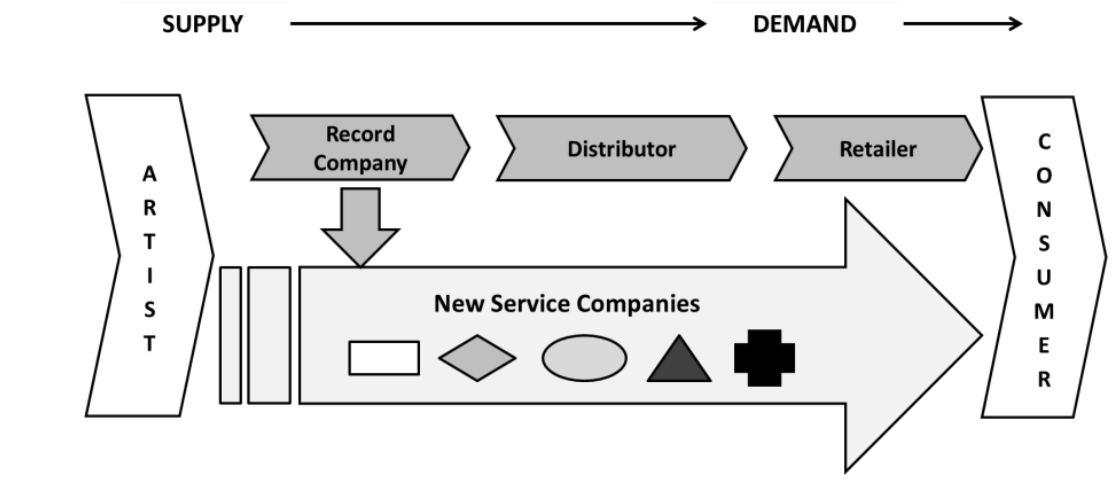


Figure 2.17. Internet Music Industry Players (Graham *et al*., 2004)

As seen in Figure 2.17, record labels have begun to outsource a variety of activities that they have historically incorporated into their supply chain, such as the creation and delivery of music (Graham *et al.*, 2004). In the digital age, the supply of music consists of many different players, because with decreasing transaction and production costs, the entry barriers

to the music industry have been significantly reduced (Graham *et al.*, 2004). Although long-term partnerships will continue to be important for major labels, Rogers (2013) predicts that the market will be made up of a more varied and fast evolving population of players who will be able to capitalise on rapidly changing circumstances and preferences.

2.4.3. The governing mechanism

As a growing number of musicians produce and sell music on their own, recording companies exhibit less governance through their supply chain (Graham *et al.*, 2004). While artists have become more self-sufficient, to benefit from their marketing knowledge, some artists continue to sign up with big record companies. In the digital age, Figure 2.18 shows the music supply chain, distinguishing between artists who try to sell directly to their fans and others who use the record labels (Graham *et al.*, 2004).

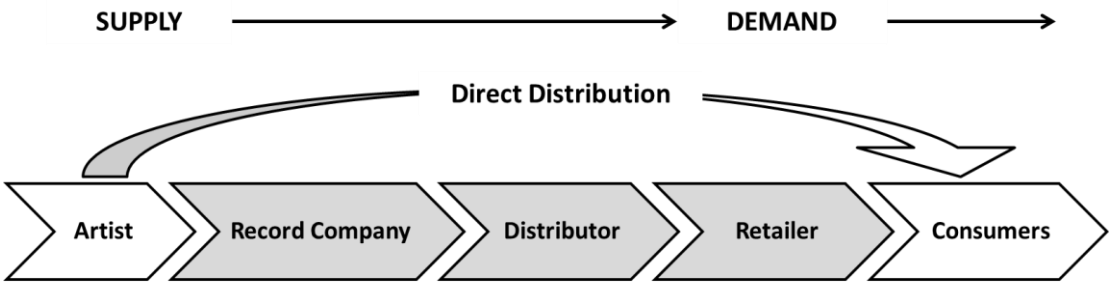


Figure 2.18. Internet Music Industry Governance (Graham *et al*., 2004)

Table 2.7 below, shows a contrast between conventional and digital era industry governing mechanisms.

Table 2.7. Conventional vs. Digital Governing mechanism comparison (Graham *et al.* 2004).

Traditional Supply Chain	Internet Supply Chain
Major record labels hold a dominant position because of: • Entry barriers owing to high business and production costs • Economies of scale and scope (competitive advantage due to high vertical integration) • Complete control over distribution	Elimination of record companies' monopolistic position: • Low entry barriers due to decreased business and production costs. • Economies of scale and scope are not applicable (vertical integration means no more competitive advantage) • Loss of the rank of gate keeper

and marketing channels • Artist dependant the on the record label • Consumers are limited (in terms of choice of music)	• Artists gain more control over music and production activities • Consumers gain bargaining power.

Therefore, as the potential now exists for the Internet to directly link artists and customers, both are gaining greater bargaining power (Graham *et al*., 2004). This declaration supports Porter's (2001, p. 66) assertion that: ". . . the Internet eliminates powerful channels and shifts bargaining power to consumers".

2.4.4. The co-ordinating structure

Graham *et al*. (2004) suggest that to support the knowledge needed to handle the selling of digital music, the existing coordination processes and frameworks would need to be modified significantly. The advent of Internet-based network technologies has empowered bodies in the industry to function in a cyber environment and interact with various suppliers and customers (see Figure 2.19). Nevertheless, doing business over the Internet presented a new challenge. When the number of product offerings increased, so did the need for digital navigators to help parties locate each other. To meet the digital user's needs, music labels and artists have had to form relationships with these online outlets (Graham *et al*., 2004). Digital navigators will easily replace the coordination role of conventional intermediaries in digital marketplaces, i.e., a service that directs businesses and people to the data they need (Graham *et al*., 2004). The number of physical intermediaries between the artist and the consumer has decreased, major labels have outsourced operations, and marketing and A&R roles have been reorganised to increase the ability to respond rapidly to market developments and new business opportunities.

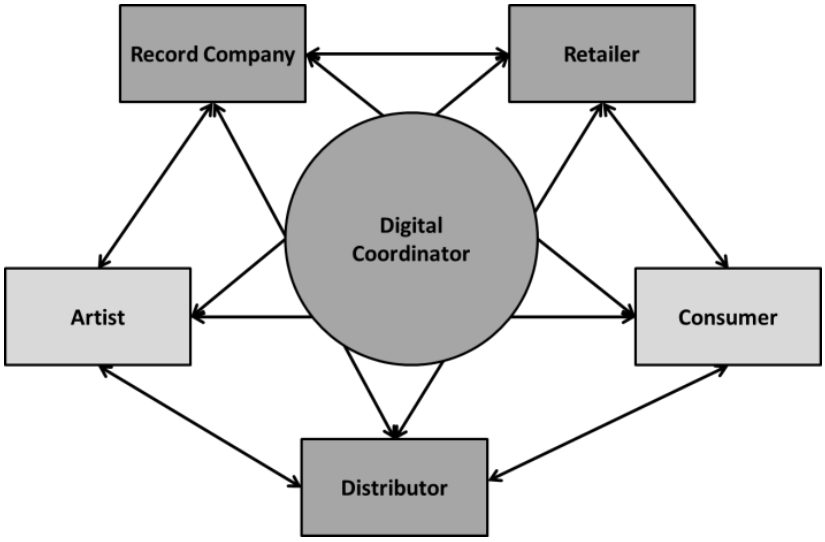


Figure 2.19. Internet Music Industry co-ordination (Graham *et al*., 2004)

Table 2.8 below, shows a contrast between conventional and digital co-ordination mechanisms.

Table 2.8. Conventional vs. co-ordination comparison (Graham *et al*. 2004).

Traditional Supply Chain	Internet Supply Chain
• Hierarchy structure • Interaction through proprietary information systems (EDI) • Sequential Communication flow • Bullwhip effect (over and underproduction) • Knowledge and commodity flow are coordinated by physical intermediaries.	• Complex pattern • Interaction through the universal and open information systems (The Internet) • Interaction with multiple suppliers or customers in real time • Reduced bullwhip effect • Cyber intermediaries become important for co-ordination structure central points

Internet platforms such as Amazon, which have allowed major labels to align their activities with customer requirements, are now the most important elements in these new network structures. The position of conventional intermediaries, such as physical distributors, is decreasing, and the Internet has become the leading electronic business infrastructure in the music industry (Rogers, 2013). Communication and collaboration in the music industry,

when anyone will interact with everyone, can no longer be hierarchical. Record labels as well as artists as have begun to communicate directly across the Internet with customers. In support of this, Graham *et al*. (2004, p.1099) state that, “The virtual marketplace has become widely accepted for music sales and distribution, although it is not clear if physical products will completely disappear. However, what is less clear is the role that the major labels will play in future.”

2.5. Labels, Artist and Consumers

2.5.1. Major record labels

Major labels have traditionally supported the biggest stars because they were able to attract a wider audience with more marketing capital and distribution platforms, allowing for major careers with global operations. However, well-known musicians have also begun their careers with independent labels (OECD, 2005).

The recorded music industry in the 1950s, 1960s, and 1970s was populated by hundreds of record labels, each with its own size, place, reach, and strength. Several waves of restructuring in the 1980s and 1990s, in which dominant labels bought or combined with smaller labels, changed the face of the industry (Hracs, 2012). By 1999, the music industry was firmly under the influence of five large corporate corporations, or "majors." These were Bertelsmann AG (headquartered in Germany), the EMI group (Britain), Seagram/Universal (Canada), Sony (Japan), and Time-Warner (U.S.) (Hracs, 2012). As of 2018, the market share was dominated by Sony, Warner and Universal, as can be seen in Figure 2.20 below.

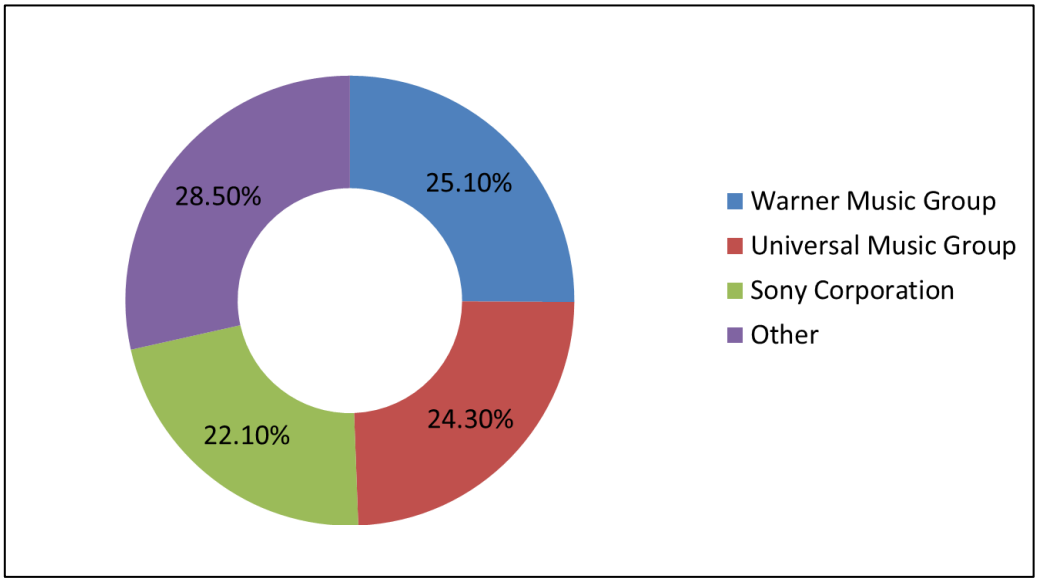


Figure 2.20. US recorded music market share 2018 (IFPI, 2019)

More than 100 subsidiary record labels or sublabels were owned by the industry's biggest players, each specialising in a different market niche. Only the most well-known artists in the industry were signed directly to the major label. More than half of the market share in the United States was held by these firms (IFPI, 2019)

A record label traditionally serves three purposes. The signing of a recording contract with an artist is the first significant feature of a record label. New artists must be discovered and signed to a contract for a new album to be produced. The record company would agree to provide the artist with several tools to aid in the creative process. A record label's second role is to provide funding to an artist and to coordinate the production of an album. The record labels effectively give the artist a loan to cover the upfront costs of making an album (Hracs, 2012).

The majors were vertically integrated multinationals in terms of structure, overseeing every part of the manufacturing process "in-house." Artist commissioning and contracting were mixed by the majors with their own recording studios, as can be seen in Figure 2.21. These multibillion-dollar conglomerates had the technology to create and package albums, as well as sophisticated marketing, promotion, and distribution networks that spanned the globe. Music publishing, legal services, sound engineering, recording, and management were among the specialised services offered by the major record labels (Hracs, 2012). Musicians who signed recording contracts developed their careers based on their artistic ability rather than technological, administrative, legal, or entrepreneurial abilities (Hracs, 2012).

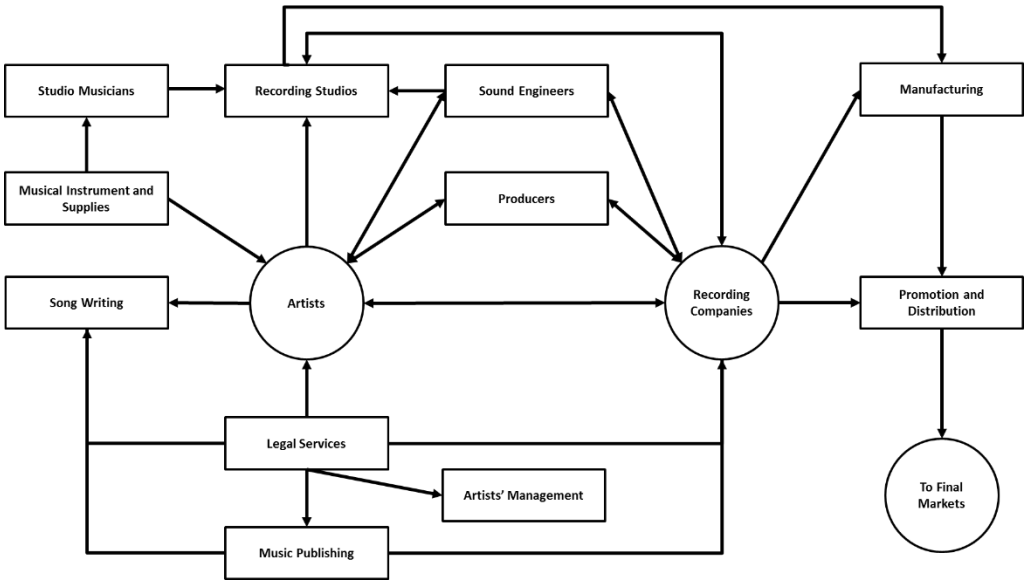


Figure 2.21. The traditional model of services controlled by the majors (Hracs, 2012).

Their label also offered a wealth of financial, technological, and business services. However, by signing a contract, musicians give up a lot of control. Signed artists were forced to work within the parameters of their label's artistic vision, relinquishing creative control over which artist to use, what songs to record, what artwork to use, which studio to record in, and how to market, package, and distribute each album (Hracs, 2012).

The music industry and technology had a mutually beneficial relationship until 1997, after which the music industry advanced in lockstep with several technological developments. As a result of technological advancements such as the advent of vinyl, cassette tapes, and compact disks, consumer electronics companies like Sony developed new markets for reproductive instruments, and major labels were able to mine their back catalogues and sell old recordings in several new formats (Hracs, 2012). Before the invention of the MP3, major labels viewed technical advancements as opportunities to resell the same music at a higher profit margin (Dos Santos, 2016). The major labels, for example, pushed hard for the integration of new formats like the CD because it allowed them to lower manufacturing costs while raising consumer prices, resulting in much higher profit margins (Hracs, 2012).

According to Rogers (2013), there was a lot of criticism when it came to the record industry's approach to the digital transformation challenge, suggesting a failure to react as quickly and efficiently as it should have been done. The digitalising process in the music industry was one of the many reasons why record labels found it difficult to adapt to modern standards. To be organisationally prepared to serve the new digital music economy, large-scale investments in technology infrastructure and the introduction of totally diverse methods of doing business were required (Mulligan, 2015).

2.5.2. Independent labels

Independent record labels, which also have their own distribution networks, make up the rest of the record industry. These small labels have a history of being catalysts for new musical trends (OECD, 2005). Smaller labels often specialise in niche categories that are difficult for larger corporations to monitor. Big record labels have often relied on smaller independent labels to find and develop new artists, either by using artists who were previously signed to independent labels or by acquiring independent labels (OECD, 2005). Despite the moderate market share of around 25% of global recorded music sales, the number of independent record labels is high, with the OECD estimating the number of record companies in the EU at around 3000 according to OECD (2005).

Despite their vast number, only a few independent record labels have significant sales or jobs. Large record companies have many advantages over small independent record labels, including access to large amounts of capital to create a large catalogue and promote younger artists, as well as large distribution and promotional networks (OECD, 2005).

Small labels are finding it much more difficult to maintain their business model, despite having more business versatility and being closer to the artists. Larger labels also manage the distribution of independent labels. Independent publishers, on the other hand, face various obstacles due to a lack of distribution networks, a reluctance to invest in vast catalogues, and hence an inability to diversify risks, even though cooperation with major record labels and the use of their distribution resources may often benefit (OECD, 2005).

Rogers (2013) notes that it will be especially interesting to see how independent record labels, particularly smaller labels, respond to new digital distribution options that allow them to expand their distribution without having to build physical distribution networks. Since the big majors' proven and advanced distribution networks is a huge competitive advantage over independent publishers, this could benefit independent labels, even though they would have to sell to big players like Apple iTunes in the online world. Independent record labels may have an advantage over large record labels because they may respond more rapidly to technological change and because the required rights agreements to sell music digitally may be less costly for them (OECD, 2005). However, forming a series of partnerships with all the major online music providers is difficult. Larger players in the music industry could still be best suited to forging such business connections (OECD, 2005).

2.5.3. Artists

For musicians, file sharing was a significant milestone and their views towards it were sharply split during the first half of the 2000s. There were some artists in support of it, while others were against it. Artists who supported file sharing did so because they saw P2P networks to make their music available to a much larger number of potential listeners (Mulligan, 2015). The artists', who were against file sharing, aligned their arguments with record labels, claiming that file sharing was destroying the music industry. Both were correct. (Dos Santos, 2016).

After the piracy boom, record labels became very cautious and, simultaneously, technology was becoming more accessible, and more people were producing music and less people were buying music (Dos Santo, 2016). In the early days of the digital age, many artists saw the

Internet as a land of opportunity, as some of them felt constrained by record label contracts and unethical practices. Many musicians, according to Mulligan (2015), were mistaken in thinking that getting a website would be enough to beat record labels and attract audiences, despite some success. However, a record label plays a crucial role in music marketing, promotion, and distribution (Rogers, 2013).

Live shows, related sponsorship, and merchandise sales were the primary sources of income for artists during the digital age. Although music sales decreased from 2000 to 2013, all three of the previously listed artist revenue streams increased. In 2000, music sales accounted for 31% of overall revenue; by 2013, that figure had dropped to 20%, while live performances increased from 39% to 45%, merchandise from 4% to 9%, and publishing from 26% to 28% (Mulligan, 2015).

Artists' different revenue sources meant that the way they measured performance was evolving as well. In the analogue period, success was determined by the number of units sold and the ranking on the charts. The number of units sold and the position on the charts determined success in the analogue era. However, many artists in the modern era appear to be underwhelming at best when measured in terms of album sales but become hyper-successful when measured in terms of social metrics (Mulligan, 2015). Before signing a record contract, artists also use social media and other online outlets to create international footprints. Labels are becoming more discerning about their spending, and they want to see that artists can create their own fan bases, which they can demonstrate by Facebook likes Twitter followers, and YouTube views. As a result, social analytics are far more important for all artists in the digital era because they are tools that can lead to sales (Mulligan, 2015).

A new breed of artists has emerged in the digital age, capable of selling out mid-sized clubs but unlikely to break into the mainstream. These musicians can amass large online followings as well as a devoted live audience. They can sell tens of thousands of albums without ever reaching the top of the charts (Mulligan, 2015).

What is interesting to note is that in the modern age, musicians who have contracts with record labels (signed artists) and artists who do not (unsigned artists) have different experiences. As a result, two viewpoints are given as examples in the following sub-chapters.

Unsigned Artists

Even if a band or artist is extremely talented, a major record label would not sign a deal with them if they were not mainstream enough. Before the digital age, artists had two options: either seek a contract with an independent label or alter their music to make it more marketable (Rogers, 2013). The digital era has ushered in a period when music has become so widely available that anybody with access to a computer can become an instant sensation (Rogers, 2013).

The growing number of digital channels for music marketing, promotion, and distribution provides existing and aspiring artists with limitless opportunities to reach audiences previously unimaginable. According to Rogers (2013), the ability to do-it-yourself (DIY) has never been greater, with young musicians having access to an unrivalled arsenal of digital tools. Some activities that used to be accomplished by labels and partners can now be completed at home using free or low-cost software. Instruments and home studios are more advanced and less expensive. Via social media, online marketing can be done for free. iTunes, Facebook, and the artist's website are all good places to start (Rogers, 2013).

Unsigned artists have a lot of potential. Many artists and managers, however, find the marketing, promotion, and distribution provided by a major label appealing. Nonetheless, signing with a major label early on is not needed. One good tactic is to raise the artist's profile, pique a major label's attention, and strengthen the artist's or independent label's bargaining power when negotiating with major labels (Rogers, 2013).

Many unsigned artists still hope to sign a record contract, but to do so; they must be willing to wait patiently without receiving any compensation. Emerging artists must cultivate a sophisticated set of social media, marketing, and business skills to ensure they can thrive financially and build a strong fan base while developing as artists to be recognised by a record label. Artists face more challenges than just living long enough to be signed by a record label. Labels are dropping artists earlier than they were in previous decades, for example, if a song does not become a radio success (Mulligan, 2015).

Unsigned artists also take advantage of record labels' services, such as distribution, where they collaborate with the label to distribute their music exclusively through their well-established infrastructure. The artist retains the copyrights, giving them more freedom and control (Mulligan, 2015).

Signed Artists

Given the change in artist revenue away from music sales, labels attempted to cash in by introducing 360° Degree Deals, which require artists to sign over a portion of their additional profits to the labels (Mulligan, 2015). A signed artist usually relinquishes ownership of their albums, as well as other rights including the freedom to compose music for movies and advertisements. They also forego other sources of revenue from the record and non-record industries (Mulligan, 2015).

Record labels make an initial investment in artists, which is repaid after the album is released, and the artists then start making money. However, some musicians claim that these funds are never returned to them. They claim that record labels keep the money received in advance from streaming platforms and that there is little transparency in how artists are paid (Dos Santos, 2016). As a result, to decide whether a record deal makes sense, the artist must first determine whether a record deal can generate more sales. This model works better for a mainstream artist than for a niche artist (Mulligan, 2015).

As a result, artists are trying to resolve their love for music with the need to be mindful of the financial incentives for their talents, as only a small portion of the money goes to artists as ongoing income after the initial recording advances (Dos Santos, 2016).

According to Dos Santos (2016), artists receive approximately 68 cents of a $9.99 monthly subscription fee. Songwriters and publishers each receive a 10% share of the subscription fee. Record labels retain 73% of the royalties charged to right owners by streaming services. It is worth noting that the information given to artists and authors in exchange for royalties is often ambiguous. As a result of the current complicated and unreliable scheme, major labels, and publishers' profit, while streaming platforms have little desire to invest in transparency in their reporting and accounting processes because they are costly (Dos Santos, 2016).

The following (Table 2.9) is a representation and contrast of the music industry from the perspective of an artist, with the "old model" being signed artists and the "new model" being unsigned artists in the digital age (Dos Santos, 2016).

Table 2.9. Music business model comparison from the artist's point of view (Dos Santos, 2016)

Music Business 2.0	
Old Model	**New Model**
Compartmentalised	Integrated
Multiple Service providers	DIY
Larger up-front investment	Pay as you go
Sale of rights/ownership	Retain Rights
Driven by a monopoly	Powered by meritocracy
Get signed or get lost	Fan relationships create value pipeline

2.5.4. Consumers

Prior to the Internet, the bulk of new music that reached audiences came through television and radio, and consumers bought CDs and cassettes from physical retail stores or from mail-order catalogues (Graham *et al.*, 2004).

