UNIVERSITY OF KWAZULU-NATAL

DIGITAL SUPPLY CHAIN DISTRIBUTION OF MUSIC IN THE SOUTH AFRICAN RECORDING INDUSTRY: DURBAN REGION

by

Praveena Ramnandan

Dissertation submitted in fulfilment of the requirements for the degree of

Masters of Commerce in Supply Chain Management

College of Law and Management Studies

School of Management, Information Technology and Governance

Supervisor: Dr T.P. Mbhele

2015

DECLARATION

I, **Praveena Ramnandan**, declare that:

I. The research reported in this dissertation/thesis, except where otherwise indicated, is my original research.

II. This dissertation/thesis has not been submitted for any degree or examination at any other University.

III. This dissertation/thesis does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons.

IV. This dissertation/thesis does not contain other persons' writings, unless specifically acknowledged as being sourced from other researchers. Where other written sources have been quoted, then:

a) Their words have been re-written but the general information attributed to them has been referenced; and

b) Where their exact words have been used, their writing has been placed inside quotation marks, and referenced.

V. Where I have reproduced a publication of which I am author, co-author or editor, I have indicated in detail which part of the publication was actually written by myself alone and have fully referenced such publications.

VI. This dissertation/thesis does not contain text, graphics or tables copied and pasted from the Internet, unless specifically acknowledged, and the source being detailed in the dissertation/thesis and in the References section.

Signed: _____

ABSTRACT

The advent of the Internet as a music distribution channel led to significant transformation of the South African music industry at the end of the twentieth century. The Internet and electronic supply chain systems influences customers to migrate from physical product offerings to digital downloading platforms that offer access to digitalised music distribution and quasi-real-time consumption. While technological innovations have enhanced the digital distribution of music online, distribution systems have become a challenge within the supply chain network. This study aims to determine the implications of the paradigm shift in supply chain music distribution from analogue to digital.

This research study has five objectives: firstly, to explore the challenges confronting the supply chain transition from analogue to digital music distribution systems; secondly, to examine the distribution operations processes for the digitalisation of music in relation to the effects of global market demand; thirdly, to evaluate the effects of supply chain value adding innovations in influencing digitalised music distribution and consumption in the recording industry; fourthly, to establish the extent of technological viability to which the Diffusion of Innovation theory enhances supply chain distribution competitiveness; and finally to assess the relative magnitude of supply chain competence and capability response to digital supply chain music distribution. The researcher selected an exploratory research design to explore digital music distribution in the South African recording industry. Univariate, bivariate and multivariate statistical analysis techniques are employed to analyse the data collected from 217 musicians.

This study reveals several elements arising from the growth of digital music distribution in the Durban region, and makes a scholarly contribution to the promotion of the South African digital music market. The results provides support for: the disintermediation of physical retail stores which are perceived as the driver of digital music distribution; an increase in the number of independent artists and music entrepreneurs; and technologically compatible media devices that encourage more music downloads. The tools provided by the Internet inspire musicians to engage in creative music innovation, thereby creating global competitive standards. The study's recommendations provides further insight and understanding of the digital music distribution sector.

Key words: *Digital music distribution, digital distribution, electronic distribution, disintermediation, music distribution, Durban electronic music*

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

GLOSSARY OF TERMS

P2P: is an acronym for “peer-to-peer” or “peer=to-peer file sharing.” In a P2P network, the "peers" are computer systems which are connected to each other via the Internet. Files can be shared directly between systems on the network without the need of a central server. In other words, each computer on a P2P network becomes a file server as well as a client. The only requirements for a computer to join a peer-to-peer network are an Internet connection and P2P software.

Physical format: A format which prepares a disk for a specific type of disk controller, and performs tasks such as sector identification. Such a format will destroy all data on a disk, while a high-level format only resets file-allocation tables so that the operating system sees the disk as empty. In the case of a hard disk, a physical format is usually performed by the manufacturer. Also known as low-level format.

Product architecture: Product architecture is the scheme by which the functional elements of the product are arranged into physical chunks and by which the chunks interact. This definition links architecture to system-level design and the principles of system engineering. Architecture also has profound implications for how the product is designed, made, sold, used, repaired, etc.

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 Introduction

The last Look & Listen store in KwaZulu-Natal (KZN) closed its doors for business in 2013. Look & Listen, the oldest South African music chain store that began trading in 1969 (Shevel, 2014:1) filed a Business Rescue Notice stating that the company was in financial distress and was not profitable for the financial year ending 2013 (Look & Listen, 2014). The company's managing director reported that fourteen of the chain's nineteen stores were not achieving their monthly trading targets. Among the reasons stated in the Rescue Notice (Look & Listen, 2014:2) were "escalated migration of customers away from physical product offerings within the music, gaming and movie catalogues to digital downloading platforms."

This statement is reiterated by Giletti (2012:2) who reported that "rapid growth in the market for digital music has been led by the popularity of online download stores such as iTunes and streaming services. Consumers now have the option to acquire songs from a variety of paid and non-paid legitimate sources, as well as through unlawful channels." The popularity of Moving Picture Experts Group Audio layer 3, commonly known as MP3 players with their convenient offerings, has taken music distribution to new levels. This research study aimed to determine the effects of the evolving information highway on supply chain distribution channels in the South African recording industry. The research participants are members and non-members of the Recording Industry of South Africa (RiSA). The RiSA is a trade association representing the interests of music producers, and major and independent labels in South Africa (SA) (RiSA, 2014).

Musicians signed with record labels as well as those operating independently are members of the RiSA and enjoy the benefits provided by this umbrella body. According to the International Federation of the Phonographic Industry (IFPI), majority of the 1500 new members of the RiSA are artists that release their own material (IFPI, 2014). These musicians are the potential study respondents and are the units of analysis that constituted the population for the study. However, it is not limited to RiSA members as, nowadays, musicians operate independently as music entrepreneurs in the industry. This is evident in *The Future Sounds of Mzansi* (Mathambo and Rasethaba, 2014), a contemporary South African music documentary that examines musicians and their entrepreneurial experiences in the music industry in the three major cities of Durban, Johannesburg and Cape Town.

1.2 Background of the Study

Globalisation and changing customer demand places new pressures on supply chains. The Internet and electronic commerce (e-commerce) has changed the way business is conducted. Nieman, Hough and Nieuwenhuizen (2009:329) observe that the Internet and e-commerce not only create new opportunities for major companies in SA, but have the potential to develop entrepreneurs. Bidorbuy.co.za, Action Gear, Takealot.com, and Loot are leading South African online businesses that offer a cost-effective medium for local and international delivery of a wide range of products to consumers (Thomas, 2015:2). Nieman *et al.*, 2009; and Simchi-Levi, Kaminsky and Simchi-Levi, 2009 observe that the main advantage of e-commerce is that it decreases the cost of creating, processing, distributing and retrieving paper-based information. Furthermore, supply chain inefficiencies such as large amounts of inventory and delays in deliveries are minimised or become obsolete.

Ramkissoon (2012a:1) notes 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 can't pronounce can now be downloaded by someone who can make them famous by the click of a button." In acknowledgement of the growth of digital distribution of music, Apple launched its South African iTunes online music store in 2012 which opened a major window of opportunity for local music (Ramkissoon, 2102b:1). Known for its repertoire of music from all major recording labels and numerous independent labels, the iTunes store currently includes musicians such as Arno Carstens, Zulu Boy, Thandiswa, Simphiwe Dana, Stimela, Lucky Dube, Toya Delazy and Idol winners, Khaya Mthetwa and Zahara.

Studies conducted from 1999 to 2013 by the authors listed in Table 1.1 illustrate that the Internet has changed the way in which music and other digital goods are distributed.

Table 1.1: Sources on Digital Distribution of Goods, 1999 to 2013

Author	Year	Topic
Alves	2004	Digital distribution music services and the demise of the traditional music industry: three case studies on Mp3.com, Napster and Kazaa
Bielas	2013	The rise and fall of record labels
Bockstedt, Kaufman and Riggins	2005	The move to artist-led online music distribution: Explaining structural changes in the digital music market
Chircu and Kaufman	1999	Strategies for Internet Middlemen in the Intermediation/Disintermediation/ Reintermediation Cycle
Gallaugher	2002	E-commerce and the undulating distribution channel
Graham, Burnes, Lewis, and Langer	2004	The transformation of the music industry supply chain: A major label perspective
Hracs	2012	A Creative Industry in Transition: The Rise of Digitally Driven Independent Music Production
Klym	2005	Digital Music Distribution
Lam and Tan	2001	The Internet is changing the music industry
Macedonia	2000	Distributed file sharing: barbarians at the gates?
McIntyre	2009	Diminishing varieties of active and creative retail experience: The end of the music shop?
Zetner	2008	Online sales, Internet use, file sharing, and the decline of retail music speciality stores

Source: Developed by the researcher from literature reviewed.