Consumers bought music released on plastic discs or cassettes, according to the dominant music distribution model of the previous century (Wikström, 2012). They keep the discs in their homes, often in expensive wooden cabinets custom-made for the purpose. They admired their collection of music as much as other material possessions like cars, clothing, and furniture, and they felt a strong emotional attachment to it. Record labels prefer to perpetuate this sense of ownership by using verbs like "buy," "own," and "steal" in their advertisements, even if they only give their users a limited license to listen to the songs. The "ownership model" is the name given to this model (Wikström, 2012).

Consumers continued to have more choices on how to consume music as the digital age progressed. There were many channels for getting free pirated music that appeared to have a better user interface than appropriate channels; it was also possible to buy a single rather than an entire album; personal computers came with CD recorders; and MP3 player storage space was always amplified (Wikström, 2012). Exploring more music seems to be simpler than before, allowing tastes to expand. Recently, the principle of ownership has been replaced by the access model, in which customers download the music they want to hear. As a result, customers were motivated because they could pick the most convenient way to listen to music (Wikström, 2012).

Instead of rows of CDs or LPs on a rack, ownership was later measured in terms of digital files on a consumer's hard drive or in the cloud (Mulligan, 2015). There are a slew of new technologies and channels that enable access to and distribution of large amounts of music in ways that previous generations could not (Rogers, 2013).

Dos Santos (2016) looked at how people spend money on music and discovered that 31% of consumers spent money on live music, 10% on music festivals, and 5% on DJ activities (Figure 2.22). Surprisingly, just 7% of those who are devoted to music respond to streaming music subscriptions, according to the report.

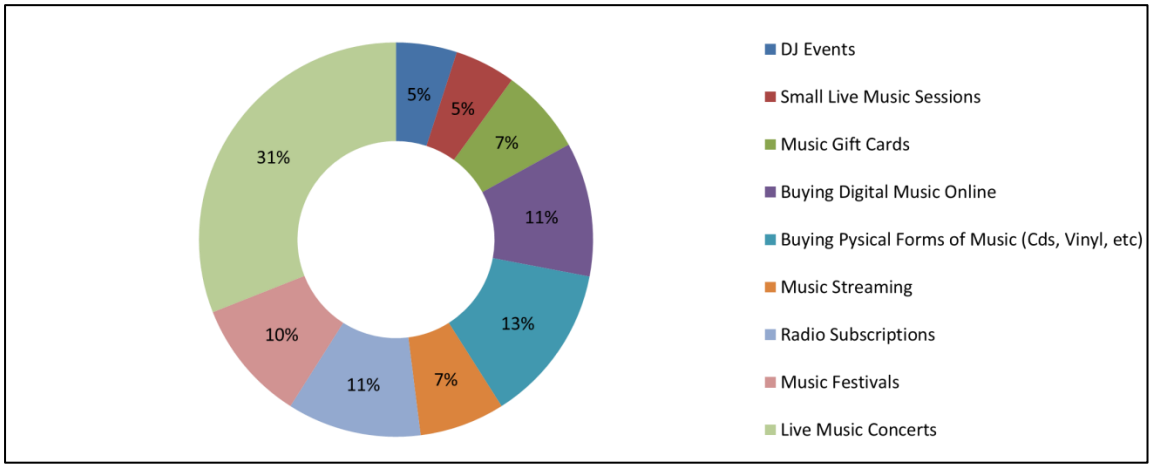


Figure 2.22. How consumers spend on music (Dos Santos, 2016)

Streaming services are becoming increasingly common, allowing providers to reach millions of listeners and diversify their revenue streams. In return for ads, they sometimes allow users to listen to music for free. Streaming services aim to turn a substantial number of listeners into paying, ad-free subscriptions, which produce more revenue than advertisements (Dos Santos, 2016)

2.6. The Fourth Industrial Revolution

The World Economic Forum (Davis, 2016) describes the Fourth Industrial Revolution (Industry 4.0) as the advent of “cyber-physical systems” involving entirely new capabilities for people and machines. It builds on the foundations laid by the first three industrial revolutions (Schwab, 2017). In the 18th century, the invention of the steam engine led to the first industrial revolution, allowing the mechanisation of manufacturing for the first time, and pushing social change as citizens became increasingly urbanised. Electricity and other technological advances contributed to mass production in the second industrial revolution. The advent of computers and digital technologies saw a third technological revolution,

starting in the 1950s. This has resulted in growing production automation and the disruption of industries such as banking, electricity, and communications (Schwab, 2017).

Industry 4.0 is based on the Third Revolution, marked by a blend of innovations that blur the boundaries between the digital, physical, and biological spheres (Schwab, 2017). There is no historical precedent for the pace of recent breakthroughs and innovations. In comparison to previous industrial revolutions, the fourth revolution is progressing at an exponential rather than linear rate. Almost every industry in every country is disrupted, and these changes have a significant impact on the growth, management, and governance processes (Schwab, 2017). Genome editing, modern modes of machine intelligence, breakthrough materials and governance approaches that rely on cryptographic methods such as Blockchain are examples of the Industry 4.0 (McGinnis, 2018).

Marr (2020) lists and describes technologies that characterise the fourth industrial revolution below:

- **Artificial Intelligence and Machine Learning**

The ability of a computer to learn and work intelligently is referred to as artificial intelligence (AI) and machine learning. Using data to infer that computers can now make decisions, complete tasks, and even forecast future outcomes (Marr, 2020).

- **The Internet of Things**

The Internet of Things (IoT) refers to the growing number of Internet-connected devices and objects that collect and distribute data. The technology is intended to bring the digital and physical worlds closer together (Marr, 2020).

- **Robots and Cobots**

Robotics is a rapidly emerging area, and today's robots can be described as intelligent machines that can understand and react to their environment autonomously, as well as perform routine or complex tasks. Unlike industrial robots, collaborative robots (cobots) are specifically designed to interact with humans physically in collaborative environments, changing production processes by operating efficiently, securely, and skilfully with human employees on a variety of tasks (Marr, 2020).

- **Virtual Reality and Augmented Reality**

Virtual Reality (VR) and Augmented Reality (AR) are innovations that use computer science to merge the physical world and the digital world to enrich both users' and consumers' visual experiences by creating immersive experiences. AR is a technology that enables our view of reality to be superimposed on virtual elements, and VR is a computer-generated world of scenes and objects that seem real, making the user feel immersed in their environment (Marr, 2020).

- **Big Data**

In simple terms, “big data” refers to the exponential explosion in the amount of data being produced in the increasingly digital age. Big data is the set of technologies that have been built to store, analyse, and manage this bulk data. Technologies that were created to recognise trends in complex information to design smart solutions (Marr, 2020). Big data allows management and analysis of data for business purposes which is especially important as business strategies are formed or decisions are taken. It is used today in fields as varied as gambling, medicine, farming, and the conservation of the environment (Marr, 2020).

- **Blockchains**

In simple terms, a Blockchain or distributed ledger is a kind of highly secure database, a way to store records.

- **Cloud and Edge Computing**

Cloud computing involves storing and processing data in a data centre on other people's machines across a network that allows businesses the ability to store and process large quantities of data in almost real-time. The processing of data on devices such as smartphones refers to edge computing.

- **The 5G network**

5G refers to the fifth generation of cellular network technology, which would allow much faster and more efficient wireless networking, as well as the ability to link an increasing number of devices and provide richer, more diverse data streams.

- **3D and 4D printing**

4D printing uses 3D printers without wires or circuits to produce live, three-dimensional artefacts. It does so by using smart materials which, when they receive an external stimulus, can be programmed to change shape, colour, or scale.

- **Autonomous Vehicles**

An autonomous vehicle, whether it is a car, truck, ship, or other vehicle, can sense what is going on around it and operate without human interference.

- **Genomics and Gene Editing**

Genomics is a branch of biology that focuses on deciphering and manipulating the DNA and genomes of living organisms. Gene editing is a collection of technologies that allows for genetic modification of living organisms' DNA and genetic structure.

- **Quantum Computing**

Quantum computing takes advantage of the peculiar phenomena that occur at the subatomic level, such as quantum entanglement, quantum tunnelling, and quantum particles' ability to exist in several states at the same time.

The Fourth Industrial Revolution has the potential, like the revolutions that preceded it, to increase global income levels and boost the quality of life for populations around the world (Schwab, 2017). Consumers have been able to afford and navigate the digital world to date, and technology has enabled the creation of innovative products and services that enhance the quality and enjoyment of our personal lives. In the long run, technological innovation will also lead to a supply-side miracle, with quality and efficiency improvements. Transportation and communication costs will decrease, logistics and global supply chains will improve, and trade costs will decrease, all of which will open new markets and spur economic growth (Schwab, 2017).

2.6.1. Industry 4.0 and Supply Chain

The arrival of Industry 4.0 is signalling the next era in supply chain management. Supply chain management, defined by Jacobs *et al.* (2009, p.17), as "… a total systems approach to managing the flow of information, materials and services from raw material suppliers through factories and warehouses to the end customers". This new age would put suppliers and clients together in an entirely new way, blurring the borders between the digital and physical worlds with Industry 4.0 technology and erasing conventional organisational boundaries (BDO, 2019).

Another term that is also becoming established alongside Industry 4.0 is Supply Chain 4.0, which is defined by Ferrantino *et al.* (2019, p.104), as "… the re-organisation of supply chains – design and planning, production, distribution, consumption, and reverse logistics using technologies that are known as Industry 4.0". Supply Chain 4.0, while enhancing

versatility, aims to reduce inefficiencies and lower costs (BDO, 2019). It provides opportunities, but it also poses some of the key challenges in supply chain management, Binder Dijker Otte (BDO, 2019) have outlined some of the ways in which Industry 4.0 is disrupting the traditional supply chain model.

- **The Intelligent Supply Chain**

Recent advancements in supply chain technology give companies real-time insights into status and location (BDO, 2019). "Smart logistics" can be revolutionary, concepts such as automated warehousing, cargo monitoring and remote fleet management. The web provides real-time data on supply chain disruptions or quality issues that can be fixed with minimal human intervention immediately (Rathore, 2018).

- **Demand-Driven Supply Chain Management**

Big Data analysis to enhance the precision of demand forecasting and replenishment. To predict demand, identify trends and foresee changes, predictive analytics and machine learning may account for additional variables (BDO, 2019) more reliably.

- **Evolving Customer Expectations**

As consumer buying preferences shift, several manufacturers are re-evaluating their delivery models. The retail and manufacturing customers of today have no patience for delayed or incorrect orders, which means that logistics and delivery must happen at lightning speed, from warehousing to order fulfilment to shipping. Hyper-customisation, known as the future of production, explicitly ties consumer preferences to the supply chain (Rathore, 2018).

In short, the future will change the way the traditional industry functions, automating thousands of processes throughout the supply chain.

2.6.2. Industry 4.0 and Music

Similarly, in the music industry, there are studies and projects in the technology world aimed at changing how music is created and consumed.

Artificial intelligence and Machine Learning

The science of teaching computers to perform human tasks is known as artificial intelligence (AI). Machine Learning is a branch of artificial intelligence that teaches machines how to think. Machine learning algorithms search for patterns in data and try to make inferences (Frankenfield, 2021). Another AI feature is deep learning, which allows for machine learning by absorbing large quantities of unstructured data such as text, images, or video

(Frankenfield, 2021). AI research mainly produces problem solving systems that help in making human decisions. AI study mostly results in problem-solving systems that assist humans in making decisions. Artificial intelligence (AI) automates services, finds trends and observations in massive data sets, and aids in the creation of efficiencies (Frankenfield, 2021). AI is often used to solve problems like diagnosis, architecture, and optimisation. These problems frequently have complex solutions, allowing the AI system's findings to be compared to similar human-generated solutions. Other examples of the use of AI include the use of the healthcare industry of drug dosing and various therapies in patients, and in the operating room for surgical operations, chess machines and self-driving vehicles (Frankenfield, 2021).

In the music technology world, there is a clear drive to make computers and robots create music. The most recent advancement is the creation of music using AI. The area of AI-assisted music has seen a dramatic growth in capacity and performance over the last two years. Projects like Google's Magenta, IBM's Watson and Sony's Flow Machines have taken their own shot at feeding musical laws and information into machines to teach them how to imitate human imagination and produce original music (Titlow, 2017). Algorithms and machine learning are also used by music streaming platforms like Tidal, YouTube Music, and Soundcloud to figure out their users' music preferences and listening habits. Thanks to systems that optimise and prioritise the user experience, we have reached a new world of music discovery (Cole, 2019).

Big Data Analytics

ORACLE (2021) defines big data as data that contains greater variety arriving in increasing volumes and with ever-higher velocity. To simplify, Big data, is data from completely new data sources, is larger, and more complicated. Latest technological breakthroughs have reduced data storage and processing costs exponentially, making it simpler and less costly to store more data than ever before. More detailed and reliable business decisions can be made with an increased amount of big data that is now cheaper and more available (ORACLE, 2021). Most people agree that, 80% or 90% of the data we have today was generated in the last two to three years (Ismail, 2019).

Spotify, the world's largest streaming music service, has a history of breaking technical boundaries and driving success using big data, artificial intelligence, and machine learning (Marr, 2017). With tens of millions of users listening to music every minute of the day,

brands like Spotify collect a mountain of implicit consumer data consisting of song preferences, keyword preferences, playlist data, geographic location of listeners, most used devices and more (Sen, 2020). Big data analytics also helps to produce data on what motivates a listener, so that digital marketers understand why certain artists are more successful than others. This helps businesses recognise which of their business models are becoming redundant (Marr, 2017). Data is at the heart of everything at Spotify. This data is used to train algorithms that extrapolate specific insights from the website's music and artist content, as well as online conversations and customer data, to improve the user experience (Sen, 2020).

In the age of streaming services, these services use data to send listeners songs they have never listened to before and would have never discovered otherwise. The suggestions are created based on the consumer's search history pattern and potential music preference. Machine learning enables the suggestions to improve over time. Not only does it keep users coming back it also enables greater visibility for artists who consumers may not search for organically (Sen, 2020).

Blockchain

In today's digital age, storing, authenticating, and protecting data presents serious challenges for many organisations (Marr, 2020). Blockchain technology is a type of distributed ledger or database that holds digital transactions records. Rather than providing a central administrator like a traditional database, a distributed ledger offers a network of chronologically evolving replicated databases that are coordinated using the Internet and open to anyone within the network (e.g., banks, governments, and checking companies). Blockchain networks can be either private, with limited membership, like an intranet, or public, with global access, like the Internet (De León *et al*., 2017). Marr (2020) predicts that Blockchains will transform how banks operate and how people keep their possessions.

Music can currently be streamed and downloaded at the click of a button, but payments can be slow and invisible to the people who make the music. In contrast to a world of non-disclosure agreements and black boxes, Blockchain technology provides transparency throughout the supply chain, enabling artists and their managers to see precisely how much money they are owed (De León *et al*., 2017). Blockchain's distributed, transparent, and cryptographic design enables people to trust and transact P2P with each other, rendering the need for intermediaries obsolete. This offers possible security advantages as well. While

some of the predictions made for Blockchain technology are premature, it seems to have the potential to change the music industry at least (De León *et al*., 2017).

The problem of finding a real copyright holder could be solved by Blockchain technology and the difficulty of monitoring derivative works via the Blockchain could be eased. This will make it possible to see not just the creators, but also others in a distributed ledger who were materially involved (De León *et al*., 2017). The actual dynamic value of a product (e.g., song or piece of music piece) could therefore be calculated by monitoring a complex system of relationships and enable micropayments to investors without resorting to intermediaries (De León *et al*., 2017).

2.7. Technology Companies in the Music Industry

Large technology firms have also started to exert leverage over some aspects of the music industry by acting as distributors. Companies like Amazon, Google, Apple, and Spotify make a lot of money even though they do not make their own content because they have established themselves as trustworthy music retailers (Stabnau, 2016).

Technology companies have recently shown signs of shifting their focus to content development as a complement to their distribution channels (Stabnau, 2016). Businesses like YouTube, Apple, and Spotify, like a record label, have all the resources at their disposal to find, record, create, and sell original material for their own artists, and all have taken measures that show they are moving in this direction (Stabnau, 2016):

2.7.1. Google and Youtube

Lyor Cohen's experimental record label, 300, received a $5 million investment from Google in 2013. Google appointed Cohen to be the Head of Music at YouTube, the streaming channel owned by Google, after investing in the record label (Stabnau, 2016). Lyor Cohen, according to Stabnau (2016), is one of the most prominent music executives of the last 30 years, and Cohen brings a wealth of music industry expertise to the technology business. In 2016, in an interview with Billboard Magazine, Cohen said that, as Head of Global Music his three main goals were “To help the music community embrace technological shifts, to break new songs and artists through YouTube’s distribution platform, and to work toward a more collaborative relationship between the music industry and the technology industry.” (Rys, 2016) (n.p). Google Ventures, the company's venture capital arm, has also made a $60 million investment in Kobalt, a music publishing firm that specialises in royalty collection (Mitchell, 2015)

YouTube developed a data resource called "YouTube For Artists" with the aim of providing musicians with analytics on how people are reacting to their music (Peoples, 2015). As the world's largest streaming service, YouTube has access to an unprecedented amount of data, allowing the company to excel at artist discovery and create original content with a potential unmatched by any record label (Stabnau, 2016).

Google and YouTube have vast resources in a variety of fields related to the music industry. If Google or YouTube decides to make original music, they will be able to find, record, distribute, and publish music faster and more efficiently than any other record label (Stabnau, 2016).

2.7.2. Apple

Apple has started to work on original music, but it is their proprietary material that most closely resembles that of a record label (Stabnau, 2016). Apple is looking for people with "senior level entertainment and media experience" to devise, build, and manage a multi-faceted original content and live projects program for Apple Music, iTunes, and the App Store (Stabnau, 2016).

Apple Music is now cultivating partnerships with musicians and other stakeholders in the music industry. Apple has tried to work cooperatively with musicians to counter claims that streaming platforms and musicians do not get along (Stabnau, 2016). While Spotify has been chastised for not paying royalties, Apple has signed exclusive distribution agreements with major artists and major independent record labels. They have also recruited several major label and music industry executives, including Jimmy Iovine, the co-founder of Interscope Records, to help them establish relationships with artists in the same way that a record label would (Constine, 2015).

2.7.3. Spotify

Spotify also launched two new programs: Spotify Singles and Spotify Live, both of which produce original material (Stabnau, 2016). Artists on Spotify Singles record original music as well as cover other artists' songs, which are new performances or recordings of a song by someone other than the original artist or composer. These songs were recorded at a Spotify-owned studio in New York City and are only available on Spotify. Artists performing live in-studio shows are featured on Spotify Live.

According to Stabnau (2016), Spotify is the most like a record label of the three. They have a wealth of analytic data, including weekly playlists featuring viral songs and artists, which can be used in artist discovery. They have the financial resources to record music, either by their own studio or through investing in an artist's album. They have one of the most used distribution systems on the planet.

2.8. The South African Music Industry

This paper examines the local market conditions in South Africa, as well as the development, selling, and distribution of local music. The current state of the local supply chain and how it is managed.

South Africa's music industry is the most established on the African continent (IFPI, 2014), with a long history of multinational companies tangled with a critical domestic industry. Many musicians and former employees of record labels have chosen to start their own labels in the post-apartheid period, resulting in a rapid expansion of the independent scene (Pietilä**,** 2009). The total value of South Africa's recorded; live music and podcast revenue was R2.44 Billion in 2018, an 8% increase from the previous year (PWC, 2019), as can be seen in Figure 2.23.

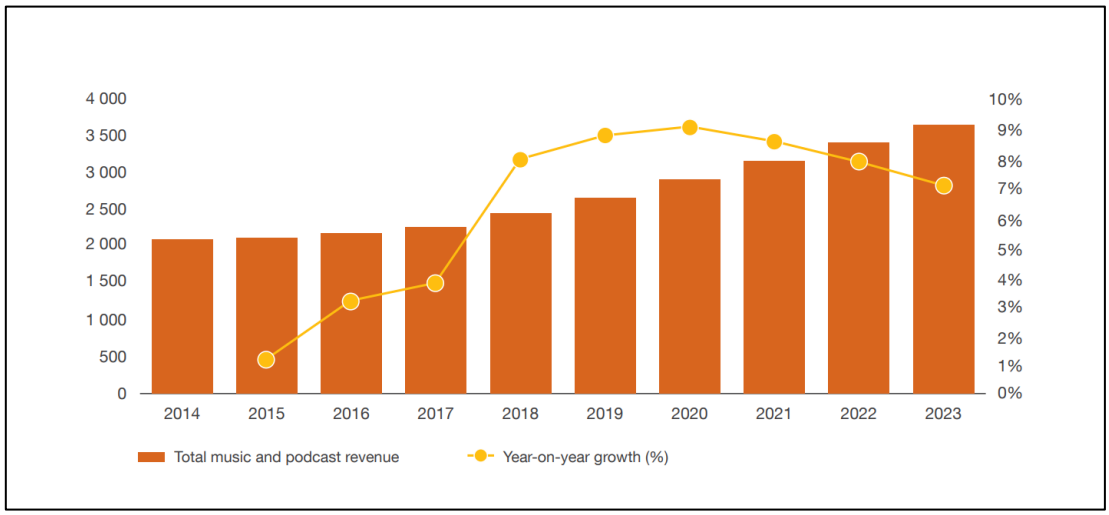


Figure 2.23. South African recorded, live music and podcast revenue (R millions) and year-on-year growth (%), 2014-2023 (PWC, 2019)

The physical recorded music segment in South Africa has been declining, as shown in Table 2.10. The physical music segment produced R192 million in revenue in 2018, down more than 31% from the previous year. Recorded music revenues, on the other hand, continue to

grow in value as digital revenue more than balances the decline in physical sales (PWC, 2019).

Year on year, digital downloads fell by 11% to R151 million in 2018. Music streaming is on the rise, with an R117 million increase between 2017 and 2018. Consumers can select from a variety of music streaming services, and there is still a need for subscription-based services. In 2018, digital music streaming revenue reached R325 million, up nearly 57% year on year (PWC, 2019).

Table 2.10. South African recorded, live music and podcast revenue (R millions), 2014-2023 (PWC, 2019)

	Historical data					Forecast data					CAGR %
Category	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2018–23
Physical	**728**	**562**	**463**	**280**	**192**	**128**	**84**	**53**	**32**	**19**	**-37.2%**
Digital	**214**	**279**	**350**	**425**	**514**	**614**	**704**	**781**	**838**	**867**	**11.0%**
Downloads	136	153	165	170	151	128	106	84	62	44	-21.8%
Mobile	44	59	68	48	38	30	23	17	12	8.4	-26.1%
Streaming	35	67	118	208	325	456	575	680	764	815	20.1%
Streaming subscription	5.9	27	76	171	283	411	528	630	709	756	21.7%
Streaming advertising	29	40	42	37	42	45	47	50	55	59	6.7%
Performance rights	72	110	115	195	228	254	281	309	337	365	9.8%
Synchronisation	21	31	32	16	17	18	19	19	20	20	3.3%
Total recorded music	**1 035**	**983**	**961**	**915**	**951**	**1 014**	**1 088**	**1 162**	**1 227**	**1 270**	**6.0%**
Live music ticket sales	811	865	924	1 006	1 094	1 185	1 282	1 379	1 481	1 584	7.7%
Live music sponsorship	235	253	273	300	329	359	391	426	453	482	7.9%
Total live music	**1 046**	**1 118**	**1 198**	**1 306**	**1 423**	**1 544**	**1 673**	**1 806**	**1 934**	**2 066**	**7.7%**
Podcast advertising revenue	4.7	9.4	19	38	66	98	138	181	237	302	35.5%
Total music and podcast revenue	**2 085**	**2 110**	**2 177**	**2 259**	**2 440**	**2 656**	**2 899**	**3 149**	**3 397**	**3 638**	**8.3%**
YOY growth (%)		***1.2%***	***3.2%***	***3.8%***	***8.0%***	***8.8%***	***9.1%***	***8.6%***	***7.9%***	***7.1%***	

Note: 2014-2018 have been updated to reflect most recent available financial information.

2.8.1. The artists

The South African music scene is a vibrant mix of new and established musicians, groups, and bands, as well as established artists who have been around for a long time. The same artist segments apply to the South African music industry as they do to the global music industry.

- **Independent artists**

This group of artists has not signed a recording deal with a record label, as described in Chapter 2.4. They oversee managing their own careers as well as ensuring that their product, which includes recording, producing, selling, and distributing records, reaches the market. They would also organise their own events, tours, and public appearances. The singers retain all the profits from the sales of their titles and do not have to share it with a record label, which is one of the most significant advantages of taking this path. These musicians, on the other hand, also become "jacks of all trades" because they are self-taught.

- **The signed artists**

This group of musicians agreed to sign a publishing contract with a record label for a set period or a certain number of albums to be recorded and published by that label. The record label is responsible for supplying the funds and other services needed to finance and market the career of the signed artist or band. Any part of the supply chain is under the control of the record label, including manufacturing, sales, promotion, physical delivery, debt collection, and revenue distribution.

2.8.2. The record labels

The major and independent labels operating in South Africa, as described in Chapter 2.4 of this paper, are briefly discussed on the following sections:

The majors

The three major companies all have subsidiaries in South Africa, and Sony and Universal held 77% of the physical records market share in 2016 (Shaw, 2017). South African music can now be distributed in both domestic and foreign markets thanks to this international network. The South African majors, commonly known as the "Big three", are listed and briefly discussed below:

- **Sony Music Group**

Out of both independent and major record labels, Sony Music has had the most significant impact on global music production and has made music accessible to the public in a tangible way (Steyn, 2005). Marketing and tie-ins, discovering and producing musicians, various entertainers, and producers, as well as creating new platforms in the entertainment industry for digital content, live entertainment, music streaming, and sports entertainment, are all part of Sony's operations (Steyn, 2005).

- **Universal Music Group**

UMG is based in Los Angeles, California (USA) and has 47 branches in 41 countries. The prestigious Rondor Music Catalogue, which has over 60 000 titles, is part of the Universal Music Group. Just a few of the well-known record labels in their portfolio are Momentum Publishing, Interscope, and All Nations Music. U2, Prince, Westlife, and Bon Jovi are among the most well-known musicians of the twenty-first century who have signed with Universal (Steyn, 2005).

- **Warner Music Group**

Warner Music Group (WMG) is a global entertainment and record label conglomerate based in New York City. Elektra Records, Warner Records, Parlophone Records, and Atlantic Records are among the company's biggest and most influential labels. Warner Chappell Music, one of the world's largest music publishers, is also owned by WMG. After Universal Music Group and Sony Music Entertainment, it is one of the "big three" recording companies and the third largest in the global music industry (Warner Music Group).

The independents

Local independent record companies are the second form of record company operating in South Africa. They are much smaller than the multinational companies listed above, and they mostly hire local artists.

Steyn (2005) notes that the number of foreign independents operating in South Africa has been rising, especially record labels from across the African continent that are now promoting and selling their music in the country.

Notable South African independent music labels are mentioned and briefly discussed below:

- **Gallo Records**

Gallo Records launched famous artists such as Ladysmith Black Mambazo, who had the first gold-certified album by a black artist in Apartheid-era South Africa. It was also the birthplace of South Africa's best-selling reggae artist and political activist, Lucky Dube, whose songs like "I'm A Prison" exposed apartheid's repressive regime (SA Music Mag, 2019).

- **Supper Black Tapes**

Supper Black Tapes, based in Johannesburg, is home to a new wave of deep African house artists such as T.Siza, Fred Buddah, and Ofuren. Dedicated to only releasing music by African musicians. Super Black Tapes has been around for over 5 years and was formerly known as "Roots Go Deep Music" before rebranding in 2016. “The label is an Art Gallery, where each song chosen is a painting, chosen to further the musical identity, philosophy, and ideals of Super Black Tapes,” one of the label's creators says in an interview (Ademeso, 2020).

- **Kalawa Jazzme**

Kalawa Jazmee (also known as "KJ Records") is a South African independent record label that was instrumental in the creation of the "Kwaito" musical style. When it was formed in 1992, it was known as Kalawa, and it went on to sign acts including Boom Shaka, whose debut album "It's About Time" was released in 1993. Kalawa-Jazmee Records was founded in 1995 after joining forces with Trompie's label Jazmee. Oscar Mdlongwa, Bruce Sebitlo, Zayne "Mahoota" Sibiya, Mandla "Spikiri" Mofokeng, and Emmanuel "Mjokes" Matsane remain at the helm of the label, with Gao Mokone taking over as Label Manager (SA Music Mag, 2019).

- **NON**

This is a group of record labels from all over Africa – Cape Town, Lagos, Kinshasa – that release more experimental electronic music from the continent. The ethos states, "To articulate the visible and unseen processes that create binaries in cultures and, as a consequence, distribute control." (Ademeso, 2020).

- **Süd Music**

Südelectronic was one of the first South African electronic music labels to gain worldwide success, with offices in Johannesburg and London. Remixes and production were added to the album by Tama Sumo, Mary Boloi, Jan Jelinek, Marco Shuttle, Portable, Cassy, Caswell James, Anthony Shakir, and others. Südelectronic continued to hold events in London for the next 11 years (Ademeso, 2020).

2.8.3. The trade

Steyn (2005) describes the trade as a player who purchases finished products such as CDs (compact discs), tapes, videos, and DVDs (digital versatile discs) directly from major or independent record labels, or sometimes from each other (dealers buy from wholesalers). They mark up the commodity significantly and then market it to the public. South African traders are classified into four groups.

- **Wholesalers**

The main characteristic of a music wholesaler is that it buys in bulk with the intention of reselling to other business customers. It has the most bargaining power with record labels because of the large number of units it buys on a nearly daily basis, and therefore offers the

better prices - they are primarily price driven. While it sells directly to the public from its factory-like stores, its primary goal is to act as a "middleman" and sell to other distributors (Steyn, 2005).

The country's largest music wholesaler, Reliable Music, was based in Crown Mines, Johannesburg, Gauteng. They had vast inventories, often worth more than R30 million. Reliable's Managing Director stated in a personal interview that he was personally responsible for all stock orders from record labels. The Reliable client base included hundreds of small dealers and independent stores from all over the country, including the Northern Cape, Limpopo, and the Free State (Steyn, 2005).

- **Dealers**

Record labels and wholesalers, such as the ones listed above, will sell directly to music stores. They are always attracted to bargains and will purchase from whoever can provide them with the best deal. Music Moods in Centurion (Gauteng), Blue Note CDs in Pretoria (Gauteng), Ziggy's in Potchefstroom (North West province), and Planet CD in Bellville (Western Cape) are all South African music stores (Steyn, 2005).

- **Retailers**

Record labels sell directly to retailers and chain stores. They have a single headquarters and plenty of other locations across the country, as well as in neighbouring nations. They place a higher value on customer service and have very short lead times (Steyn, 2005): Here are some well-known local examples:

- CNA has approximately 150 stores in South Africa that sell music (CNA has streamlined their service offering and some stores now only sell books and games, while others only sell stationary and greeting cards) (Steyn, 2005)
- CD Warehouse has three locations in Gauteng and Kwa-Zulu Natal (Steyn, 2005).

Some of the notable mentions are:

- Musica, which is headquartered in Cape Town with, at one point, had 130 outlets in South Africa, and various more in the neighbouring countries. Since the start of the year 2021, 19 Musica stores were shut down, while the rest are scheduled to close by 31 May 2021. The parent Group, citing digital disruptions as one of the causes of the retail outlets' demise (Phillip, 2021).

- Look & Listen, which was headquartered in Bedfordview, Johannesburg with ten outlets nationwide, was an iconic South African music shop for many years (Smith, 2017). Look & Listen stopped accepting online orders in February 2013, and the firm was put in business rescue in June 2014. The last store eventually closed in 2017 (Smith, 2017).

Retailers make a lot of noise about their products and advertise aggressively. Since they all hold the same music titles (same Product) at the same price, they concentrate on the other two "Ps" of marketing, Place and Promotion, to set themselves apart from their many rivals (Steyn, 2005).

a) Location: they are in densely populated and regularly visited shopping centres, and they use attractive store interiors, multi-coloured banners and posters, and loud music to try to create an entertaining shopping experience.
b) Promotion: they advertise heavily, investing millions of Rands on television, radio, and print ads.

- **Independent Stores**

The stores in this group are considerably smaller than those in the previous three. They typically buy in small amounts from record labels or the wholesalers listed earlier. They purchase only what their local market needs and maintain as little inventory as possible. They have no negotiating power and must pay far higher prices than their industry's other rivals. Many of them offer radios, portable appliances, mobile phones, and inexpensive jewellery in addition to music (Steyn, 2005).

2.8.4. Revealers

Shaw (2017) defines revealers as business entities that expose music to the market and lead market taste and development.

- **Internet and Mobile Cybermediaries**

An Internet cybermediary (from the word intermediary) includes artist websites, industry websites, mobile applications, and retailer and utility websites. They are almost everywhere on the Internet where you can buy or borrow music for free. They provide digital content or subscription packages to customers, as well as sampling and advertising opportunities. The Internet is well-suited to medium-free (i.e., no packaging) music distribution. Electronic and

electronic commerce have rapidly progressed into contemporary modes of entertainment. Music and video can now be played and received on a variety of handheld devices, including MP3 players, cell phones, tablets, and even the television (Shaw, 2017).

- **Live Music Facilities**

This includes places like nightclubs, bars, music halls, and stadiums. Live music venues increase exposure and appetite for music. Two live music organisations that serve technical equipment and companies are SARA (South African Roadies Association) and TPSA (Technical Production Services Association) (Shaw, 2017).

- **Press**

The press includes magazines, journals, Internet news, television news, and other means of mass communication. Articles on music and the arts can be written by a writer or a public relations agency and broadcast on radio and television, as well as in newspapers. This is an excellent way to promote music, but they will require a deep understanding of the genre as well as contextual knowledge to report authoritatively about current and upcoming musicians and events (Shaw, 2017).

- **Radio and Television**

Radio and television stations also incorporate music into their programming. They are important for increasing exposure and raising awareness. To attract exposure, music videos are made with the intention of being shown on television. Artist interviews and documentaries are also used to promote music (Steyn, 2005).

2.8.5. Facilitators

Facilitators, according to Shaw (2017), are organisations that provide a forum for different clusters of members' interests, such as education, networking, negotiating, royalty collection, and lobbying. They are companies that help the industry's other big players g*et al*ong. They frequently have a common voice for their participants, and since the facilitators' roles overlap, they can be found in all clusters. Government agencies, in addition to these cluster-specific alliances, are included in the facilitation community.

The Department of Arts and Culture of the South African government has been very involved in the music industry and has been behind many initiatives. The National Arts Council, as well as the provincial arts councils and commissions that finance several projects, have done the same. The Department of Trade and Industry is also working on incentive schemes for the

music industry. Business and Arts South Africa (BASA) is a non-profit organisation that promotes music industry campaigns outside of government. The Cultural and Creative Industries Federation of South Africa (CCIFSA) is a non-governmental organisation that aims to unite and lobby on behalf of the creative industries in South Africa. It was established in 2014 (Shaw, 2017).

Industry governing bodies

Several bodies are responsible for the production and security of the South African music industry's rights, according to Shaw (2017). The following are the main organisations that look after the needs of the local industry and its players:

- **Recording Industry of South Africa (RiSA)**

The Recording Industry Association of South Africa (RiSA) is a trade association that represents record labels and keeps track of their sales. They impose a levy on product produce on their participants, which is used to combat piracy in South Africa, among other items. RiSA has an ethics code that its members must follow and has helped to reduce corrupt activities and ensure contract accounting fairness. The agency has successfully protected the artist (Steyn, 2005).

According to a statement on their website, RiSA is "committed to improving the state of the South African music industry and promoting and safeguarding the interests of all member record companies, regardless of size" (RiSA). RiSA also manages South Africa's official anti-piracy campaign and the annual South African Music Awards

- **International Federation of the Phonographic Industry (IFPI)**

The IFPI is a multinational organisation with existing recording labels and regional organisations including RiSA as members. Both of South Africa's main record labels are affiliates of the IFPI, which promotes the importance of recorded music by working to extend its market applications and protects record producers. Anti-piracy, political advocacy, legal tactics, lawsuits, and public relations are among its services. The IFPI creates international standard recording codes, which are distributed locally by RiSA (Shaw, 2017).

- **Composers Association of South Africa (CASA)**

CASA is a non-profit organisation that offers important resources to composers, discusses problems and questions raised by songwriters, and provides an open platform for the sharing of ideas. With good technical and legal partnerships, CASA promotes composition publishing

and partnership growth. It serves as a conduit for composers to connect with other music industry bodies both globally and internationally (Shaw, 2017).

- **Musicians Association of South Africa (MASA)**

MASA has been working to improve the educational standards of musicians in South Africa since 2012. MASA wants equality, justice, and music industry agreements, as well as networking and defining music as a formal occupation in South Africa and is driven by a group of musicians (Shaw, 2017).

- **Music Publishers Association of South Africa (MPASA)**

Previously the National Organisation for Reproduction Rights in (NORM), the MPASA looks out for the interests of music publishers (Shaw, 2017).

- **Independent Communications Authority of South Africa (ICASA)**

ICASA regulates the telecommunications and broadcasting industries via four statutes: ICASA Act of 2000, Independent Broadcasting Act of 1993, Broadcasting Act of 1999, and Telecommunications Act No. 103 of 1996. It makes the regulations and policies that govern these industries and issues licenses to them. ICASA protects consumers from unfair business practices, poor service and harmful or inferior products (Shaw, 2017).

- **National Association of Broadcasters of South Africa (NAB)**

NAB is an Association for radio and television broadcasters. It serves audiences and contributes to development and diversity in broadcasting. It works with policymakers on behalf of its members and then advises them. It makes submissions on bills, amendments, and discussion papers. NAB also provides royalty negotiations and legal and regulatory advice for its members (Shaw, 2017).

- **South African Revenue Service (SARS)**

Shaw (2017) reminds those working in the music industry that their royalties as well as revenue from live performances are taxable. The income made from the sale of music product is also taxable.

- **South African Roadies Association (SARA)**

SARA is primarily a training institute which educates youth and technical and production fields. It was established in 1992 and provides an exchange program for overseas training of their members (Shaw, 2017).

Collective management organisations

- **RiSA Audio Visual (RAV)**

RAV has evolved into a full-fledged licensing program for the use of RiSA members' music videos. Broadcasters, programmers, and video jukebox machine manufacturers are common users. RAV manages the output rights to videos as well as the rights to copy (dub) videos into productions, with a repertoire of almost 10,000 videos. Notifications of videograms to RAV can be made electronically or by filling out the appropriate form after joining RiSA (Steyn, 2005).

- **International Confederation of Societies of Authors and Composers (CISAC)**

Over 200 royalty collection societies are members of CISAC, which has its global headquarters in France. Its steadfast mission is to unite writers and composers all over the world to secure their interests as artists. Its responsibilities include organising and strengthening the efforts of collecting societies around the world, as well as reforming Copyright legislation. In Johannesburg, the CSAC has a regional branch (Shaw, 2017).

- **Societies Council for Collective Management of Performance Rights (SCAPR)**

SCAPR, based in Brussels, was established in 1986 with the goal of fostering mutual partnerships between performer rights organisations. SCAPR, like CISAC, aims to strengthen international knowledge flow as well as bilateral agreements between those organisations. SCAPR maintains an international performance archive which assigns international artist numbers to keep track of facts about performers (Shaw, 2017).

- **South African Music Rights Organisation (SAMRO)**

SAMRO is South Africa's performing rights organisation. It manages and receives royalties for writers and publishers of compositions in the realms of South Africa, Botswana, and the kingdoms of Lesotho and Swaziland. It makes separate payments to the composer and publisher. Performance royalties are covered by some bro through television and radio transmission, public performances, video synchronisation, and works in a diffusion service. SAMRO is notified of a song using a "notification of works" form. You do not become a member unless you have been a member for almost two years and have fulfilled those criteria. SAMRO is a CISAC alum and a new SCAPR affiliate member (Shaw, 2017).

SAMRO is the largest of the copyright organisations and it controls all broadcasting and public performing rights in South Africa (Steyn, 2005).

- **Association of Independent Record Companies of South Africa (AIRCO)**

AIRCO works to meet the needs of independent record labels by lobbying the government, supplying information, growing their members' market share, and enhancing the cultural diversity and exposure of recording artists, among other things. Music video royalties are also collected by AIRCO (Shaw, 2017).

- **Composers, Authors, and Publishers Association (CAPASSO)**

CAPASSO is the mechanical right society in South Africa. It administers mechanical rights and grants licenses to users and copyrighted works often in categories of commercial head and production music (general purpose music such as background music).

- **South African Music Performance Rights Association (SAMPRA)**

SAMPRA is a non-profit organisation that grants licenses and collects fees on behalf of its members for the transmission of sound recordings, also known as needle time. SAMPRA will also licence sound recording copies to broadcasters for use in uploading songs to services for success voting (Steyn, 2005). SAMPRA is divided into two sections: one for live performances and the other for recording studios. The performance chamber is managed by the Performance Organisation of South Africa (POSA) trust. The POSA trust was established to oversee SAMRO's success share of needle time writes (Shaw, 2017).

Education and development

According to Shaw (2017), there are three tiers of education in the music industry. Musicology is the scholarly and scientific study of music, while ethnomusicology is the study of music in relation to history and society. Professional music industry training, which includes sound engineering, video editing, photography, and instrument manufacturing and repair, is the second choice. Finally, until recently, the commercial side of the companies was widely neglected. While the music and technology industries in South Africa are well-known, the business side has been largely overlooked until recently. In this area, the following are facilitators of concern (Shaw, 2017):

- **Music is a Great Investment (MIAGI)**

MIAGI focuses on human capital development to promote social upliftment in South Africa. Its programs include music, education, music partnership, and showcases.

- **South African Society of Music Teachers (SASMT)**

The SASMT is a non-profit organisation and was established in 1919. It administers several music scholarships and bursaries for music study and provides benefits to handicap members. That also provides listing listings of teachers in there by unusual magazine and website. It holds up biennial conference for its members.

- **Vusi Mahlasela Music Development Foundation (VMMDF)**

The VMMDF charity concerns itself with promoting and conserving indigenous African music and audits diversity. It operates from a school called Vusi Mahlasela Music Academy.

2.9. Preliminary Conceptual Framework

A conceptual framework is provided to guide data collection and analysis. The conceptual framework specifies who and what will be studied. Figure 2.24 is a preliminary attempt at listing the influences and players in the music industry's supply chain.

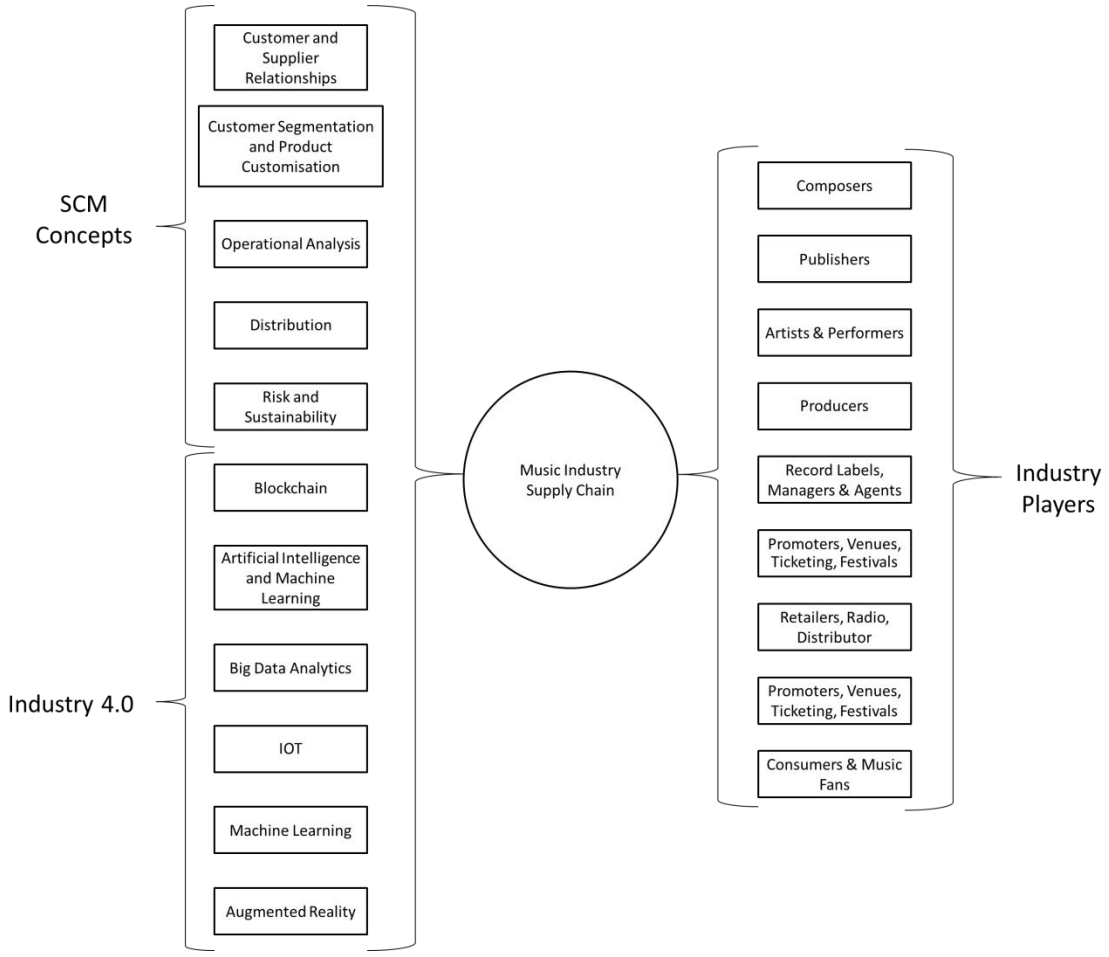


Figure 2.24: Preliminary conceptual framework for the music industry and the influences on its supply chain.

The illustration in the Figure 2.24 identifies the people and the variables the researcher has identified as influential on the supply chain of music. Miles *et al.* (2014), describe a preliminary conceptual framework as the current version as the researcher's guide to the topic being investigated. As the researcher's knowledge of the topic improves, the conceptual evolves as the study progresses.

2.10. Summary

This chapter focused on understanding the traditional music industry supply chain and how the technological advancements have affected the structure of the supply chain's activities, players, governing mechanism, and its coordinating structure. Literature covering the Fourth Industrial Revolution and the South African Music Industry was also reviewed in the chapter. The methodology used in the research will be outlined in detail in the following chapter.

CHAPTER 3. RESEARCH METHOD

This chapter offers a detailed overview of the study's research methodology. According to Wahyuni (2012), research entails the systematic, supervised, and rigorous exploration and explanation of what is unknown, as well as the establishment of associations and causations that allow for the accurate prediction of outcomes under specific conditions. According to Bougie (2009), research is a systematic and organised effort to investigate a specific problem for which a solution is required. This chapter covers the research design, the study's purpose, the sampling techniques, the target population, the type of sample and sample size, the testing instruments used in the study, data collection methods, and data analysis methods.

3.1. Research Design

The research studies the South African music industry, and its main aim is to understand the impact new technologies have had on the supply chain for music. Since this is a focus on investigating occurrences within a real-life context, an explorative qualitative approach was chosen to answer the research questions posed (Yin, 2009). Yin (2009) argues that a qualitative approach is preferred when “how” or “why” questions are being asked. This study explores how emerging developments are affecting the music industry’s supply chain and how the industry is responding to these changes.

Cooper *et al*. (2014) define exploratory research as a study conducted when there is a lack of knowledge or research on previously addressed problems or research topics. To learn more about the South African music industry, this research design was chosen. Given the lack of empirical and theoretical research on the South African music market, an exploratory design approach was appropriate. As a result, the researcher can draw conclusions and make recommendations.

3.1.1. Data collection

Wahyuni (2012) classifies two types of data to be collected, namely primary data and secondary data which was outlined in Chapter 2.

Primary data collection

The primary data was collected first-hand using semi-structured interviews with participants from organisations that are related to the study. These interviews were employed to obtain a perspective of the networks and business model types of the different industry participants. This was an appropriate method for determining the future state of the industry's supply chain from the perspective of the players because it allows for the collection of detailed information

in an exploratory manner. According to Wahyuni (2012) semi-structured interviews are usually chosen because they encourage two-way communication and can confirm what is already known to the researcher and provide opportunities for learning. Wahyuni (2012) further states that, interviews also encourage the respondent to relate experiences and perspectives that are relevant to their problems of interest.