While this can be attributed to broader shifts in social and economic structures (Byam and Burnett, 2009), the ownership and control of this digital content within supply chain distribution is a significant factor (Pietila, 2009:1). This study examines the extent of this trend of online music channels, the distribution strategies employed by record companies and musicians to cope with these changes, as well as the challenges experienced in this transitional journey.

1.3 Problem Statement

The music industry experienced significant transformation at the end of the twentieth century as a result of new technological development as well as the use of the Internet as a music distribution channel. Increased demand coupled with increased responsiveness provides opportunities for growth through improved distribution. The electronic supply chain systems has caused customers to migrate from physical product offerings within music, gaming and movie catalogues to digital downloading platforms; and offers consumers access to digitalised music distribution and quasi-real-time consumption. Electronic supply chain emanates from the broader e-business and includes the Internet by definition.

While technological innovations have enhanced the digital distribution of music on the Internet, distribution systems have become a challenge within the supply chain network. This study therefore aims to determine the implications of the paradigm shift in supply chain music distribution from analogue to digital by gathering information on musicians' perceptions of this transition and how it has affected the musician and the industry.

1.4 Research Questions

- What challenges influence the supply chain distribution transition from analogue to digital?
- What are the relative effects of operational processes and market demand in digitalised music distribution?
- How do the supply chain value adding innovations influence digital music distribution and consumption in the recording industry?
- To what extent does technological viability enhance supply chain distribution competitiveness?
- To what extent does the magnitude of supply chain competence and capability respond to digital supply chain music distribution?

1.5 Research Objectives

This study aims:

- To explore the challenges confronting the supply chain distribution transition from analogue – brick and mortar – to digital music distribution systems.
- To examine the distribution operations processes for the digitalisation of music in relation to the effects of global market demand.
- To evaluate the effects of supply chain value adding innovations in influencing digitalised music distribution and consumption in the recording industry.
- To establish the extent of technological viability to which the Diffusion of Innovation theory enhances supply chain distribution competitiveness.
- To assess the relative magnitude of the supply chain competence and capability response to digital supply chain music distribution.

1.6 Literature Review

The literature review examines the RiSA's structure, identifies the prominent players in the industry, and a view of digital and physical music sales statistics provided by the RiSA and the IFPI. This is followed by a brief overview of traditional supply chain practices prior to focusing on digital distribution. Research texts, journal articles, peer-reviewed articles and textbooks provided the data for the literature review.

1.6.1 Background of the Problem

World-renowned pop singer Kelly Clarkson's first album sold over four million copies in 2009. Two years later, 12 million copies of her second album were sold. However sales of the third album reached only two million. A few years later, four songs were stolen off her fourth album prior to release and released by a hacker on the Internet (Terry, 2009:1). This demonstrates the threat posed by the Internet to musicians, film makers, gaming developers and computer software. While this might be regarded as the normal quirks of show business, for a supply chain professional however, this trend alters traditional approaches to business by changing traditional supply chain management. The supply chain is tested in terms of its capability in adapting to lean and agile systems whilst at the same time, the ability to respond to the changes in the market and industry, will determine its competency.

The digital distribution of music has its origins in unauthorised file sharing in the late 1990s. Recent developments in digitally compatible audio formats, such as the Apple iPod, the Samsung Soundbar and the Dell Jukebox demonstrate the ever-increasing popularity, drive and demand for media player formats. This has revolutionised the way that music is made available and shared; one can now have a party and celebrate with friends just about anywhere as long as one has a phone or iPod in one's pocket.