Wengraf (2001) states that lightly structured interviews are also appropriate for testing highly developed theories, most especially when those theories require data that a heavily structured interview schedule discourages. He further states that research questions need to be differentiated from any interview questions that might be used. The general rule is that theory or research questions are not interview questions, the research questions govern the production of the interview questions (Wengraf, 2001).

Wengraf (2001) outlines an algorithm which can be used when designing and analysing interview material shown in the Figure 3.1 below. The algorithm is based on the primary research question and on the distinction between theory-language used in research questions and the interview-language to be used in interviews.

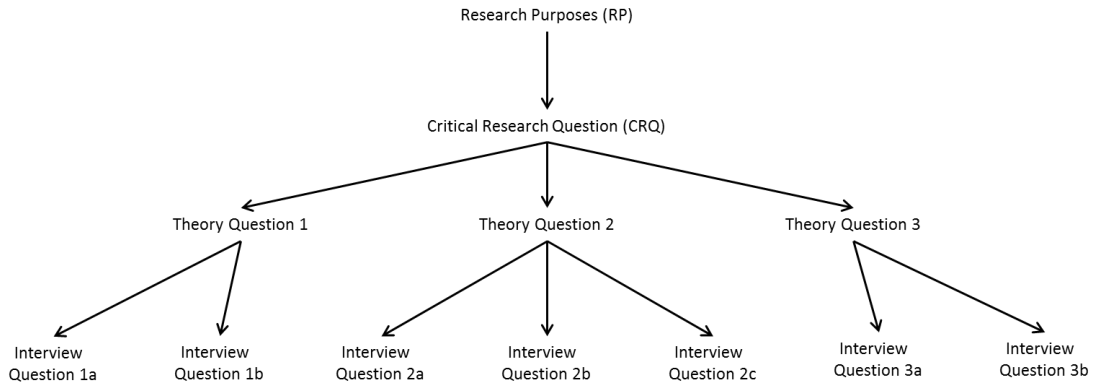


Figure 3.1. CRQ - TQ - IQ: Pyramid Model (Wengraf, 2001)

To structure the interview, open ended questions were developed and administered, using the algorithm in Figure 3.1. The list of questions to guide the interview process can be seen in Appendix B. Participants were given a brief explanation of the intent of the interview and the essence of the questions before the interview, to ensure a certain degree of preparation, and were debriefed afterwards. Prior to obtaining some information from the individuals, a letter of participation was sent to each of them (see Appendix A). Prior to the interviews, the individual signed a consent document.

Twelve semi-structured interviews were conducted. Due to timing issues and the COVID-19 pandemic, the interviews were conducted over the Internet using Microsoft Teams and Skype videoconferencing platforms. The interviews were recorded in such a way that all the dimensions of the speech were registered, as recommended by the literature. All the interviews followed the same format, which was built on the same structure with some changes to arrangement or order of questioning depending on the conversation flow and the status of the participant.

Since the interviews were designed as semi-structured and semi-guided, each interview was approached more as a conversation rather than a questionnaire. All the interviews were started with a brief introduction; explaining the reason for the interview and asking the participants to provide a brief background of themselves, their work, roles, and responsibilities. An information sheet which requested each participant to provide their personal information was delivered in the format below:

- Age
- Gender
- Race
- Highest level of education
- Participant Category: whether the participant belonged to a major or was independent.
- Number of years in the music Industry
- Professional status

It was found that all these characteristics may at times emerge or be elicited by the interviewer in the conversation itself. This was found to be best, as some of the questions were thought to be delicate to ask directly.

Broad points which were also discussed included exploration of participants' prior understanding of Industry 4.0 technology, their experiences in the industry, their operational environments, and their strategies and outlook of the future. The points below are a broad outline of the schedule the researcher followed when conducting the semi-structured interviews.

- Explore participants understanding of Industry 4.0
- Explore participants experience with the analogue to digital music transition; compare.
- Ask about the environment in which the participant operates.
- Explore thoughts on the Major labels' control over the supply chain, description, and feelings.
- Explore thoughts on technology companies creating more value than incumbents in the supply chain, even though music is not their core competency.
- Use participants experience to ascertain their recommendations for the payment of royalties and facilitation.

The semi-structured nature of the interviews allowed for more questioning and digression from the main topics while also allowing for exploration of the given answers. These topics and questions arose from the secondary data collected by the researcher as outlined in Chapter 2.

Secondary data collection

The second type of data, secondary data, refers to information that is obtained from sources that already exist (Cooper *et al.*, 2014). As can be seen in Chapter 2 of this study, data was gathered from the literature and the previous works of other scholars. Textbooks, journals, records from public agencies or phonographic societies, and the Internet were gathered as secondary data for this research in the form of a literature review.

3.1.2. Sample selection

Target population

In this research study the sample targeted is comprised of participants from record companies.

In Johannesburg, the "big three" record labels have a headquarters or at least a main subsidiary. This city was chosen as a symbol of the music industry to draw broad conclusions. Participants in the interviews who worked for one of the "Big Three" were targeted. Participants from independent record labels that have entrepreneurial backgrounds were also sought out, as these participants are assumed to be innovative because of their entrepreneurial nature.

Sampling technique

Snowball sampling is a widely used tool in qualitative analysis, according to Cooper *et al*. (2014). Cooper *et al*. (2014) further states that, snowball sampling is a good option especially when it is difficult to find the desired number of interviewees or when the respondents are hesitant to participate in a study. To find respondents, this strategy employs a referral approach: people from the target population were asked to provide information on how to locate other members of that population they know. As a result, the respondents assisted in identifying colleagues, acquaintances, or friends. A total of twelve (n=12) participants were interviewed in the study. Like a snowball grows as it accumulates snow, so does this sampling technique as it gathers respondents for the purpose of this exploratory research.

Table 3.1 shows the main characteristics of the participants interviewed in the study.

Table 3.1. Main characteristics of the participants interviewed in the study.

Status	Particpant Category	Age	Education	Years in industry	Interview Method	Duration	Code
Artist	Major	27	Honours	10 +	Interview conducted via videoconferencing	1h5min	P1
Artist	Independent	23	Matric	4-6	Interview conducted via videoconferencing	40min	P2
Director of Indie-label	Independent	38	Honours	10 +	Interview conducted via videoconferencing	1h6min	P3
Music Technology Entrepreneur	Other	26	Bachelors	7-10	Interview conducted via videoconferencing	55min	P4
President of Indie-label	Independent	37	Honours	10 +	Interview conducted via videoconferencing	59min	P5
Radio Station Founder/Owner	Independent	30	Bachelors	10 +	Interview conducted via videoconferencing	49min	P6
Record Producer/Author	Independent	37	Honours	10 +	Interview conducted via videoconferencing	1h18min	P7
Studio Founder/Owner	Independent	37	Bachelors	10 +	Interview conducted via videoconferencing	47min	P8
Studio Manager	Major	32	Honours	7-10	Interview conducted via videoconferencing	1h24min	P9
Studio Manager	Major	30	Honours	7-10	Interview conducted via videoconferencing	1h11min	P10
Studio Manager	Independent	29	Matric	10 +	Interview conducted via videoconferencing	1h10min	P11
Supply Chain Business Consultant	Major	52	Honours	10 +	Interview conducted via videoconferencing	1h40min	P12

3.1.3. Data analysis

Data preparation

Boeije (2009) asserts that raw data, which in this case will be in the format of voice recordings and shorthand notes from the interviews, needs to be managed so that they are ready to be analysed. Data management of the research involved three aspects (Boeije, 2009):

- Data Storage

Good data storage was one that enabled easy retrieval of data. The audio recordings, video recordings, and transcribed shorthand notes were stored on the researcher's password-protected computer. Here the data was further categorised based on their relevant use in the analysis step.

- Transcribing interview audio and video recordings

Interviews lasted between 40 and 90 minutes and were captured on an encrypted computer. Following that, the researcher transcribed the recordings into Microsoft Word documents (See Appendix D), double-checking for accuracy and ensuring that the transcripts were anonymous.

- Cleaning the data

Considering the ethical concerns about anonymity and confidentiality, all information that could be used to identify the participants and the organisations that they represent were omitted (Boeije, 2009). The data was identified by a specific coding, e.g., Participant 1 and Company 1, to the information provided by P1 and C1, respectively.

Qualitative data analysis

The data was subjected to a qualitative thematic analysis, which involved identifying patterns and themes (Wahyuni, 2012). Data analysis on qualitative data entails dismantling, segmenting, and reassembling data to produce meaningful findings from which inferences can be drawn (Boeije, 2009). The research questions guided the process of analysing the collected texts and logically combining them.

Seldana (2015) proposes coding as a method to analyse qualitative data. According to Seldana (2015), "in qualitative data analysis, a code is a researcher-generated concept that symbolises data and thus attributes interpreted meaning to each individual datum for later purposes of pattern detection, categorisation, assertion or proposition development, theory building, and other analytic processes." (p4)

Coding is an exploratory problem-solving technique without specific formulas or algorithms to follow (Seldana, 2015). Data can be separated, grouped, reorganised, and connected in a cyclical process to consolidate context and establish explanation. The propositional statements of the groups are then compared to one another to determine possible relationships, resulting in an outcome proposition based on their combination (Seldana, 2015). Codifying normally follows the ideal and simplified scheme shown in Figure 3.2 as a very simple operation.

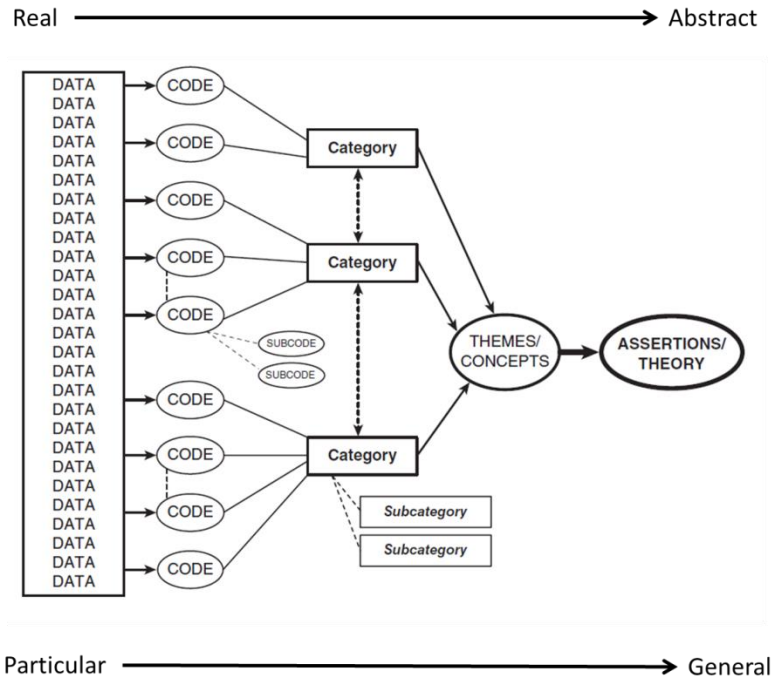


Figure 3.2. A streamlined codes-to-theory model for qualitative inquiry (Seldana, 2015)

When it comes to extracting themes from within texts, coding works in a similar way to thematic analysis. It provides a method for systematically identifying any differences in empirical data. As a result, the coding method is preferred to reveal important concepts, processes, and the respondents' overall professional experiences (Seldana, 2015).

The researcher and the assistant coded the transcribed interviews (See Appendix C). The process of transcribing the interviews was a long process, which occupied most of the time spent on the study. Each transcription process took between 3-5 days to complete. Once done, transcripts were read at least twice, with large notes taken on explanations and emotions that could lead to recurring themes and concepts. Colour coding was used to assess the frequency of language used and its relationship to other statements, as well as the language's relevance to the research goals. These patterns were considered once more before coming up with the themes.

Outliers were found to be just as reliable as majority views when the transcripts were analysed. Reflective discussion and self-analysis were used to consider data collection, perception, and the creation of themes. The trends that originated from the participants' accounts alone were identified, while acknowledging individual and collective biases and motives.

3.1.4. Reliability and validity

The research quality of qualitative research has been subject to many discussions in literature. Wahyuni (2012) states that qualitative research has in the past been criticised as lacking generalisability by the quantitative mainstream. Wahyuni (2012) further asserts that the quantitative tradition believes that research should rely heavily on reliability and validity to ensure repeatability and generalisability.

Yin (2009) describes reliability as referring to the consistency of measures and demonstrating that the operation of a study – such as the data collection procedures – can be repeated, with the same results. In addition to that, Golafshani (2003) declares that validity determines whether the research truly measures that which it intends to measure or how truthful the research results are. However, Wahyumi (2012) also argues that the traditional concepts of reliability and validity do not fit perfectly into the qualitative research paradigm, because qualitative research operates in a completely different domain with different missions and agendas to quantitative research. Qualitative research seeks to produce credible knowledge of interpretations on organisation, management processes and understanding, with an emphasis more on context (Wahyumi, 2012). Other authors cited by Golafshani (2003) assert that the question of repeatability in the results of qualitative studies is not as important as the precision, credibility, and transferability of the study, which provide a better way of evaluating the findings of a qualitative research. From this, it is determined that, because the two research approaches and perspectives are essentially different, the criteria to be used to assess the quality of a qualitative study should also be different.

Alternative terms were introduced by Lincoln *et al*. (1985) to make reliability and validity more responsive to the unique nature of qualitative study. The following are the research trustworthiness parameters established to assess the quality of qualitative research:

- Credibility, which deals with the accuracy of data to reflect the observed social phenomena. Data triangulation and method triangulation approaches enhance the credibility of research findings.
- Reliability encourages repeatability, so dependability refers to that definition. Increasing dependability can be accomplished by including a thorough step-by-step description of the study process as well as the key tools used to collect analytical data, such as a list of interview questions.

Now that the concepts of reliability and validity have been redefined for the purpose of this study, the methods and criteria identified will be used to maximise the quality of the research.

3.2. Limitations of the Study

- Small number of observations

The size of the study, in which twelve participants were interviewed throughout the Johannesburg region, limited, and narrowed the scope of the research. A larger data pool of players would have allowed a broader scope and an acceptable level of data saturation.

- Selection Bias

Most of the people who accepted the interview were interested because they are Industry 4.0 evangelists. Therefore, the process of selecting the participants would yield bias results. The people interviewed already believed the claims that Industry 4.0 technology would eventually change the industry and were more likely to agree with the statement and contribute examples that confirm this.

- Inaccuracy

The viewpoints and comments of the participants are skewed by their relative role and status in the industry. Anecdotes are personal accounts that are often misremembered, misinterpreted, incorrectly repeated, and so on. Reflectivity, through which the researcher's and social environment's effect on each of the participants is recognised and controlled, is used to maximise the credibility and dependability of the results while minimising any inaccuracies. It was taken care not to sway participants' opinions in favour of or against the study's goal.

3.3. Ethical Issues

Ethical clearance was obtained from the School of Mechanical, Aeronautical and Industrial Engineering’s Ethics Committee before data collection proceeded. The ethics clearance number for this research report is MIAEC 113/20. Throughout the research review, the researcher maintained objectivity, fairness, and impartiality. Both interviewees were assured of their privacy and that the information they provided would be kept private. They were also told that they had the option of opting out of the study. This safeguards the respondents while also enhancing the research's credibility. The participants were given consent forms that both the respondent and the researcher had to sign

3.4. Summary

The key issues of the research methodology and methods used in the study were discussed in this chapter. The general research methods were examined first, accompanied by an examination of the methodology instruments used in the analysis. The section looked at the interview tool as well as the methods used to analyse it. The previous chapters, as well as this one, centred on clarifying the research context, theoretical foundation, and methodology. The findings of the analysis will be presented and discussed in the following paragraphs, which will contribute to the formulation of the paper's discussion and conclusions.

CHAPTER 4. FINDINGS AND ANALYSIS

This chapter addresses the findings that the researcher obtained while conducting the study described in Chapter 3. The interview responses were analysed, accompanied by a synthesis of the previously examined literature and the conclusions from the interviews.

4.1. Profile of Respondents

The demographic information on the respondents will give the reader of this study an idea of the sample group's age, ability, and experience. This knowledge is essential to this study because it puts the data into context. The demographic details of the participants are summarised in this section. Twelve interviews took place, with participants having; Executive (n = 2), Manager (n = 3), Entrepreneur (n = 5), and Artist (n = 2) professional status, see Table 4.1.

Given the nature of music industry supply chain, it was determined that all participants could give accounts that can provide insights into the current challenges and possible future changes in the supply chain.

- Age

The importance of the sample group's age revealed the longevity of a career in music. Table 4.1 and Figure 4.1 summarises the age demographics of the participants. Age was also a factor in determining how long someone had worked in the music industry. The wide age range represented a diverse range of viewpoints obtained from the interviews.

Table 4.1. Age composition of participant sample.

Age	Freq.
18 - 25 years	1
26 - 35 years	6
36 - 45 years	4
46 years and older	1

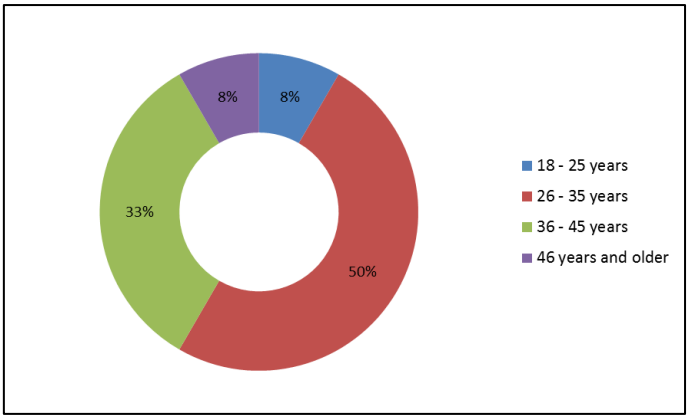


Figure 4.1. Age distribution of participant sample

- Experience

The range of experience was vast between the interview participants. Table 4.2 and Figure 4.2 summarises the range in experience of the participants in the industry. Among the interview respondents, 64% had been in the music industry for more than 10 years. The group's experience ranged from 5-30 years of experience in the music industry.

Table 4.2. Experience composition of participant sample.

Years in the industry	Freq.
1 - 3 years	0
4 -6 years	1
7 -10 years	3
Over 10 years	8

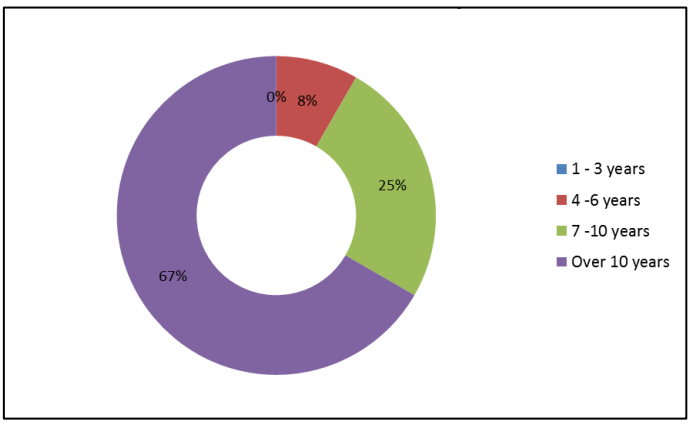


Figure 4.2. Experience distribution of participant group.

This meant that there was potential for a long-term career in the local music scene. Many of the respondents in this study had a wealth of knowledge from which to draw conclusions.

- Education

A question was posed to the participants about their education and technical capabilities. Table 4.3 and Figure 4.3 summarises the education level of the participants interviewed. This demographic detail was important because a formal education means that participants may have learned the theoretical aspects of the industry and might impart opinions that contrast theory and practice.

Table 4.3. Education level composition of participant sample

Level of Education	Freq.
High School	0
Matric	2
Bachelor's Degree	3
Honours	7
Masters	0
PhD	0
Other	0

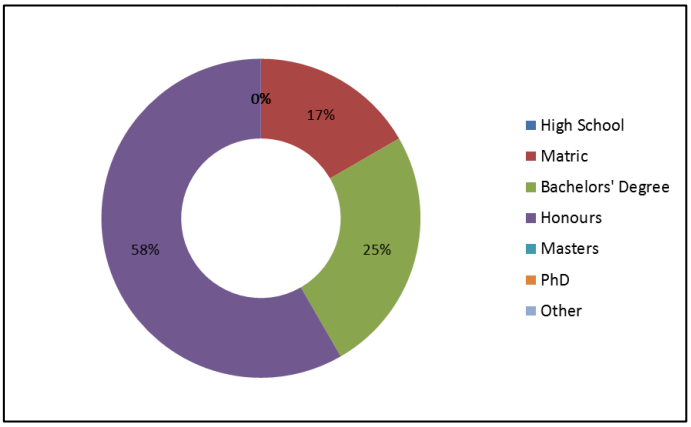


Figure 4.3. Education level distribution of participant sample

- Professional status and category

About 91% of the respondents said they charged for their services. This meant that the industry was experiencing healthy trade and skilled activity.

Various questions were asked of the artist participants to determine if they worked professionally or part-time or as a hobby. This was significant because this study is focused on an understanding of the music supply chain, and money is one of the most important

resources that flows across supply chains. Table 4.4 and Figure 4.4 summarises the professional status of the participants, as can be seen below.

Table 4.4. Professional status composition of participant sample.

Professional Status	Freq.
Artist	2
Entrepreneur	5
Manager	3
Executive	2

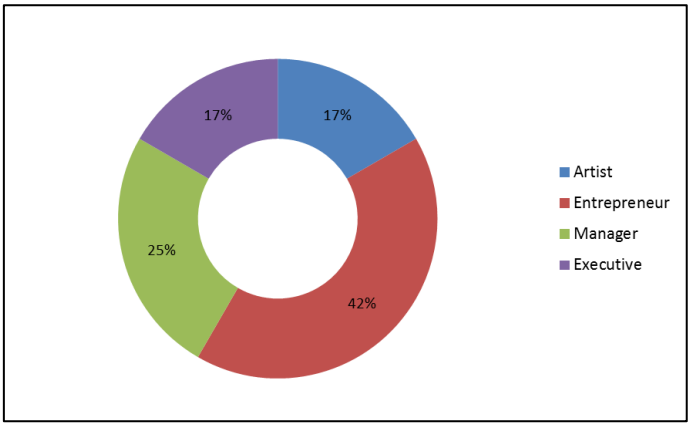


Figure 4.4. Professional status of participant sample

Part-time artists made up 9% of the participants. The segment had previously been full-time artists who had become part-time artists due to a lifestyle change. In addition to the professional status of the participants, another demographic was whether the participants were part of a major or independent label. As can be seen in Table 4.5 and Figure 4.5, 33% of the participants either belonged to or were under the employ of a major label, while 58% were part of independent labels. One of the participants was a software engineer for a company which specialises in creating applications for the music industry; this segment formed 8% of the participants.

Table 4.5. Category composition of participant group.

Category	**Freq.**
Belongs to a major label	4
Independent	7
Other	1

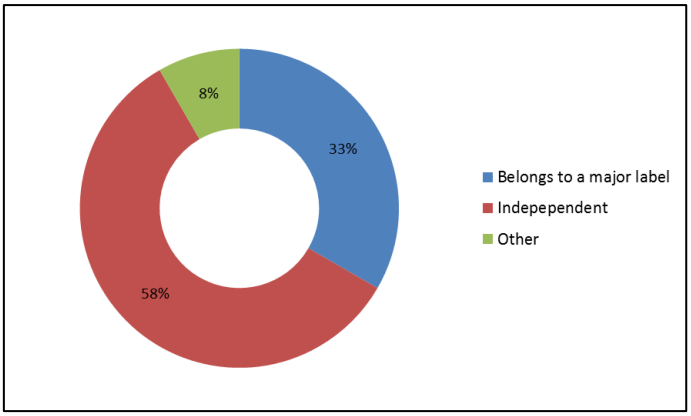


Figure 4.5. Category distribution of participant group.