According to Lam and Tan (2001:63), and the Recording Industry Association of America (RIAA) in 2008 Internet-based sales in the United States of America (USA) reached $500 million for compacts discs (CDs) and digital downloads. Napster, one of the earliest peer-to-peer file sharing service providers, has more than 80 million registered users. At the height of its success, there were 250 000 downloads of Napster's software indicating that the average user has access to approximately 220 songs (Lam and Tan, 2001:63). The company reached its peak between June 1999 and July 2001 (Lam and Tan, 2001:63). The IFPI which ranks countries by their contribution to global music trade revenue (Vermeulen, 2014:2) rates the World Top 10 music markets since 2009 as follows:

Table 1.2: World's Top Ranked Music Markets

Rankings	2009	2010	2011	2012	2013
1	United States	Japan	United States	United States	United States
2	Japan	United States	Japan	Japan	Japan
3	Germany	Germany	Germany	United Kingdom	Germany
4	United Kingdom	United Kingdom	United Kingdom	Germany	United Kingdom
5	France	France	France	France	France
6	Australia	Australia	Australia	Australia	Australia
7	Canada	Canada	Canada	Canada	Canada
8	Netherlands	Netherlands	Netherlands	Brazil	Italy
9	Italy	Italy	Italy	Italy	Brazil
10	Spain	Brazil	Brazil	South Korea	South Korea

Source: International Federation of the Phonographic Industry (IFPI). (2014) *IFPI Digital Music Report 2014 Industry Report*. London: International Federation of the Phonographic Industry.

Until 2007, South Africa (SA) showed a steady increase in music revenue (Vermeulen, 2014:2). By 2009 SA was at number 16 in the world rankings, moving up two places to 14th out of 51 countries in 2010. Preceding 2010, SA had been climbing the world rankings physical format sales chart (Vermeulen, 2014:2). However in 2011, SA moved six places down to the number 20 spot. Smirke (2014:2) notes that while the adoption of digital and streaming services is helping to drive growth in countries like Argentina and South Korea; other countries like SA, Brazil and Mexico have experienced falling revenue from music sales. Smirke (2014:2) adds that sales in SA, the continent's leading music market, slipped by 11.7% to $63 million in 2013. The IFPI (2014); and Vermeulen (2014) report that in 2010 digital music accounted for 29% of global music sales; while in 2013 SA's was ranked 17th for physical format sales and 26th in the overall world rankings.

Bizcommunity (2011:1) quotes the managing director of Musica that noted that Musica's CD sales dropped from 61% to 48% of its R896 million turnover in 2011. While there has been an increased appetite for music consumption, physical product sales have declined since 2006 (Bizcommunity, 2011:1). Despite Musica's single highest turnover being attributed to CDs, it has extended its product range to digital video discs (DVDs), video games, books, and other merchandise to make up for the loss of sales.

The impact of the Internet on digital supply chain music distribution has facilitated consumer access. Websites offer paid for and/or free services for the download of single tracks, re-mixed tracks and full albums. In the case of iTunes, the App stores available on their branded products like the iPhone, iPad, iPod and Macs provide for flexible modular storage of music files, together with excellent marketing of the complementary technologies. Consumers now utilise the services of GCloud and iCloud to access music, which is uploaded from their PCs, laptops, Tablets and cellular phones at any time. With this in mind, it is necessary for South African musicians to adapt to these new markets in order to survive.

There is limited research on digital music distribution in the South African context. Pietila's (2009) article, "Whose Works And What Kinds Of Rewards: The persisting question of ownership and control in the South African and global music industry" focussed on digital rights management, ownership and copyright laws in the industry. However, a considerable number of international studies have been conducted since the 1990s to address transformation of the traditional ways of doing business in the retail sector. In the modern business world, companies are called on to change the way they do business, by providing better quality, more accessible services.

1.6.2 The South African Music Industry

South Africa's music industry is the most developed in the African continent (IFPI, 2014). The international music industry is dominated by five multinational companies, namely, EMI, Sony, Universal-Vivendi, Time Warner and Bertelsmann (BMG) that control the production and distribution of recorded music (Graham *et al.*, 2004:1087). Four of these companies have subsidiaries in South Africa and held 77% of the market share in 2009 (Pietila, 2009). Bernardo and Martins (2013:5) put this percentage at more than 80%. This network enables South African music to be sold in national and international markets.