4.2. Interview Analysis: An Insider's View

Twelve people were interviewed as part of the analysis to get a more informative and reliable picture of the South African music industry. Individuals under the employ of one of the five major record labels, as well as participants from independent record labels with entrepreneurial backgrounds were chosen. The participants were chosen to represent a sample of professional music businesses.

As a result, according to their opinions, the group's views and comments are biased in relation to their relative role and status in the industry. Each participant was asked to answer several questions about their experience and value network on their own. The information provided here is based on aggregate responses, the calculations of which can be seen as part of Appendix D.

The benefit of conducting thematic analysis on the data collected from interviews is that it helped to establish specific themes in order to highlight the study's main issues. Six themes were articulated from the participants because of coding the interview transcriptions (see sample transcriptions in Appendix C). The themes were:

- Important roles in the industry
- Technology makes independent music and entrepreneurship viable
- Increasing bargaining power of technology companies
- The challenges of and need for transparency
- The understated importance of Piracy and File-Sharing
- The fragility of the Majors

These themes are elaborated on in the following sub-sections.

4.2.1. The significant roles in the industry

As shown in Figure 4.6, when asked how vital the various players and/or services were to the operation and development of their companies over the previous five to ten years, the most significant stakeholders (chosen from a closed list of options) were Streaming Services.

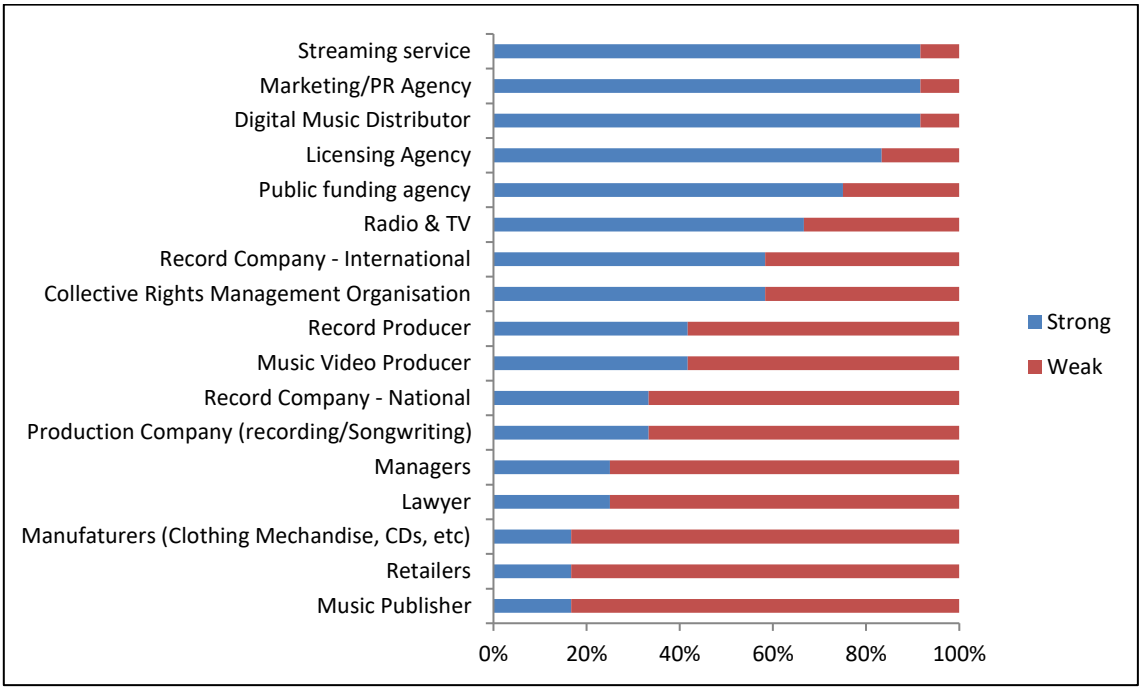


Figure 4.6. Relevance to the operation of participants in the past 5-10 years

This was not surprising given their success in South Africa and around the world. Following streaming services, are marketing and public relations agencies, and digital music distributors, which is closely linked to streaming services, were also considered relevant by the participants as one of the participants explained:

"…considering the popularity of social media. Businesses and people alike; celebrities, influencers etc., are always looking for a way to increase their visibility on social media, gain followers and engage their fan base. We use a specialist to manage our marketing, that's part of our strategy. The marketing people understand better how to generate interest and engage the fans." (Interview: P8)

According to the participants (see Figure 4.6), Music Publishers, Retailers, and Manufacturers were the least significant. This was unsurprising, considering that music stores are on the decline and on the verge of going out of business indefinitely (Phillip, 2021). When questioned about the decline of physical music retail stores, the following were typical comments:

"...people just do not buy CDs anymore; I haven't seen a CD player in years. Today, I cannot imagine where I would go if I wanted to buy a CD. Maybe I can search on the internet, but those things are obsolete now and so is that (music retail store) business model." (Interview, P4)

"Those (retail stores) were cool, I used to spend hours in the stores, browsing until I found something I liked, but I haven't bought any music like that in a long time. Do they (music retail store) even still exist?" (Interview, P1)

National record labels were also thought unimportant, highlighting one of the music industry's shortcomings in South Africa, namely the major record labels and their interests' dominance at the expense of smaller local players.

When asked the stakeholders they currently engage with the most, marketing plays a significant role in the day-to-day operations of music industry stakeholders, as can be seen on Figure 4.7, with Digital Distributors and Public Funding Agencies being the most frequently mentioned.

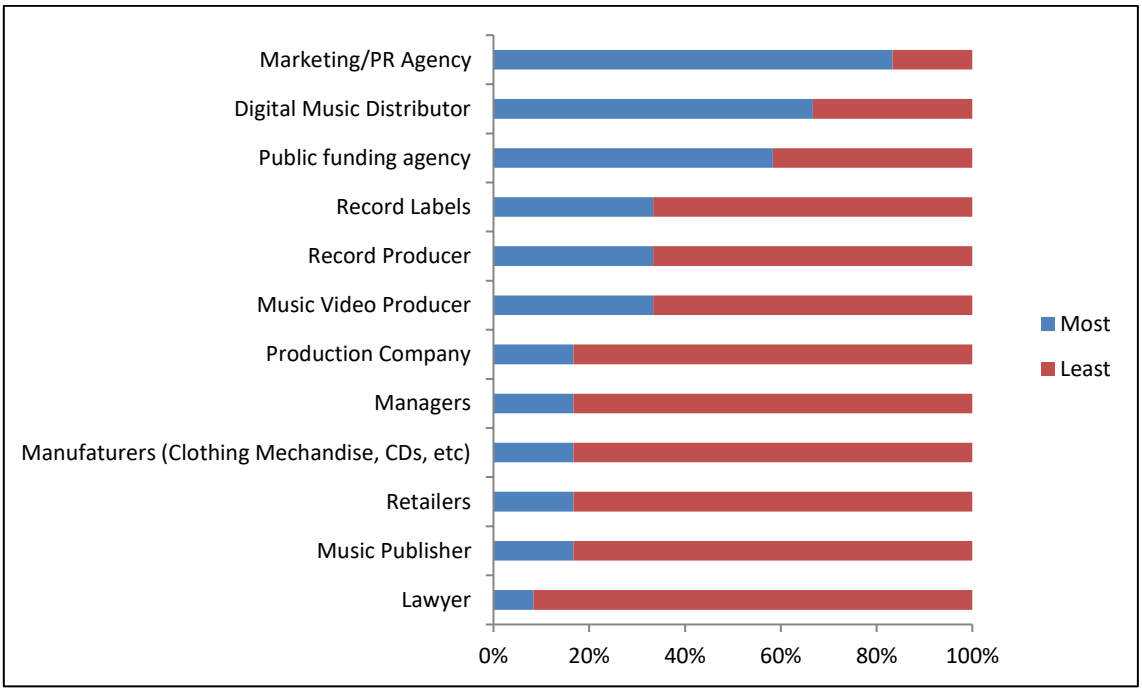


Figure 4.7. Stakeholder's current interaction.

Given the value of public funding agencies to the participants, it is possible that the processes for obtaining funds from public and government agencies are inefficient and bureaucratic, necessitating excessive contact.

This perspective does not alter much when respondents were asked about the stakeholders with whom they want to interact the most in the future, see Figure 4.8.

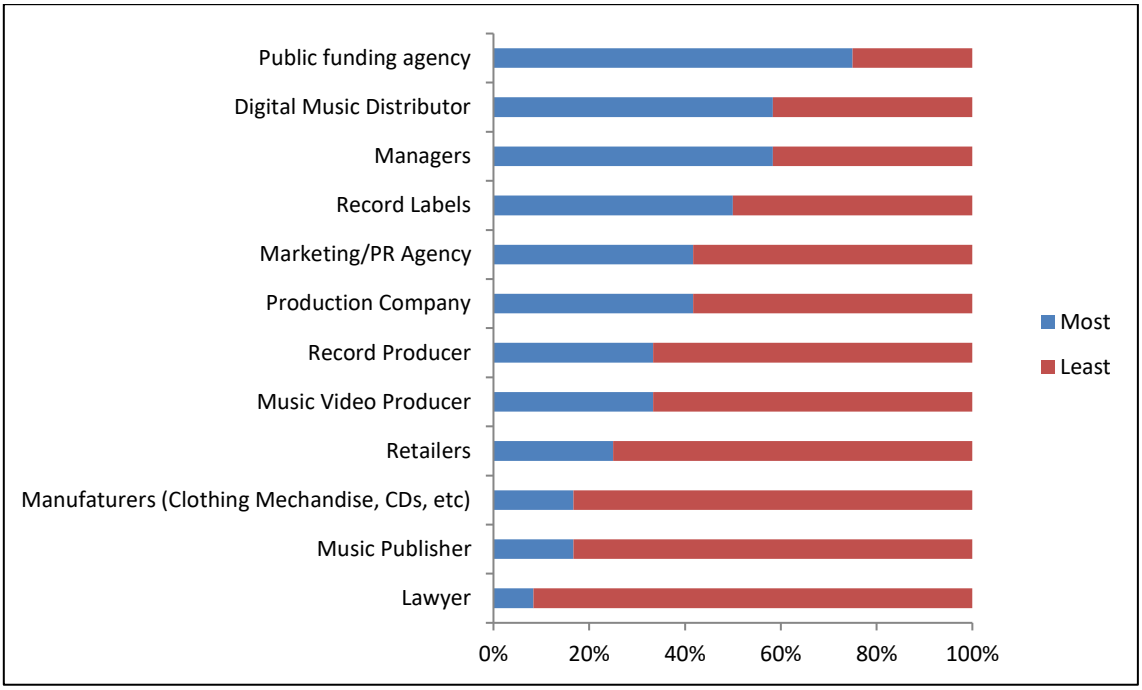


Figure 4.8. Stakeholder's future interaction

Nonetheless, partnerships with Managers are likely to be busier in the future. At the same time, and in what seems to be a contradiction given its relevance to the network, interactions with marketing agencies are likely to decline.

In an open-ended question, participants were also asked to identify sectors' according to their strengths and weaknesses, see Figure 4.9.

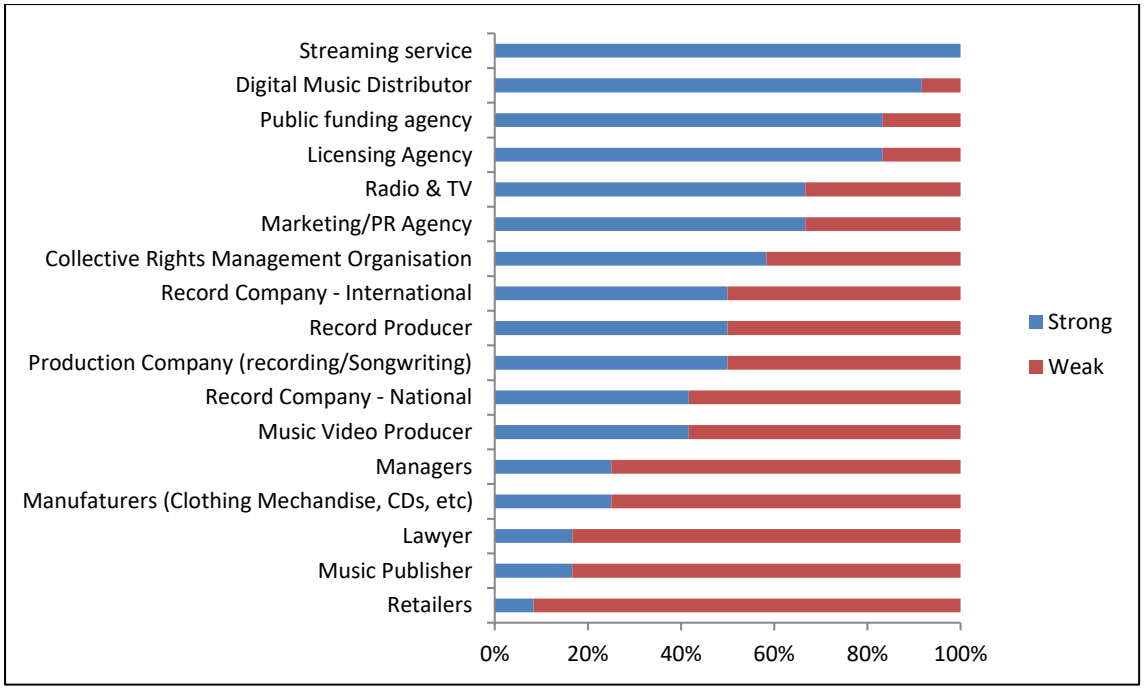


Figure 4.9. Strongest and weakest players in the South African music industry.

Participants seem to agree that financing is a major problem, with some calling for more private capital to come into the sector to help grow existing companies and create new ones. One of the participants commented on the South African music industry's weakness being:

> *"Weak knowledge and expertise in industry-specific business issues, as well as a lack of understanding that the music industry is about doing business, as well as a lack of sound financial advice and financing, are all major concerns for the overall growth of the South African music industry."* (Interview: P12)

Streaming Services (n = 12) and Digital Music Distributors (n = 11) are widely regarded as the industry's strongest players, as shown by their good success in recent years, according to the responses. Most respondents think highly of marketing/public relations companies, which speaks well of local businesses' advertising and outreach capabilities. In the other hand, public funding agencies have a negative reputation, which again speaks poorly of government policies.

4.2.2. Technology makes independent music and entrepreneurship viable

In today's age, the importance of independent music production has increased and is now a viable option for most artists in the industry. As this respondent explains,

"Before digital technology artists were independent by choice, because recording deals with major labels came with all sorts of terms and conditions, but now because there is so much content and artists out there, very few artists become signed to the majors so a majority end being independent anyway." (Interview, P3)

According to Hracs (2012), while musicians have always been able to make music on their own, the recording, manufacturing, marketing, and distribution of these songs required capital and skills that most individual musicians lacked. Also, basic recording and production, according to Hracs (2012), needed money and the services of specialised musicians. There were distribution agreements with major and independent labels, but the resources and technology needed to be self-sufficient in every aspect of the production and distribution process were not yet available. When the participants were asked, how simple it is today to record and distribute a song on a scale of 1-10 (where 1 is very easy and 10 is extremely difficult), the results were unsurprising (see Figure 4.10). All the participants (n = 12) agreed that it was very easy to produce and distribute a song, as this respondent explains,

"…anybody who owns a computer can become a musician now; it is no longer a specialised field of work where hundreds of thousands of Rands are invested in equipment alone. Sure there are people who still do that, but technology has made recording more affordable." (Interview, P12)

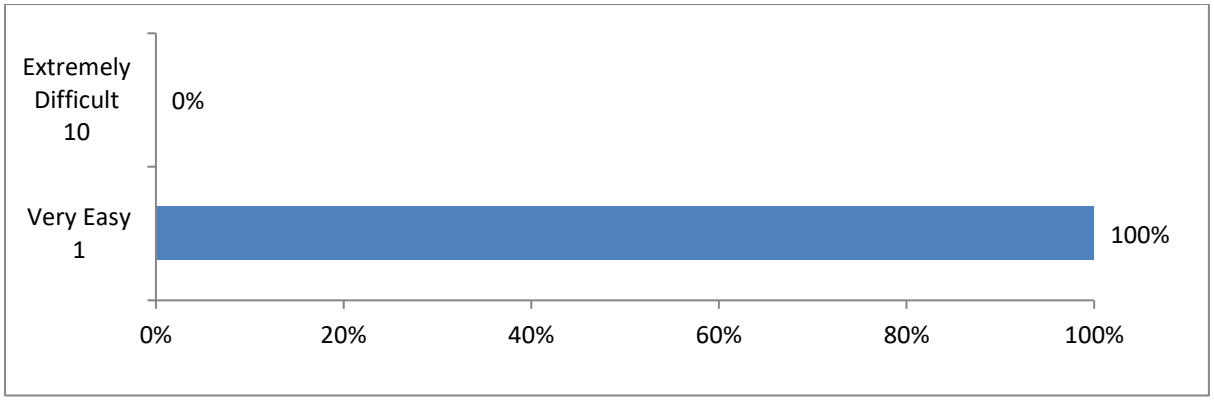


Figure 4.10. Difficulty to record and distribute music responses.

According to Hracs (2012), these advancements have not only removed the two traditional barriers of cost and skill, but they have also enabled musicians to market and distribute their music independently. Independent musicians are now expected to perform a wider range of tasks as the nature and work of independent music production has changed. As this respondent puts it,

"…because we run our own business, we are responsible for everything…as an independent artist you are the songwriter, the producer, you play the instrument, you are the manager, the marketing exec. Everything falls on you." (Intervew: P6)

Even though the repsonsibilities and amount of work seem to have increased. There is further evidence for the continued rise of independence, this lies in their ability to network outside of major labels influence. As these participants put it:

"…the internet has created a global community of artists and eased communications with people from across the world. I have collaborated on songs with people in Europe and North Africa, people I have never pysichaly met, people I have connceted with only through the use of social media. Social media tools like facebook and twitter have really simplified life for me as an artist. Now it is easier for me to access skills that I would have otherwise had to pay a lot of money for."(Interview: P2)

"…socal media has created a place where like minded individuals can connect and collaborate." (Interview: P8)

A question was posed to the participants about their footprint on social media platforms, from a set list of social media platforms, and all of the particpants (n = 12) had a social media account regitered on one platform or another, as can be seen in Figure 4.11.

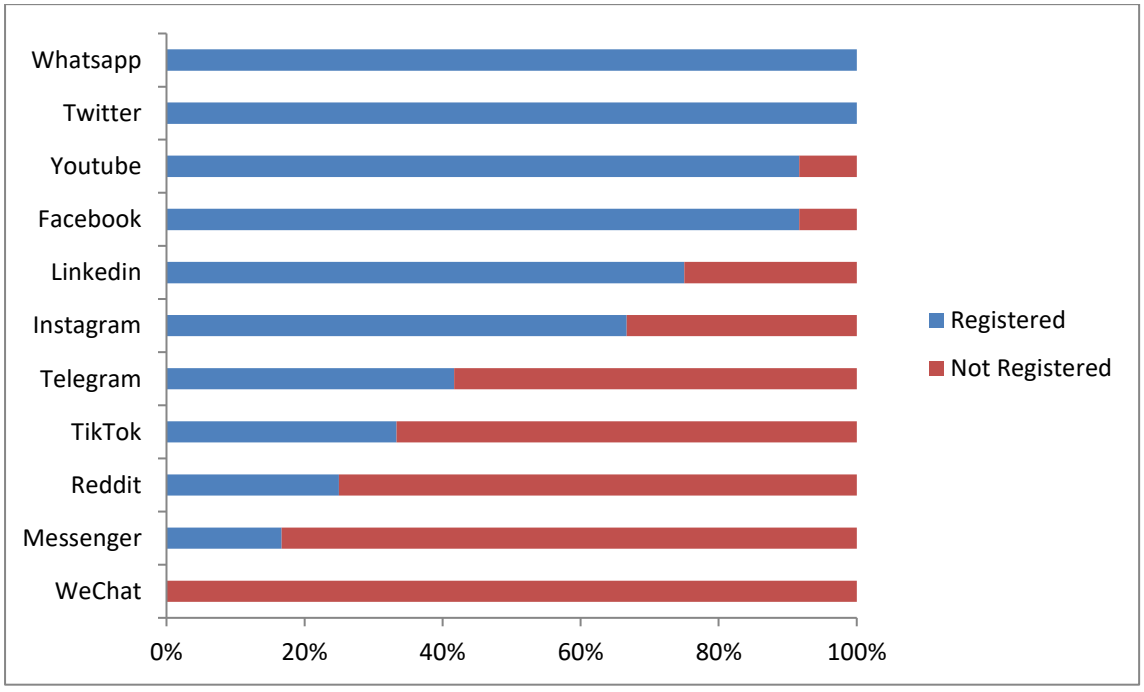


Figure 4.11. Social media footprint.

All of particiapnts had cellphone devices from which they use to communiacte with friends, collegues or family, which could explain why Whatsapp was ranked higher than any of the platforms. Twitter seemed to be the platform of choice amongst the participants, with all (n = 12) having an account registered on the platform.

A follow up question was posed on participants; they were then asked if any of the social media platfroms that they were registered on was used for sales, promotions or any other activity that directly relates to their business or function. The responses were summarised in Figure 4.12.

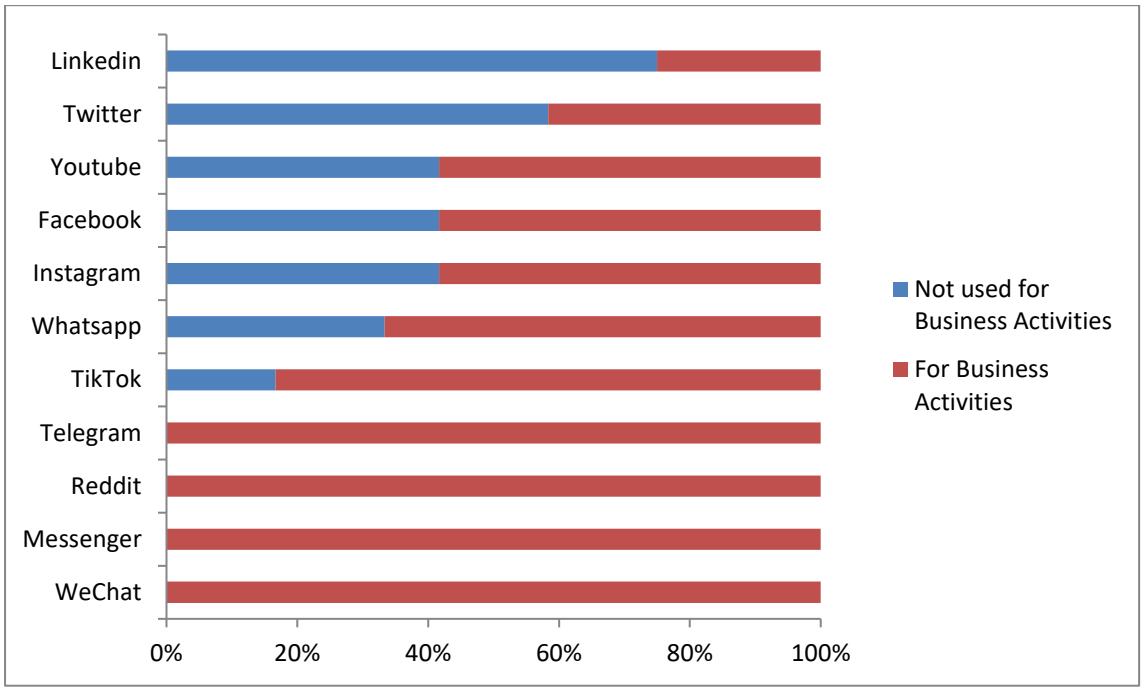


Figure 4.12. Social media platforms used for business activities.

Suprisingly only a 33% (n = 4) of the participants used Whatsapp for business, the rest indicated that the platform the mostly for personal use. Linkedin seemed to be the platform that the participants associated most with as their professional accounts, 75% (n = 9) of the respondents used Linkedin for business related activities.

According to Hracs (2012), contemporary independent musicians' working lives are shifting away from "artist" models of artistic development and toward a more professionalised entrepreneurial model. The transition from dependent to independent production necessitates a rethinking of the skills required for artistic creation. New skills are required as artists become entrepreneurs, and artistic or creative skills must be combined with those of a legal

expert, a financier, a manager, and so on (Hracs, 2012). As one respondent sums up their roles and responsilbilites:

"I am a manager, artist, accountant and marketer at the same time… Being independent is a full time job, the job does not only end when the music is finilised. I now have to find ways to market the music, look for gigs and find partners with which I can manufature the merchandise to compliment the music. It is not as easy as some people think." (Interview: P8)

4.2.3. The increasing bargaining power of technology companies

The International Federation of the Phonographic Industry (IFPI) described the value gap as the unequal return of revenues generated by the global explosion of music consumption to those who produce, own, and invest in music (IFPI, 2016). This was a reference to Internet intermediaries, who have become increasingly common in recent years because of their ability to use their bargaining power on the value network to access low-cost musical content (Ricardo, 2017). Although being the world's single largest source of recorded music, the IFPI was specifically targeting ad-supported services that rely on "user-uploaded content" and benefit from safe harbour protections. YouTube, the world's most popular (music) video streaming platform (Ricardo, 2017), has over 1 billion subscribers worldwide, with 82 percent of them using it for music (IFPI, 2016), but only paid out 4% of global industry revenues in 2015. When asked whether technology companies will have even greater influence in the future, all the participants agreed (n = 12), the following statements reflect many of the answers:

"Yes, definitely, the buzz words right now are streaming services and digital platforms. So, there is a future there for anyone directly or indirectly working with those services. They have taken over I tell you…" (Interview: P2)

"…it is crazy nowadays; I was sitting at home the other day and asked Siri (Apple's AI Assistant) to play me some music. It works! Making music enjoyment that much easier. So, I see a lot of things like that happening in the future, most definitely, change will be driven by tech companies." (Interview: P9)

"This is true of all businesses in all sectors all around the world. Your company might not be in the software business, but eventually a software company will be in your business. The world is influenced by technology and the music industry is no exception. It will continue to be like that for a long time to come." (Interview: P3)

"Not so long ago, MP3 players were in high demand, but now we have paid subscriptions to online streaming platforms on our cell phones, allowing us to access millions of songs. Technology companies are the innovators… they are here to stay." (Interview: P6)

A vertically-integrated supply chain, according to Tapscott (2000), is one in which the dominant force is normally the entity that connects the other companies to manufacture the final product. The corporation would also have leverage over the chain's main resources and value measures. Otherwise, in the absence of vertical integration, each company can operate independently of others, with only a limited relationship with them. When asked about the nature of future relationships between technology companies and music industry incumbents, most of the respondents (n = 11) agreed that business relationships would vary from close alliances to loose collaborations. The loose collaborations will be between new players that have not build a reputation for themselves yet but are providing a service that is deemed necessary at the time. The participants also agreed that the nature of the relationships could change from loose to close or the other way around, depending on market development. Long-term partnerships are also seen as a significant competitive advantage by the respondents (n = 12). The responses are summarised with the following statements:

"It makes sense for music businesses to partner with technology companies on a long-term basis. I do not believe our relationships will simply go from long term to short term. But considering the age we live in, innovation is a must for tech (technology companies), otherwise we will experience a rift between our values, resources and environment, and our business will lose its relevance." (Interview: P12)

"…big record companies have the power and resources to acquire new businesses and bring them in-house, especially those that can benefit their R&D (research and development) department. But this of course is a cost vs benefit exercise. Although, I am dead certain, they are already looking at forming partnerships with guys that are already experimenting in music and A.I etc." (Interview: P3)

4.2.4. The challenge of and need for transparency

Ricardo (2017) asserts that the record industry has traditionally suffered from a serious lack of accountability. As shown by the recent uproar caused by advances paid out to major record companies by music streaming platforms, which were only accepted by the labels after the problem, had become part of the mainstream debate (Ricardo, 2017). Dos Santos (2016) made a similar observation, some artists were claiming that record labels keep the money

received in advance from streaming platforms and that there is little transparency in how artists are paid. When interview participants were probed about their knowledge on how royalties are distributed, only 33% of the participants spoke confidently on the distribution of royalties, the answers were categorised and summed up in Figure 4.13 below.

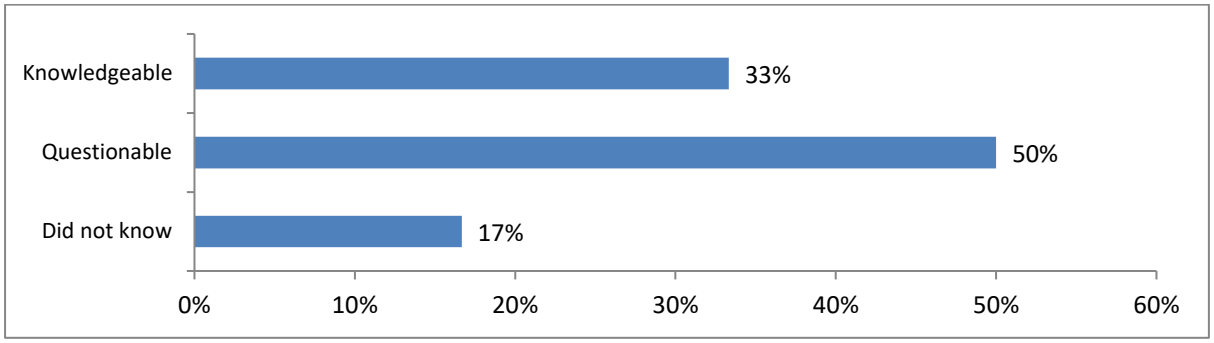


Figure 4.13. Knowledge scale on the distribution of royalties.

Recorded music is a global asset with intellectual property rights that vary slightly from country to country, and attribution of the money received from the selling and performance of recorded music has always been a logistical challenge (Dos Santos, 2016). This is something that all the respondents (n = 12) agree on, the need for a more systematic method of supply chain visibility. Some of the remarks on the topic of transparency can be seen below:

"…the royalty issue has been one of the subjects of debate for a long time and if Blockchain can solve that problem, I am all for it." (Interview: P10)

"If you look at why a lot of young people come into the music game, it is to get paid. There is the perception of there being a lot of money in the industry, granted, you can make a lot of money from music, but it is extremely difficult to do so because of the red tape created by big corporations…." (Interview: P8)

"Transparency is a good thing. I think it's important for an artist to know how much they suck… But royalties have always been a sensitive issue for the industry. And if such a technology exists… where do I sign up. Artists are always complaining about their bank accounts really, this sort of thing will shut them up." (Interview: P5)

A clear account of transactions and agreements between music network stakeholders enriches mutually beneficial cooperation (Ricardo, 2017). Similarly, the more people/organizations who have access to this information, the better decisions they can make, increasing value for themselves and the rest of the network (Ricardo, 2017). Information is crucial in the

knowledge economy. Reaching large numbers of people with rich knowledge before the Internet was an expensive and time-consuming process; however, with today's digital technology, there is no need to make a trade-off between richness and scope (Graham *et al*, 2004).

Transparency necessitates trust, and increased trust among stakeholders results in lower transaction costs (Ricardo, 2017), by effectively "… reducing the resources needed to create and enforce contracts and by eliminating the need for elaborate safeguards and contingencies that require detailed monitoring" (Parmar *et al*, 2010, p. 416, as cited in Ricardo, 2017). This was further reflected by the following remark, when asked about the intermediaries that facilitate the management and payment of artists/musicians in the supply chain:

"… transparency is a nice word, but without trust it means nothing, and the culture here (South Africa) is one of distrust… who manages the managers of the funds? And who manages them?" (Interview: P3)

4.2.5. The understated importance of Piracy and File-Sharing

When Napster was first released in 1999, it had an immediate impact on the music industry, resulting in a drop in music sales the following year (Stabnau, 2016). According to Hracs (2012), the free distribution of large amounts of copyrighted content on sites like Napster has created an atmosphere that poses a major challenge to the musical economy. Some participants' perspectives on piracy were as follows:

"I grew up on seeing ads on DVDs and CDs comparing piracy to stealing, it is in my opinion, one of the biggest reasons why artists are not getting the most out of making music." (Interview: P1)

"Where does the revenue from pirated material go? There are communities, global communities, of people out there dedicating themselves to causes like this (Piracy). They just will not pay but are more than happy to make money from it. They have created websites with millions of users that share stuff on the Internet. These communities thrive… making money from donations, advertising, and crowd funding kind of setups." (Interview: P6)

"I used to pirate a lot before I started working in the music business. Being part of this industry has made me aware of its impact, the lost sales, which now directly impact on my ability to put food on the table." (Interview: P9)

In the digital age, it is so easy to go online and download whatever you want, and almost too expensive to do otherwise, this one of the key reasons why consumers do not see piracy as a problem (Hracs, 2012). When asked if they had ever downloaded a song without the permission of the copyright holder or consume pirated goods in any form, only 8% (n = 1) of the participants replied with a firm "No". Not only do customers recognise the power of piracy, but copyright holders are starting to embrace the modern piracy-based industry as well. This is inline with Mulligan's (2015) observations, as one respondent states:

"We need to embrace it, I have seen big artist drop albums for free, and even going as far as saying download it if you want to, as long as you listen to my music. Artists are meant to touch people's hearts, make them feel good and forget about whatever they are going through. As an artist I want to be heard, regardless of how you got my music, just listen to the songs…" (Interview: P1)

Consumers refused to pay for music due to easy access to pirate sites, and it was this shift in consumer culture that led to the emergence of streaming services (Stabnau, 2016). Music is now more available than ever thanks to streaming services. New digital platforms that allow users to listen to music legally while also paying music rights holders through advertising revenue (Stabnau, 2016). Even though streaming music does not compensate copyright holders as well as physical CD purchases, people consume more music by streaming, so the difference can be made up through sheer volume (Stabnau, 2016). There was no question among the participants about the effects pirated music and file-sharing have had on the industry, whether positive or negative, but piracy and file-sharing have undoubtedly altered the landscape of the music industry as disruptive inventions.

"I think a more important question is what has happened to the supply of new music since file sharing? What people do not understand is that Piracy has in a sense actually brought about the streaming age, it is the strong foundation of what music has become…. Because some people (major labels) only saw the negative influence of piracy and chose to focus only on that, it slowed down their reaction to change and they could not fully capitalise on what was to come. Some companies (tech companies) were more agile to recognise this… they profited … and now we are all enjoying the technological progress that was brought about by such disruptions…" (Interview: P7)

"Brilliant, what piracy did was awaken a lethargic industry, people had become so accustomed to making a lot of money from a business model that had not changed in decades,

it was just business as usual. Until one day people found a different way to access music, which ultimately forced the industry to rethink their strategies and innovate… classic music case study." (Interview: P12)

4.2.6. The fragility of the Majors

With the adoption of MP3 technology and the rise of file sharing, the music industry has struggled to recover, and many have challenged the position of record labels going forward (Bielas, 2013). Content, pricing, and delivery are no longer dictated by the majors, but rather by the new and more powerful players at the distribution end of the supply chain (Parikh, 1999). E-retailers such as Apple and Amazon, and streaming services such as Spotify and Apple Music are now the dominant forces in the industry. For instance, one of the respondents explains:

"…labels used to tell the retail stores what music to sell and when to sell it, they would even tell the stores to put their (the labels) artist to aisles with more visibility, to the front of the shop… this (streaming platforms) has changed, the playing field has been levelled by online digital music shops, now it's a free for all, the price for every artist's music is the same. The labels, even though they still have superior marketing capabilities, now evenly compete with the independent unheard-of-before kid with a computer and mic recording in their mother's garage." (Interview: P3)

Due to the large-scale investments in technology architecture and the introduction of totally different ways of doing business that were required (Mulligan, 2015), major labels were slow to react to the digital transformation challenge (Rogers, 2013). According to Parikh (1999) the pace at which technological changes occur is a factor that works against the majors; however, if the majors behave smartly and move quickly, they can easily turn themselves into new intermediaries and still survive in the long run. The participants were asked if whether they believed the current majors will be replaced by technology companies in the future, on a scale of 1-10 (where 1 is extremely unlikely that this will happen and 10 is extremely possible that this will happen), most of the respondents leaned towards the supersession of the majors by technology companies. The distributions of the answers to this question are summarised in Figure 4.11.

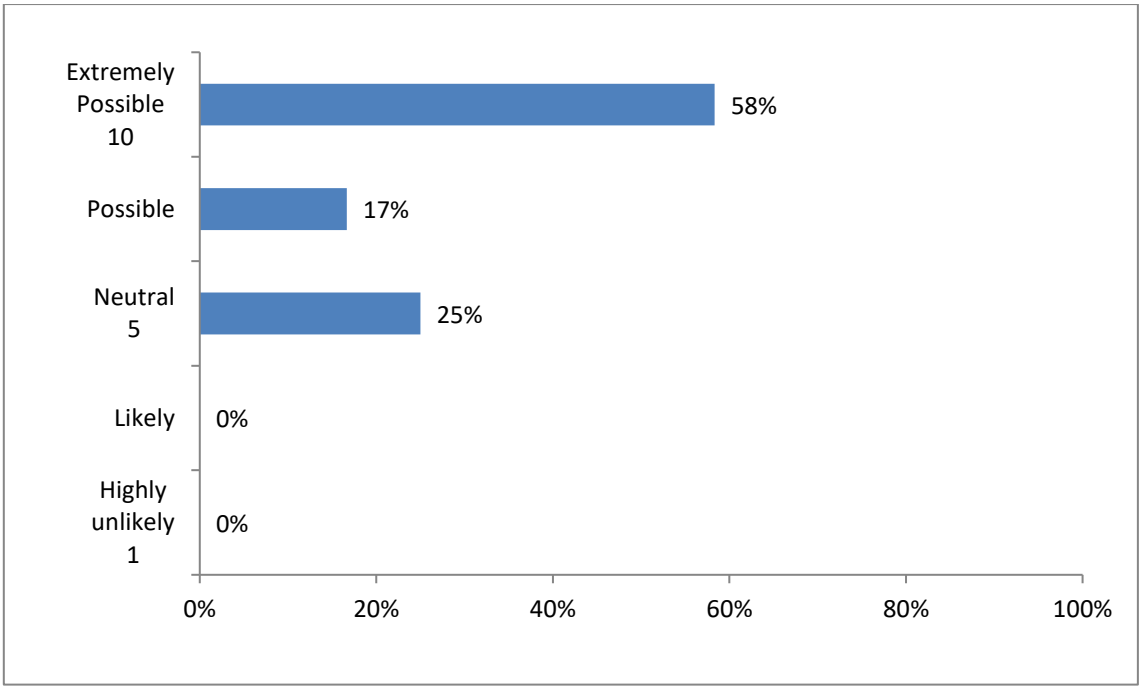


Figure 4.14. Supersession of majors by technology companies.

As stated by one participant when asked if they think that technology companies will have even greater roles in the future and possibly supersede the major labels:

"Yes, most definitely… If you think back, at some point the major record labels lost out on the chance to build their own digital distribution platforms, but they still have plenty of money to turn this around. If they want to remain competitive, they must improve their productivity and scalability to compete with large technology companies, otherwise they face extinction or worse… some background role in an industry they have built." (Interview: P7)

When asked to elaborate on productivity and scalability, the participant responded.

"By productivity I mean they need to be more creative and deliver a combination of music and content that enhances the user experience. If they can get this packaged and delivered to a larger community of listeners and customers, they will have addressed the scaling issue. Currently the tech companies have scaled their businesses well, through computer programs that run platforms that can reach millions of people all over the world at any given time of the day…. This is what the majors are lacking." (Interview: P7)

The needed speed to adapt to change rapidly, demands that they dismantle their current supply chains. Labels now wield enormous power in the industry, but any delay in changing their business structures would result in the rise and strengthening of competitive forces that

will dominate the industry by being first to market as new intermediaries. (Parikh, 1999). As observed by one participant when asked whether the power will remain with the big labels or shift to other players:

"The winds of change have spoken, that power shift has already begun. Independents are on the rise; a lot of artists have achieved success outside of the major's control. The tech companies are more innovative and more forward thinking than the old relics of the industry, the walls are closing in (on the majors) …." (Interview: P12)

Record labels lost out on the opportunity to build their own retail platforms before services like iTunes became mainstream, and even when the labels anticipated changes in the market technology companies were still able to outsell them (Stabnau, 2016). The popularity of Vevo, a music video distribution site created and run by the Big 3 record labels (Universal, Warner, and Sony), which only became successful when the labels agreed to stream their videos on YouTube, demonstrates this. The website of Vevo is currently ranked 6128 on Alexa, a global rating framework that rates websites in order of popularity, while YouTube is ranked second (Stabnau, 2016).

4.3. Research Reliability and Validity

Methodical triangulation was used in the analysis to improve the validity and reliability of the research findings. As previously stated, the report relied on interviews and a literature review, because of the combination of these approaches, the study was more accurate and valid, with less bias and greater generalisability.

4.4. Chapter Summary

The data collected during the research was analysed in depth in this chapter, as well as the crucial factors that must be considered when evaluating the current and future state of the South African music industry's supply chain. Based on the findings and analysis, the discussion and conclusions will be drawn in the following chapters.

CHAPTER 5. DISCUSSIONS

In contrast to the literature reviewed in Chapter 2, this chapter focuses on the results of the study. A comparison of the information collected from the participants to see what they have in common and how their understanding of Industry 4.0 differs; similarly, to what extent they share knowledge of the music industry. The four supply chain dimensions were used in this study to determine the nature of the transition in the music supply chain: (1) the structure of activities, (2) the choice of players, (3) the governing mechanism, and (4) the co-ordinating structure of supply chains. A discussion of the four dimensions based on all the data gathered during the research will be used to contextualise the present and explore the future of the music industry in the final section of this chapter.

5.1. Industry Knowledge

A general divide in expertise was discovered as a common factor during interaction with the participants. In terms of how technological advances have changed the industry's supply chain, it seems that artists are the segment with the least awareness of the industry. In addition, four out of the twelve participants had previous knowledge of the supply chain's Big Data and Blockchain implications. Other interview participants had no previous knowledge of Industry 4.0 related innovations and their potential implications on the network and operations, as these participants explain:

"I honestly did not know anything about Blockchains before you sent me the project summary and sample questionnaire. I only read a few articles after I had accepted the interview."

(Interview: P2)

"I have heard of the Fourth Industrial Revolution but did not know what it was. I remember the government setting up some sort of a commission, but I did not pay it much attention…"

(Interview: P9)

There is some information procured from the informants that had little or no connection with what was written in the literature. Some of these misunderstandings are trivial and have no bearing on fact, but a few are critical to understanding the supply chain's current state. It was discovered that even the most experienced sources did not have all the necessary details. This is an intriguing concept, but it also demonstrates that "errors" do occur while interacting with people.

There were also varying opinions on how deeply technology companies were embedded in the industry. Large technology companies have started to exert leverage over some aspects of the music industry by acting as distributors. These technology companies have recently shown signs of shifting their focus to content development as a complement to their distribution channels as stated by Stabnau (2016). Most of the participants were unaware of the A.I. and machine learning research and development that technology companies were doing. Many of the participants were opposed to the concept of computers ever replacing artists and creators in the supply chain, but they had a limited understanding of how robots, computer systems, and algorithms were already a part of their daily routine. One participant, for example, denied that machines could make music on their own, but acknowledged that they had already taken over some of the artist's creative processes:

"I do not think computers will make music like people because they lack the feeling that goes into a piece of art." (Interview: P2)

When asked about computers aiding his production process:

"I admit sometimes I am lazy, and I use programs to finish up a piece of music or an idea that I have… The DAW (Digital Audio Workstation) that I work with has this interface that can complete a chord progression for you… It is like a cheat sheet." (Interview: P1)

When asked if that idea was a form of artificial intelligence (A.I.) that, if further developed, could enable computers to start and finish pieces of music entirely without human intervention. The respondent replied:

"I hadn't thought of it in that way. Maybe computers can write music…. Can they really do that?" (Interview: P1)

5.1. Industry 4.0 and the Supply Chain of Recorded music

The rate at which new technological innovations are developed and implemented has had a significant impact on the South African music supply chain. Technological advancements will fuel growth, making the music industry more efficient. Massive technology companies will disrupt and replace major record labels, which have long dominated the industry, by behaving like record labels; discovering, recording, and promoting artists as well as producing original music content on their own digital platforms. The implication of these disruptions on the supply chain of music is outlined in the following sections.

5.1.1. Structure of activities

In line with the global industry, the South African music industry's supply chain and activities have been drastically altered because of rapid technological advancements. The way record companies do business has been influenced by digital technology, which has been made easier to introduce thanks to the Internet's widespread impact. The amount of data being transmitted, as well as the variety and speed at which it can be transmitted, has created a gap in the network for big data intermediaries. Most interviewees agreed that they are increasingly seeking help from outside organisations and other people in their network to interpret the large amounts of data available on the Internet and better communicate with customers. This has been brought about by understanding the range of possibilities posed to them using Big Data Analytics

Technology companies have successfully developed online sales services in the form of music streaming platforms in response to the increased digital consumption of music, both legally and illegally, a feat that the major labels have struggled to achieve. The majors' approach has also shifted to working with specialised distribution networks, which is now seen as a more competitive online distribution business model.

The South African networked system of business operations has grown in size and variety, displacing the sequential structure entirely. Physical bodies have been replaced by virtual entities. These findings correspond with Graham *et al*.'s (2004) predictions that the framework of operations beyond the internet age will be a dynamic constellation of virtual operators in a digital product and service market.

Independent artists and independent record companies are now able to carry out more commercial operations on their own, without relying on the Majors, than ever before. The independent can now outsource operations that are not part of their core competencies, thanks to an improvement in their ability to network with other independents. Music industry stakeholders now have more options for forming partnerships to carry out their unique business models. One of the factors that enables the dynamic network of actors is the advancement of digital technology. The findings are in line with Graham *et al*. (2004) and further emphasise Hracs' (2012) view that the music industry will be restructured as technology transforms independent music production from a niche market to a commercial model.

5.1.2. Choice of players

The need for physical music delivery is decreasing rapidly. The internet, e-retailers, and streaming platforms have made it easy for consumers to connect with those involved in music production as well as supply chain intermediaries. This result supports Graham *et al*.'s (2004) assertions that as entry barriers are removed, new specialty companies will enter the market, and a wider variety of potential partners will arise; new combinations of customers, suppliers, and business partners will emerge to overtake incumbents' dominance.

In the current supply chain setup, relationships range from tight alliances to loose collaborations. Examining the latest online distribution approach of major record labels provides further support for the preference for long-term relationships. Most record companies do not sell their artists' music directly on their websites, instead providing links to stores that take a cut of the sale, such as Amazon (15% commission), iTunes (30% commission), and Google Play (30% commission) (Stabnau, 2016). Even though they all license content to various music streaming sites, all the participants (n = 12) decided that record labels do not want to fully relinquish ownership of their content. This finding was in line with Graham *et al*.'s (2004) assertions.

Furthermore, record labels collaborate with several technological partners on strategies on digital distribution and copyright security; as all the participants (n = 12) pointed out, these relationships are more long-term than short-term in today's supply chain setup. According to Hracs (2012), the music industry is going through a supply chain deconstruction phase, which will result in a multitude of potential players participating in the music supply chain, each with their own specific source of competitive advantage partnerships. This is reinforced by the fact that large technology companies have also started to exert control over some aspects of the music industry by acting as distributors. Even though Amazon, Google, Apple, and Spotify do not create their own content, they make a lot of money because they have established themselves as reliable music retailers (Stabnau, 2016).

The supply of music in today's network consists of several different players, as entry barriers to the music industry have been significantly reduced by lower transaction and production costs. These findings are in line with Graham *et al*. (2004). Even if there is a place for long-term partnerships in the industry, it is obvious that the industry will be made up of a more varied and rapidly growing population of player who can capitalise on rapidly changing environments and tastes (Graham *et al*., 2004).

5.1.3. Governing mechanism

According to Graham *et al*. (2004), as more musicians produce and sell music on their own and become more self-sufficient, record labels will show less governance over their supply chain. This is something that all the participants (n = 12) agree on. The number of self-released or independent artists is growing, and the intern*et al*lows them to distribute their work worldwide. The gap between their product distribution and that of major label artists could not be determined, but South Africa is a nation where 56.3% of the population is expected to be online by 2021, with that figure expected to rise to 62.3% in 2025 (Statista, 2021).

According to the findings, the Internet now allows consumers and artists to communicate directly, and both parties are gaining bargaining power. This appears to back up Porter's (2001) argument that the Internet undermines strong networks and transfers bargaining power to customers.

The consensus (n = 12) from the interviews was that governance processes will evolve in the future. This is due to the emergence of a new type of record label: technology companies are increasingly replacing record labels as a means of discovering, recording, and promoting artists, and they are also starting to create original music material. According to the results of the study, this trend will continue, potentially replacing major labels as the leaders of the industry.

As a result, all the participants agreed (n = 12) that record labels are unlikely to remain the strongest player in the music supply chain, and the participants also indicated that the recording companies' dominant role would be undermined. This finding contradicts Graham *et al*.'s (2004) arguments. In essence, the interviewees argued that while alternative consumer platforms and lower entry costs to the music industry would undermine the major labels' bargaining position, many artists will still want to profit from the major labels' experience and advertising. This view is consistent with Graham *et al*.'s (2004) claims.

5.1.4. The co-ordinating structure

To support the Big Data required to handle the selling of digital music, all the respondents (n = 12) agreed that conventional coordination processes and systems would need to be significantly altered. Music industry companies can now operate in a virtual world and negotiate with many suppliers and consumers thanks to the advent of Internet-based digital distribution technologies (Graham *et al*, 2004). Graham *et al*. (2004) and Hracs (2012), on the

other hand, cited the difficulty of conducting business over the Internet. When the number of product offerings grows, so does the need for virtual navigators that can help stakeholders locate each other. Artists and music labels have started to develop partnerships with streaming platforms to reach out to the digital audience. In virtual marketplaces, these intermediaries are rapidly replacing traditional intermediaries' coordination position, addressing Graham *et al* (2004) and Hracs' (2012) concerns.

In terms of coordination, the results show that there has been a significant decrease in the number of physical intermediaries between the artist and the customer, as well as a rise in major label outsourcing of activities. The streaming services, which allow major labels to coordinate their operation with customer demands, are viewed as the most important elements in these new network architectures by all the participants (n = 12).

Traditional intermediaries, such as physical stores, are losing ground, if not completely disappearing. In the music industry, the Internet is now the primary infrastructure for conducting business electronically. According to Graham *et al*'s (2004) predictions of a potential future supply chain, communication and coordination in the music industry will no longer be hierarchical and dyadic, since anyone will communicate with everyone, this is directly in line with the findings. Consumers, as well as artists and record labels, have begun to connect. As a result of the interviews, the streaming platform has gained widespread acceptance for music sales and distribution.

5.2. Chapter Summary

The study investigates how these changes have affected the management of the South African music industry's supply chain and its operations, most especially in the advent of the Fourth Industrial Revolution (Industry 4.0). The study focuses on four supply chain dimensions: (1) the structure of activities, (2) the choice of players, (3) the governing mechanism, and (4) the co-ordinating structure of supply chains. The findings were discussed in contrast to the literature reviewed in Chapter 2 and the information collected from the participants to develop arguments for the current state and future of the music industry's supply chain.

CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS

This research study contributes to a better understanding of the impact of technological advances on the recorded music supply chain in South Africa, as well as the potential for future disruptions. The purpose of this chapter is to summarise the research undertaken. The chapter discusses the key findings of the study, the research limitations, further research that could be performed in this field of study, and a summary of the project's outcome based on the objectives.

6.1. Conclusion

The aim of this paper was to look at how technological advancements are changing the South African music industry supply chain. Based on the literature review and semi-structured interviews with a variety of stakeholders, it was determined that the music industry's network is evolving, and that technology is playing a significant role in restructuring operations.

Historically, the major record labels used to control the production, distribution, and consumption of music; however, the Internet, increased digital distribution, and the music streaming business model have changed that. More and more business is being conducted out electronically and many different types of business models have emerged because of new partnerships. This has also brought the era of physically distributing music to an end. Therefore, the old structures of physical intermediaries are being replaced by new virtual ones. The research also discovered that the vertically integrated supply chain has been replaced by a more complex and versatile network system, reducing the dominance of big record labels that no longer own and manage the major distribution networks.

The South African music industry is made up of a variety of players who are gradually forming an interconnected network, a flexible spider-web-like network that varies significantly from the conventional horizontal chain of actors. According to the research, the number of actors is increasing, and independent artists now have full creative control over the direction and quality of their music and related goods. They have complete control of how they function and can now make music almost anywhere. Technology enables artists to reach the market and sell directly to customers, fully disseminating the conventional music supply chain through the various channels available to independents. On the other hand, to take advantage of these possibilities, musicians must first conquer a new and complex set of obstacles. Even though barriers to entry such as the high market entry costs and a scarcity in

the number of distribution have been greatly reduced, the market is still rife with complexity and competition.

By acting as distributors, large technology companies have begun to exert influence over certain aspects of the music industry. As a complement to their distribution channels, these technology companies have recently shown signs of shifting their focus to content development (Stabnau, 2016). If this prediction comes true, the Big 3 record labels (Universal, Warner, and Sony) will be replaced by a new group of digital media labels, which will include Apple, Google and YouTube, Spotify, and possibly Amazon and Facebook. These new labels will be more competitive and capable of responding more quickly to changing consumer conditions (Stabnau, 2016). These businesses' entrepreneurial, risk-taking mindsets, combined with a wealth of analytic data that can be used to gain a significant competitive advantage over their competitors, will provide them with more room for growth and longevity than traditional record label models (Stabnau, 2016). As this respondent states:

"Technology companies are taking over the supply chain, from supply to distribution; they are taking everything." (Interviewer: P3)

6.2. Recommendations

An opportunity for further research is to seek out new stakeholders who have held executive positions in major recording companies. These participants could provide a lot more insight into the majors' strategies in an increasingly competitive market. Engaging with more experienced stakeholders may assist the researcher in further developing a research area or topic. In view of the skewed record number of publications across countries other than South Africa, the researcher should investigate if there is a shortage of knowledge or interest in the subject.

During the interviews, a common theme that arose was the degree of government intervention in the sector. The government can play a variety of roles in the music industry, but whether by commission or omission, it still influences the network's outcome. Since private funding is difficult to come by, stakeholders exposed an over-reliance on their own money and labour to build and manufacture, rendering their career a high-risk one. They also mentioned a shortage of public funds or their distribution. An inquiry into government involvement in the industry, including how much public support and regulation is needed to keep the industry going and promote education, creativity, and innovation, is one direction the research could go.

6.3. Limitations and Delimitations

The sample size was more than adequate, and the responses yielded insightful results; however, some limitations of this study include the fact that the sources for this paper's interviews are mostly in lower positions within their respective companies and a lot of the respondents work for similar companies, raising concerns that the image of the companies is too restricted. The companies profiled in this research are just one link in the chain. For example, only respondents from major and independent labels were interviewed, even though many other types of business models may provide more innovative perspectives outside of these companies.

The study was also limited to the Johannesburg area, dynamics differ from city to city and the choice of music/musicians that people like also differ. Expanding the scope to reach other big cities such as Durban, Cape Town, Pretoria will might remove bias and add depth to the research.

Another important limitation is the omission of the music consumer's point of view. Ultimately, supply chain must reach the customer, who is arguably the biggest stakeholder in the music industry. The customer may similarly provide an interesting viewpoint to the respondents that are directly linked to from major and independent labels

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CHAPTER 8. APPENDICES

Appendix A: Sample Letter to the Participants.

Date: 11/03/2021

Dear Mr ….,

Re: Participation in Research on Music Recording Industry Supply Chain and Industry 4.0

I am a Master of Science in Engineering student in the School of Mechanical, Industrial and Aeronautical Engineering at the University of the Witwatersrand, under the supervision of Dr Bernadette Sunjka. My MSc research title is: *The Music Recording Industry Supply Chain and Industry 4.0.*

My belief is that much like the global music industry, the South African music industry supply chain has undergone changes as a result of technological developments in the industry. I would specifically like to understand how these developments have affected the management of the South African music industry's supply chain and its operations, most especially in the advent of the Fourth Industrial Revolution (Industry 4.0).

I would like to formally invite you to participate in this study. As a consultant and producer of an established recording company in South Africa, your knowledge and experience would contribute significantly.

The study will be conducted between October 2020 and April 2021. Involvement in the study would entail one or two online interviews with you, at your convenience. Participation in the study is voluntary, and you may withdraw at any time. Anonymity (regarding company name and any owner/manager/employee names) and confidentiality of information provided will be assured and respected. I would like to record the interviews, so I can later transcribe them. Your consent at the time of the interview will be requested. If you do not wish the interviews to be recorded this will be respected.

The results of the study will form part of my MSc research report and may also be reported in academic papers and at conferences. A summary of the results of the research will be made available to you on request.

Please contact me if you have any questions regarding the research and participation in the study.

I look forward to hearing from you.

Yours faithfully

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Appendix B: The Research Interview Model

Since the interviews were designed as semi-structured and semi-guided, this was approached more as a conversation by the researcher, and certainly not as a questionnaire.

The questions posed by the researcher, sought to gain insight into the music industry, technological innovations in the industry and the effect of the fourth industrial revolution on the industry. To illustrate the researcher sought to understand from the perspective of the participants:

- The potential impact on business and the supply chain presented by new technologies.
- The Impact on the different players and how these technologies are shaping the future of the music industry

Questions

Players in the industry

1. How important have different players and/or services been to the operation and development of your businesses/craft over the past five to ten years (List the players).
2. Who are the players with whom you currently interact with the most?
3. What about the players with whom you expect to interact with the most soon?
4. What would you say the strengths and weaknesses of the sector that you currently operate in are?
5. Who do you think are the strongest and weakest players in the industry now?

The Internet's transformation of the music industry supply chain, with some of the major changes being the electronic distribution of music, piracy and artists bypassing the record labels and marketing their own music. This also resulted in increased information reach and which provided an extra boost to the growth of the music industry.

6. Do you see Industry 4.0 technologies having the same kind impact on business activities as the Internet and digital technology did?
7. How do you think this change has impacted the roles of the major labels in the music supply chain? Do you see labels remaining the strongest players in the industry? Or greater influence continuing to shift to independents or other players?

8. How does your label choose and sign new artists? Is there a criterion you follow? Or do you have any idea how this is done?
9. What about the physical music chain stores, like Musica, Look & Listen etc. that have dominated the industry on the consumer end of the supply chain for a long time, closing even as recorded music sees its highest sales since 2014. Do you see an end to the music retail store? Why do you think they could not just move their models to internet-based retailing or distribution?
10. Do you think technology companies will have even greater roles in the future?
11. In your opinion, do you see independents forming their own networks, outside of the major labels influence?
12. Do you think big labels will bring Industry 4.0 specialists in-house or sub-contract and focus on their core competencies? What are your views? What is your company's view? In terms of partnerships, what will the nature of these relationships be? Long term to short term? Formal or informal?

Music streaming platforms, such as YouTube, Spotify, Deezer, Tidal, and Apple Music; at one point seen as disruptive to the industry, are now among the most used tools to access music nowadays.

But with the advent of Blockchain technology, innovators such as the British singer and songwriter Imogen Heap, are building what they call a "fair trade" music industry that aims to sidestep "middlemen" platforms like iTunes and Spotify to give musicians more ownership over the money and data produced by their work using Blockchain technology.

Blockchain technology essentially offers transparency through the value chain, allowing musicians and their managers to see exactly how much money they are owed, as opposed to a culture of non-disclosure agreements and black boxes.

13. What are your thoughts around the idea of musicians having more control and ownership?
14. Do you know how revenue is distributed through streaming platforms?
15. Do you think a platform based on Blockchain technology has the potential to undermine and maybe render the existing streaming platform model obsolete?
16. Based on this premise, how viable is a technology like Blockchain? Is it a pressing need or something that would just be cool to have as an option?

17. With the promise of unrivalled transparency. Could this be the end of music piracy as we know it? Do you see other problems or forms of piracy emerging?
18. Blockchain technology might be premature, but it seems to have the potential to change the music industry and render intermediaries like SAMRO and CAPASSO obsolete. Do you see this happening in the future?

Computers and music

19. Do you have any experience using analogue music equipment?
20. In the digital age, it is a lot easier for artist to make music themselves as opposed to booking sessions in the more established studios. Similarly with marketing, today's artist can literally do what traditional labels di a long time ago all by themselves now. Do you think it advantageous for an artist to be a jack of all trades?
21. Have computers made the process of making music easier? Do you see a greater dependence on computers in the future?
22. There is a strong push in the music technology world, to have computers and robots produce music. The most recently it has been AI, or Artificial Intelligence, getting involved in the music production. What are your thoughts, do you ever see computers replacing the music producer and composer in the value chain?

A restructure was required to support the information necessary to manage the sale of digital music. Conventionally, information flow was sequential Artist-record company-distributor-retailer-consumer. The Internet changed that, now everybody can communicate with everyone in real time.

23. Was there ever a point where you thought you need to change your operational/process/marketing/distribution strategy? What event inspired this?
24. With bigger and larger data sets do you see another restructure for coordinating the SC in the future? Do you see an opportunity for companies that can process the vast information flowing that is now available to music companies?
25. Music streaming platforms are on the rise and stronger before, a lot of the consumers information will now flow through the platforms, do you think the control and understanding of data will yield competitive advantage for the streaming platforms?
26. Traditionally major labels have sought to control the distribution infrastructure of music, through acquisitions etc. Do you think labels will one day control the biggest streaming platforms? Or ever pursue such a strategy?

27. What role do you think the consumers will play in the future? Where AI, social media and technology can be effectively be used to market and influence what the consumer listens to? Do you think the platforms will be used to push certain artists/musicians to the forefront? What about the small labels?

Appendix C: Sample Interview Transcripts

Interview with Participnat No. 5.

Interview conducted via Skype 02/03/2021.

Inter length: 59min

Interviewer: Mr P5, thank you for accepting this interview, most especially at such short notice. With this interview I am mainly focused on getting opinions from music industry players. Whether you be an entrepreneur, a manager of a studio or an executive. I am looking for people that might be interested in applying strategies to gain a competitive advantage or to simply position themselves and their business for the future.

There are two main areas I would like to cover in this interview, that is the potential impact of new technology on the music business, the industry's environment, and its supply.

Now, before we get started, can you provide me with an introduction to your own background so I can tailor the questions accordingly.

Participant 5 (P5): I am a producer and the president of a small Independent label called C5 in Johannesburg, Soweto. I have close to 15 years' experience in the music industry, music is all I know. I started working here when I was 16 and have never looked back. We are home to some familiar, maybe not so familiar names Like Adrian, Artery Gal, Ntombela. Mostly small names but we get by.

Interviewer: So, did you study for music or is it something that you just found yourself in.

P5: Yeah, I studied Sound Engineering at Rau.

Interviewer: With honours? Bachelors?

P5: Honours.

Interviewer: Are you on any social media platforms, I can follow you if you follow me back.

P5: Yes, I am on twitter my handle is X

Interviewer: Cool I follow. In fact, I have a list here with me. Tell me which ones are you registered on?

P5: The list?

Interviewer: Yes, I will share my screen.

P5: cool

Interviewer: Do you see it/ Can I just tell which ones do you use?

P5: Alright, I have twitter like I mentioned, Facebook, WhatsApp, LinkedIn. Oh, and Tik Tok. Hahaha that is a lot now that I say it out loud.

Interviewer: Which of these are for business?

P5: All of them.

Interviewer: Wow that is cool are for real?

P5: Yeah man, I am my job.

Interviewer: Alright that is cool. So, to begin with I have a list of business and services that are relevant to the industry. Wait I will quickly share my screen with you. Can you see the list?

P5: Yes, Sir I can.

Interviewer: Cool. If you could just as a start tell me how important these have been for your business in the past decade or so. If you could just indicate to me which of these are weak or strong to you and your work?

P5: Alright I just say weak or strong?

Interviewer: Yeah man.

P5: Okay. I see streaming, strong. Publishers as in music publishers?

Interviewer: Yes

P5: Weak. Marketing strong. distributor strong. Licensing agencies are quite strong. Those are your SAMROS and RiSAs of this world. International companies weak. Oh, again Collective rights management organisations strong. Hey man, just looking at your list I would say the rest are weak hey.

Interviewer: Alright that cool. I think that works best with the next question you can just give me the strong ones cool?

P5: Cool

Interviewer: Now in the whole south African music industry, which of these would you say are the strongest players.

P5: Alright, let me see. Distributors, streaming, licensing, marketing. And I see there radio and TV, The record companies, and the producers. Yeah, that's it, the rest are weak.

Interviewer: Okay again now, from the same list which of these would you say you interact with the most right. But indicate for now and what interactions as your business changes, do you expect to have in the future.

P5: I do not think I understand.

Interviewer: Nah Just based on your knowledge and past interactions. And maybe expected interactions based on your current goals.

P5: Oh okay. Do I just say yes? no?

Interviewer: You can say most or least.

P5: Alright. Let us see. My current situation. I am just going to choose the most people I have had like encounters with recently, right?

Interviewer: That is cool.

P5: Okay, marketing, distributors producers, and funding agencies. Are most…Oh but they are the worst hey.

Interviewer: Who?

P5: The government agencies.

Interviewer: Is it. How so?

P5: The queues bra. Super long. Plus they have not paid out the covid relief yet. So, its always packed now.

Interviewer: Hahaha I hear you. Now for future interactions?

P5: Okay. Again, the funding agencies, because we want this money. Distributors definitely. Marketing and the producers always.

Interviewer: Alright cool, so to start off, you have seen how the Internet has transformed music right? With the biggest and most notable change being digital music distribution, right? At the same time adding a whole new dimension to piracy, today artists are able to bypass the major record label route completely and are now able to market their own music directly to the artist, all thank to the internet. This has also resulted in an increase of information reach; people are now able to collaborate with some other artist from some other continent

Do you see technologies, future technologies having the same effect? On business activities, as the Internet and digital distribution did?

P5: Yeah, in a good way, yes. A lot of improvements are going to be made, from the process of making music to the way in which we people listen to music.

Interviewer: Can you please expand on what do you actually mean by the process of making music, consumption of music and how exactly do you by level the playing field?

P5: The way we currently make music is extremely dependent on the computer, a couple of decades back music was mostly analogue, buttons and knobs mostly, and it suddenly went digital. Now all those buttons and knobs can be found inside DAWs (Digital Audio Workstations). And how these work is sometimes finish a certain composition for you, say a producer was writing a score for a film, the computer aids the music producers in finishing his work. Not taking anything from the creative process, but these machines certainly do help.

On the issue of consumption, just look how far we have come. Just tell me when last did you see a CD or cassette? At some point we never would have imagined all music being digital but look now. So I definitely think the consumption will change as well, just not sure how.

Interviewer: Have you ever pirated something, a piece of music maybe?

P5: Hahaha, who hasn't?

Interviewer: And you think this change, these new technological advancements, will impact the roles of major labels in the music industry.

P5: You know, unlike, way back, right now It is easy for an individual to play your music, you know, wherever. Some independents that have blew up in the past 10 years do not even know how a major functions, they have completely achieved success on their own. And a lot

more artists are moving towards that business model, it is riskier, the independent retains control, it is more fun and more lucrative if you achieve some level of success. It is difficult to tell if whether this will affect the powers of the world (major labels) because they have the capital to invest in the same R&D (research and developed) of the same technologies in question guaranteeing a permanent seat at the table.

Labels are strategic and technology is definitely helping the independents, but the majors are just way too strong to be replaced easily.

Interviewer: OK, cool, one question that has come to the forefront recently is the longevity of the music retail store…

P5: Hahaha what longevity

Interviewer: Hahaha I know, but companies like Musica, Look & Listen, they have been dominating the industry on the consumer end selling DVDs, selling CDs, etc, but we have recently seen a lot of these stores close shop for good. Do you see an end to the physical music retail store?

P5: Right now, people are streaming man, that model is dead. People are playing music over the Internet. Not to mention there are less CD manufacturers as well. And people don't use those DVD players anymore, when last did you hear someone say, I have this new DVD player you should hear the sound man. No one says things like that anymore.

Interviewer: OK, now what about what about tech companies? Companies that basically write software for companies like Spotify, do you see them having greater roles in the future?

P5: Yes, definitely you know, the buzz words right now are streaming services and digital platforms. So, there is a future there for anyone directly or indirectly working with those services. They have taken over I tell you.

Interviewer: What about what about companies that have been in the game for very long time. Like the majors, do you see them bringing tech companies in-house or do you see them partnering with tech companies in any way. Especially in 4IR experts. What do you think?

P5: Yeah, I mean companies, any big company doesn't always have time to really focus on other functions. So they sometimes out-source activities like R&D. especially if the capital investment is too high. So definitely.

Interviewer: What do you think the relationship will be between tech companies and the majors or any other industry player? Long term short term.

P5: Change is not optional, it will happen. The question is which side of the change do you want to be you know. So, if a company prioritises staying relevant they will have to form a long term relationship with guys that specialise is that kind of thing. It is not going to be a choice at the end of the day. So, in today's age music streaming platforms like YouTube, Spotify and Apple Music, at some point were seen as a new technology that disrupted the industry. But with now with things like Blockchain.

Interviewer: Are you familiar with Blockchain Tech.

P5: Hahaha I wasn't until I read up on it recently, after you sent me you sample questions.

Interviewer: Alright cool, blockchain essentially offers transparency through the supply chain, allowing musicians and their managers to see exactly how much money they are owed, what are your thoughts around the idea of musicians having more control and ownership?

P5: I think it's a good thing. It's important for an artist to know how much they suck. Hahaha. But royalties have always been a sensitive issue for the industry. And if such a technology exists, hey man where do I sign up. Artists are always complaining about their bank accounts really, this sort of thing will shut them up.

Interviewer: There are also questions around how music streaming platforms pays artists right? So, do you think, blockchain have the power to undermine or maybe render the existing streaming model obsolete, or maybe replace it with something else? something new, something more transparent?

P5: Like I said, these companies will be the first to check the viability of such technologies, they will knock every knock and cranny. So maybe they will change the way they operate, but not obsolete.

Interviewer: Do you know how royalties are distributed.

P5: I guess I mean if you think about it, you know if you get radio play. Companies like SAMRO will record that in that database keep a log somewhere and pay you guys out in like 3 years or something this has always been a case but that area is a black box

Interviewer: So, do you think this is like a pressing need?

P5: Yeah, yeah, well it's needed today, you know? But there is no rush man.

Interviewer: So, do you see intermediaries like SAMRO, CAPASSO etc being obsolete then?

P5: Oh yes, a big fat yes. Those guys do not know what they are doing, just everyone in this country. They have messed up so many times, I just do not see them surviving big industry shifts like that. If the system is transparent, then they will have achieved new levels of useless hahaha.

Interviewer: There are companies like Google, investing a lot of money to have computers produce their own music without the need of a human intervention. So essentially, Artificial intelligent music production. Do you see, computers replacing the music producer or musicians?

P5: No, I don't. I feel like an artist share their feelings through their music. So I highly doubt a computer can do the same hahaha. I just don't see that happening.

Interviewer: Hahaha so you don't see a computer ever making a hit, no?

P5: Yeah, maybe, it might replace all the electronic music dudes, but it's not going to be the same man. I mean how will this computer relate to people.

Interviewer: OK, so back in the day right a restructure was required to accommodate all these changes that came with the digital transition. I mean systems to support the information necessary to manage sales of digital music over the Internet. Especially with the artist record, going straight to the consumer, right? Do you see in the future, the need for another restructure?

P5: With tech like blockchain or whatever? I do not know what will happen. Will the artist revert back to the old model? that being via big facilitators like labels. I do not know man. But I think both channels will continue to co-exist.

Interviewer: Well yeah, so now with streaming platforms again you have vast amounts of data flowing through these platforms. I'm talking about artist information, listener information and preferences.

Do you see streaming platforms? With this data in hand, retaining some sort of competitive advantage. Do you think this will help them in some way?

P5: Yes, most definitely. The information that they handle on a daily. I mean, if they know that the people in South Africa now listening to this artist, you know they are able to probably Just bump him up on the playlist so that they get more streams than the competition. The artist gets more streams, but the customer is satisfied with service at the end of the day.

I think power they have now will give them an edge, especially if they ever decided to have their own stable. This will have to be regulated somehow, that is actually something to think about.

Interviewer: Do you see an opportunity for companies that that deal with processing large information, large sets of data. Do you see an opportunity for them in this business? Even though music is not their core business.

P5: Yeah, yeah, I do see an opportunity, like I mentioned before tech companies have a future, in every industry in every part of the world. For streaming services that is a lot of information, they will need help in making sense of the data right. If they do not invest in that function in-house, they will out-source it.

Interviewer: Okay So what role do you think consumers will play in the future? Based on the fact that what we listen to is always marketed to us, until the music becomes familiar and eventually starts to sound good. Just like social media marketing social media and.

P5: It's going to be a huge role; you know because right now it's easier to get to get closer to your listeners using those platforms. All that marketing information will drive their decisions as well.

Interviewer: Alright, before we hang this up is there may be anything you would like to add or something that we forgot to ask something that you think is relevant to this particular conversation.

P5: Now is nothing else man, I have to go anyway.

Interviewer: Okay thank you man, much appreciated. Can you maybe hook me up with some one that you know, that might be willing to help me with this study?

P5: We can talk after this man; I really have to go now.

Interviewer: OK no thank you very much for your time Sir, you won’t mind a follow up interview?

P5: Yeah sure.

Interviewer: Okay then, see you again in the near future,

Interview with Participnat No. 4.

Interview conducted via Skype 02/03/2021.

Inter length: 55min

Interviewer: Thank you for accepting this interview. I highly appreciate it. So, our main focus will be on getting opinions from players, entrepreneurs and execs. Basically people that might be looking at strategies. To position themselves and their business for the future in the music industry. We will basically Cover 2 main areas in this interview, right? Which are, one, the potential impact on business and the supply chain by technological innovations. Two, an impact of these technologies on a different player and how they are shaping the future of the industry right now. Before we get started. Could you just provide me with an introduction to your own background so that we can tailor this interview accordingly?

Participant 4 (P4): Alright, my name is Mr P4, say name is P4. I am known as Mr P4 to my peers.

Interviewer: Yeah, so basically what do you do? What are you doing Sir?

P4: I am a programmer and web designer at C4, we design computer application for a variety of tasks for a variety of companies and business hahaha.

Interviewer: Do you have a connection to the music industry?

P4: I have been part of a team that helped X get off the ground. That is an online music jukebox that plays local music only.

Interviewer: Oh, so like a streaming platform.

P4: Not exactly, but it works somewhat like that. More like a radio station though.

Interviewer: Alright sounds cool. Did you study computers.

P4: I studied Informatics at X

Interviewer: What level?

P4: I have a bachelor's degree

Interviewer: Okay cool so you must smart man. I'm am sure you have a big following on social media.

P4: Not really.

Interviewer: Is that so? What social platforms are you know? No wait I have a list for you. Can you see my screen?

P4: Yes, Should I just tell you?

Interviewer: yes sir.

P4: Okay WhatsApp obviously, twitter Facebook and Instagram. YouTube because I have a Gmail account and LinkedIn.

Interview: Do you use them for business and work?

P4: Twitter I follow my interests which are obviously linked to my work LinkedIn and Facebook that's it.

Interviewer: Alright that's cool, I will be sure to connect with you. Tell me something. Do you know of anyone who makes music?

P4: Hahaha yeah tons. Just kidding. But I know some people who have "Music studio setups"

Interviewer: Music studio setups?

P4: Yeah, bedroom studios

Interviewer: Oh, I get you. Tell me something how easy do you think it is to make music today vs like thirty years ago. On a scale of one to ten, with 1 being extremely easy.

P4: Dude what are you saying that has to be a one.

Interviewer: Okay, that's fair. So, to start thing of. I will share my screen with you. Please let me know if you can see.

P4: Yep.

Interviewer: What you are looking at is a list I have put together of music stakeholders right. Now has you're your company ever worked with any of these people.

P4: Yeah man…of course.

Interviewer: Okay that's cool. I would like to point out to me which of these are relevant to what you do, especially the past say five to ten years, your business you know. With other people I have been asking them to just point out the people you find relevant, by identifying them as week or strong. Or just point out to the strong ones I will assume they are weak.

P4: Hahaha what?

Interviewer: Okay, if you find one of them relevant to you or your job, business. Just say strong. Right

P4: Okay right.

Interviewer: Cool, go.

P4: Marketing, digital distribution and streaming platforms.

Interviewer: Is that all.

P4: Hahaha yeah.

Interviewer: Okay, now tell me which of these do you think are the strongest stakeholders in music.

P4: Just point out the strong guys right.

Interviewer: Yes, exactly.

P4: Again streaming, digital distributor and again marketing. Oh, add the record labels, radio and tv.

Interviewer: Hahaha you think highly of digital distributors. Tell me something on a scale of one to ten, with one being like highly unlikely and ten. Well being a ten. Do you think companies like the popular distributors will replace major labels?

P4: Yes.

Interviewer: But with that said, do you see, do you see? Technology companies having greater roles in the future definitely. Can you elaborate?

P4: Definitely a 10. You're also going to have to come up with some ways to compensate that part as well. Yeah, music I can decide to go online as well looking listen instead of having

physical shops. They can also decide like listen let's just partner up with these technological companies that are making paving the way for this new era, so you know. If they are also. Do they also still want to stick in that business? Those guys are just more creative. I am a big fan of Tidal you know, that's the next generation of record label.

Interviewer: Cool. I like Tidal as well. Now what I need from you is to point out. Which of these do you interact with the most? You said you have worked with some of these right?

P4: Yes.

Interviewer: So, shoot, you can answer in the same way as before.

P4: Just marketing and distribution, I guess.

Interviewer: Hahaha okay. That's fair given what you do. So, any expected future interactions?

P4: The same.

Interviewer: Alright. We can move on, I guess. So now the Internet has transformed music supply chain forever. As you know what? Music distribution now being electronic. Piracy being an easy thing, an artist basically now bypassing record labels and marketing their own music, right? This has also resulted in music reaching their peaks. In their history or now looking forward, you see. Technologies like artificial intelligence and blockchain having the same kind of impact on business activities as the Internet and digital distribution did.

P4: In future things will change, but that could change is the only constant cause. It's just how life is. I do see them taking over. And but as for when exactly I cannot project, but I do see them. Taking over, which in my opinion is a little bit of a shame because kind of like taking. Make jobs from people you know. So, let's say that the downfall of it all. Hopefully, it won't be. I hope it's a slow progress, but not a quick one. Because people will be unemployed, some people are pointing English, so do you see this this this affecting the holes that major labels have had on. Play music value chain. From the inception of the digital age. Mary seen everything talking like what is this like 20 years back now 20 plus years back. It did. It messed a lot of things for the major record labels, but they also adapting. You know, it's just the name of the game. Right now, we have to learn a debt and just trying to check way. They can also make a revenue out of everything that's coming along with technology and artificial intelligence coming through. You know things like that.

Interviewer: So now. One other impact technology has had on. The music value chain, as we've seen it with your physical retail stores like Music, look and listen, etc. You know these are stores that have dominated the consumer end of the supply chain for a very long time. And recently music eyes closed doors look and listen for some time now. Do you see an end of? The music retail stores. The guys that sell the CD's and DVD's. Do you see an end of that era?

P4: It has been an end for quite some time to man has been. I bet we have to. We have to give our property then they hang out, you know try to weather the storm. So, I have to give props to them as well. But unfortunately, people just do not buy CDs anymore; I haven't seen a CD player in years. Today, I cannot imagine where I would go if I wanted to buy a CD. Maybe I can search on the internet, but those things are obsolete now and so is that business model. But yeah, who is this changed dramatically over the past three weeks? Hard copies are attired like diamonds, not diamonds. I had to find this dictating music easy off their phones, the Internet streaming and all of that. So, I don't.

Interviewer: Do you think there was a missed opportunity?

P4: I think if they didn't take it, I have to do some research on that as well. They haven't. I mean they closed out, didn't tested. Then they should have went online. They should've went online and try to make their own. Apple Store type set up if it makes sense, you know. Try to make it exclusive to South Africans as well cause we all know that Apple is like international. They could have just branded it like a homegrown type setup. Yeah, that's what I think they should have adapted. Instead of closing everything down, they should have adapted.

Interviewer: In that sense you spoke about them partnering with tech companies now in case in the case of the major labels, people that have. An abundance of resources, money, and capital to invest. Do you see them partnering with these tech companies in any way and I mean, the nature of this relationship? Do you think it will be a long-term kind of relationship or something that is contractual? You know subcontracting a tech company to handle. A particular part of the business that is not exactly. That I could label school function. Do you see that happening?

P4: I do see that happening. Touching on that, I think. If like there's any doubt they did, they should be like sign likely. A country provided just test the waters. And then after that they

should see where it could take them both for the tech company and. You know that the record labels. If it has not been done yet, I would strongly recommend that they start doing it cause the new age is taken over guys.

Interviewer: These companies, do you see a future for them? I'm talking about companies that. And not necessarily in the music industry, but. Are in the software engineering the app development? Do you see a future for those kind of companies in the industry? Or do you see an industry? Being independent from tech companies.

P4: It's a good question. Well, where we heading there? The industry is going to jail a lot with the tech companies more. That's what I think is going to happen. Things I see media liquid record labels me too. Need to speak to these guys and try to develop a relationship with them as well. If they want to stick around cause they immediately will safety in around for quite some time, centuries actually so it would be kind of heart-breaking just to see like. That there won't be a need for them anymore. It's kind of kind of sad because. Also, playing a major role when it comes to developing artists most important thing and they're budgeting, developing artists. So, with these new platforms. These kids have to understand that they've begun to come in and basically. It's just going to have to be superstars off of the bed. You know what I'm saying like? Which is which is? It's going to be. It's going to be hard and a lot of them, and a lot of careers are going to go down South bro. For the sake of the music industry. Just that even the major record labels they should look into it. Inside not have a negative aspect to it. We know that change can come with a little bit of negativity, but they have to see that this is where the world is going right now.

Interviewer: OK, OK, I mean you touched a bit on ownership there, right? I mean with music streaming platforms such as your YouTube, your Spotify, or Apple Music, at some point I mean they were seen as it is disruptive. Kind of force in the industry, right? Something new? Something that we didn't quite understand. But now among the most used tools to access music, right? Yeah, and now with the inception of something like blockchain where innovators like the British Singer who image and hit building some something they called the Fair-trade music industry. That isn’t to sidestep. Or bypass your middleman like iTunes and Spotify in order to give musicians more ownership over the money and information that they produce with their work, right? I mean, essentially blockchain offers transparency. In the value chain, allowing musicians and their managers to see exactly where the money is coming from, how much they are old, as opposed to. Uh, these platforms where

you don't really know what's going on behind the scenes now? What are your thoughts on? Musicians. Having more control and ownership over there. Works.

P4: I think it's a good thing for, specifically the musicians. It's a good thing. But then. Once again talked about you, you Apple Music or iTunes. Most people are hiring people. You know that work behind the scenes. The transparency part I can understand. Yeah, we all need to see where the money is going, where it's coming from and all of that. So, partnerships again like this is what I'm stressing that we all going to need to partner with each other just to make sure that people are still eating within. I like companies like you. You know, Apple music and what not. They are also going to have to adapt to that as well because. People are getting more knowledgeable. Is that the word here? People are getting more smarter about their money. We want to see what's going. Want to see where it's coming from? So, they also going to have to adapt to that and make it more transparent as well where it means sidestepping the blockchains or partnership or going into partnership with them as well. Either way they going to have to think about it so that. Nobody goes hungry man, that's my biggest concern man feel like this new age. It's going to get people to go hungry and look out for other jobs. Yeah, I mean, I mean, I mean this. This technology is still premature, yeah, but it's going to go big.

Interviewer: So, do you see? With this kind of technology, I mean intermediaries or middleman or third parties like some role in CAPASSOS's etc. Those are the guys that. Literally manage artist and musician royalties. They decide who gets paid when and how much. With this kind of technology in place, a technology that offers complete transparency, do you see? It rendering third parties like some ruin Capasso obsolete in the future with rendering them useless. I haven't thought about it, but the quick thought it could run them out of the business cause. So, what are you going to need them for? If blockchain offers the same kind of service and more than what, why do we need info? No with ownership. Do you think this is a pressing need? Something that is needed now or something that will just be cool to have as an option for the artist something.

P4: That was needed like yesterday. Change is a slow progress, so I'm not going to say they're going to need it now. Blockchain and companies like blockchain probably still need to prove themselves a little bit more for artists to be like you know, at a middleman dead party. I sunburn, you know. So not immediately. But in the future. It's going to be a big topic for artist to not even consider the third party or, you know, cause transparency. Transparency is

being the most important, especially in the world we live in, and everything is just appreciating, you know. It's not like 20 years ago we almost everybody could afford the basic necessities like it's just becoming harder now man

Interviewer: OK. I mean? In terms of these technologies, there's also a strong need or strong push by tech companies like Google and IBM that are creating these artificially intelligent programs in artificial intelligence, like your Siri on the iPhone, right? Something that can. Interpret data and make its own decisions, right? I mean now computers are starting to produce and make music. I'm getting involved in music production. What are your thoughts? Do you see computers ever replacing the musician? I mean, you get these computers then literally make a piece of music.

P4: OK, honestly, I hope not. He did it. That's a good question. Is kind of hard. cause I don't want to accept the fact that that's where the world is heading. I hope not because yo man. I mean that that that the core foundation of us listening to an artist. Is, He relates to them. You gonna relate to an artificial. But here's the thing, you just know the piece of music and maybe say a big platform, a big streaming service with a lot of capital. Get so computer to write a certain piece of music and they put a face to it. You don't really know that a computer had a hand in their production.

Interviewer: Do you see it making PC computers making the process easier? In terms of music production.

P4: In terms of music production, I hope it does, but I in terms of the artist, the artist themselves. There's not a I don't want that to happen, man. I mean the artist, you know that produces can get help from, you know, the AI technologies and all of that. But I think that's as far as it should go. I think we should treat music as a secret thing guys. Music has been around for centuries. And yeah, he owns actually. And tries to just hand it over to artificial intelligence. That would be a robbery two to humanity in in, in all like its existence man music is one of the most important things that we've ever created, which is positive. So, I would indicate that I just hope it doesn't happen, man. Is a strong visibility that it could happen, cause yeah, people eat this technology thing at people there.

Interviewer: So, in the olden days you know you had. Information throughout the music supply chain, I mean music went from the artist through the record company through your distributor. Your physical record distributor, right? And then you had your physical store

retailer and then the customer right now. You have a chain where the artist can go directly to the consumer, bypassing everything and marketing his own music, etc. Right? The Internet has changed that. Now everybody can communicate with everyone in real time. And with that comes an increase in information, bigger and larger data sets for companies to. System. And you see the supply chain changing. I mean that that that flow of information you still do, you see the need for artist to go through. Another intermediary and reach the consumer in the future. Or artists will still be able to market directly to the customer.

P4: I think. for beginners. They should still go the traditional route, so to speak. I know when I say traditional, I know there's a couple of links that will be erased, but. You know, like for instance, the marketing if it fits and you artist. They're not necessarily going to. Unless if they did marketing at school, that would be a bonus for them I guess, but. Specially for new artist, I still think they kind of have to take the traditional route, so to speak. And then, you know once they get. The experience that they need and the fellowship or the friendship. Then they can divert to just artist directly to the consumers you know. But no, especially for this new artist, I wouldn't advise them that they do that now.

Interviewer: I mean in this day and age you have these streaming platforms that handle. Lot of information. I mean I'm talking artist backgrounds, demographics, what people are into at this particular point in time and what is hot, right? Do you think understanding that data better will yield some sort of a competitive or this competitive advantage for these streaming platforms you see them using information as a weapon to arm themselves as better businesses of the future, definitely.

P4: Knowledge is power man. The more information that they have, it's probably the more you going to be more interested in buying the artist music. As a consumer, you know. You go through your phone sometimes, like for instance. I go through I've Apple on my phone that I music app on my phone. Every Friday, drop Music Pro and it's like. I kind of feel like they can also do a better job because. We are dropping someone that I've never seen before and it's like OK, I'm not going to download who is this you know and like the ones that I took the time to. To get to know, for instance, you know so. If they kind of work out a better way of like marketing them so to speak. And yeah.

Interviewer: Well, you said you said that knowledge is power right? And with that power I'm sure comes great responsibility. Do you see these platforms pushing an agenda? Seeing,

pushing some artists, and trying to influence the market somehow? Trying to influence what the consumer actually listens to?

P4: You know, constantly driving their own people up the charts down the charts however they see fit. It is a possibility. But then, as me personally is a music enthusiast at that won't. Their own in my judgments on how I view music. Maybe the upcoming generations will be. More. What is the word succumbed to that you know to that ideology that we want you to listen to this? We want you to listen to that.

Interviewer: So that said, do you think consumers will have a greater role or a lesser role? In the supply chain in terms of maybe I'm what it is that the musicians down the supply chain needs to produce. In terms of what it is that we like to consume. You think they will have any bargaining power over the supply chain in the future?

P4: Not, I don't, I don't. Uhm? At their own is kind of a weird one. But in a nutshell, I don't think it will necessarily know. No, not necessarily. OK, I'm going to need it.

Interviewer: Does it depend on the type of music?

P4: I mean, of course, I mean music is still a creative process like artist, produce what they feel like, how they concrete or like. not necessarily. Comcast just influence what is being pushed down the line. I mean, if the world suddenly went gospel and a lot of artists will really move towards producing gospel.

Also, other genres because it is more popular. That is what is popping on the streaming platforms. That is what needs to be made in order for us to become a success.

Yeah, you see, if you put it like that, that that's a nice. Wrong you see I disagree. cause we are not robots; they build their robots. We are not the robots. I'll use myself an example as a gay again. Personally, I like a pop. Yes, this other channels that I listen to, but I don't think they will have an influence that great it would. Kind of **** but they did and if it worked, actually it would. It wouldn't be cause. Now we're diverse, man. We are not the same person. Basically, that'll be general like creating account so to speak, man. Dad, I don't see that one working. I don't see that one working at all.

Interviewer: What about the smaller labels? Do you think? I'm this technology will or is there an opportunity for them to use data to interpret what the market or where the market is headed?

P4: It should work. Yeah, it could work in that aspect. Even for the big labels, man cause they're not gonna go anywhere anytime soon, they're gonna fight the fight for as long as they can.

Interviewer: OK, now before we hang before we hang up, is there anything that you would like to add something that we forgot to ask maybe? Something that you think might aid this. Some way

P4: OK so. What I think should happen again is partnerships guys. We will see whether World is heading. I think you know, partnering up with each other, that's the best solution. So that you make sure that everybody gets to eat man, that's. That's what I think should be done. Nobody wants to see anybody getting out of the game, you know. I think they still some I did this is gonna be a lot of work, but they are still some avenues whereby. People are companies or point whatever the case may be, hold all the entities mentioned in the interview. I think they can find ways to work with each other and I don't think. It should be an instant solution type thing. Two minutes noodles and then yeah, the major labels are no longer needed in anything like that. cause like I said, they also play a major role. In developing the artist and so forth. For example. I. Can look at Drake for example. Let's say trade took. Then you know this new route whereby he didn't. Have the Young Money and you know the other entities behind Young Money developing him. You know I don't think. Would be we is right now so. It did my I think that's what the solution is. Just need to the industry. I don't know how it will happen now when, but they just need to be. Maybe a legislation created for every entity to work with each other and just try to find a way for everybody to eat cause the pie is big. I think it is big enough for everybody, yeah? So yeah, those are my final words. Thank you.

Interviewer: No thank you for your time. Kind Sir. Alright, we might be following up with the second interview I know.

P4: Thank you for your time and thank you.

Interviewer: Thanking you for your help in this study. Alright, thanks.

Appendix D: Data Tables Used in the Analysis

Table 8.1. Relevance of the industry players

	Freq		%	
	Strong	Weak	Strong	Weak
Music Publisher	2	10	17%	83%
Retailers	2	10	17%	83%
Manufaturers (Clothing Mechandise, CDs, etc)	2	10	17%	83%
Lawyer	3	9	25%	75%
Managers	3	9	25%	75%
Production Company (recording/Songwriting)	4	8	33%	67%
Record Company - National	4	8	33%	67%
Music Video Producer	5	7	42%	58%
Record Producer	5	7	42%	58%
Collective Rights Management Organisation	7	5	58%	42%
Record Company - International	7	5	58%	42%
Radio & TV	8	4	67%	33%
Public funding agency	9	3	75%	25%
Licensing Agency	10	2	83%	17%
Digital Music Distributor	11	1	92%	8%
Marketing/PR Agency	11	1	92%	8%
Streaming service	11	1	92%	8%

Table 8.2. Music stakeholders' current interactions.

	Freq		%	
	Most	Least	Most	Least
Lawyer	1	11	8%	92%
Music Publisher	2	10	17%	83%
Manufaturers (Clothing Mechandise, CDs, etc)	2	10	17%	83%
Retailers	3	9	25%	75%
Music Video Producer	4	8	33%	67%
Record Producer	4	8	33%	67%
Production Company	5	7	42%	58%
Marketing/PR Agency	5	7	42%	58%
Record Labels	6	6	50%	50%
Managers	7	5	58%	42%
Digital Music Distributor	7	5	58%	42%
Public funding agency	9	3	75%	25%

Table 8.3. Stakeholders' expected future interactions.

	Freq		%	
	Most	Least	Most	Least
Lawyer	1	11	8%	92%
Music Publisher	2	10	17%	83%
Retailers	2	10	17%	83%
Manufacturers (Clothing Mechandise, CDs, etc)	2	10	17%	83%
Managers	2	10	17%	83%
Production Company	2	10	17%	83%
Music Video Producer	4	8	33%	67%
Record Producer	4	8	33%	67%
Record Labels	4	8	33%	67%
Public funding agency	7	5	58%	42%
Digital Music Distributor	8	4	67%	33%
Marketing/PR Agency	10	2	83%	17%

Table 8.4. Perceived strength of the players.

	Freq		%	
	Strong	Weak	Strong	Weak
Retailers	1	11	8%	92%
Music Publisher	2	10	17%	83%
Lawyer	2	10	17%	83%
Manufacturers (Clothing Mechandise, CDs, etc)	3	9	25%	75%
Managers	3	9	25%	75%
Music Video Producer	5	7	42%	58%
Record Company - National	5	7	42%	58%
Production Company (recording/Songwriting)	6	6	50%	50%
Record Producer	6	6	50%	50%
Record Company - International	6	6	50%	50%
Collective Rights Management Organisation	7	5	58%	42%
Marketing/PR Agency	8	4	67%	33%
Radio & TV	8	4	67%	33%
Licensing Agency	10	2	83%	17%
Public funding agency	10	2	83%	17%
Digital Music Distributor	11	1	92%	8%
Streaming service	12	0	100%	0%

Table 8.5. Difficulty to produce and distribute a song.

	Freq	%
Very Easy 1	12	100%
Extremely Difficult 10	0	0%

Table 8.6. Social media footprint.

	Freq		%	
	Registered	**Not Registered**	**Registered**	**Not Registered**
WeChat	0	12	0%	100%
Messenger	2	10	17%	83%
Reddit	3	9	25%	75%
TikTok	4	8	33%	67%
Telegram	5	7	42%	58%
Instagram	8	4	67%	33%
Linkedin	9	3	75%	25%
Facebook	11	1	92%	8%
Youtube	11	1	92%	8%
Twitter	12	0	100%	0%
Whatsapp	12	0	100%	0%

Table 8.7. Social media use for business activities.

	Freq		%	
	Not For Business Activities	**For Business Activities**	**Not For Business Activities**	**For Business Activities**
WeChat	0	12	0%	100%
Messenger	0	12	0%	100%
Reddit	0	12	0%	100%
Telegram	0	12	0%	100%
TikTok	2	10	17%	83%
Whatsapp	4	8	33%	67%
Instagram	5	7	42%	58%
Facebook	5	7	42%	58%
Youtube	5	7	42%	58%
Twitter	7	5	58%	42%
Linkedin	9	3	75%	25%

Table 8.8. Perceived participant knowledge of royalties' distribution..

	Freq	%
Did not know	2	17%
Questionable	6	50%
Knowledgeable	4	33%

Table 8.9. Likelihooh of majors being replaced by technology companies.

	Freq	%
Highly unlikely 1	0	0%
Likely	0	0%
Neutral 5	3	25%
Possible	2	17%
Extremely Possible 10	7	58%