Table 1.3: South Africa's Recorded Music Market Share in 2009

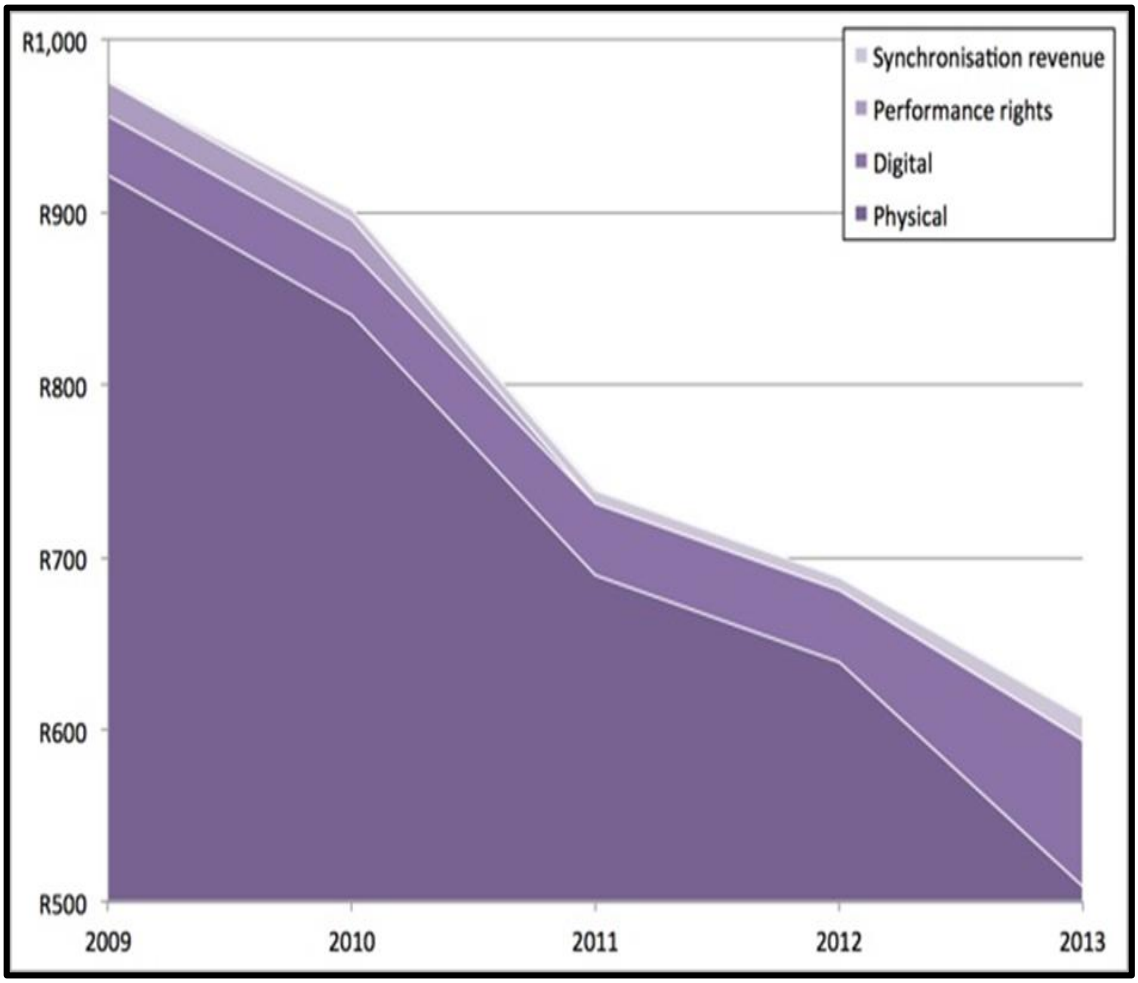
Company	Percentage Share
EMI	18.0%
Sony	23.8%
Universal	20.0%
Warner Music Gallo Africa	15.3%
Others (Independent)	22.9%

Source: Informa UK. (2010) The international business newsletter of global music copyright. [online], available: http://www.informatm.com/pdf/Nov-2006/10/m_c331_110806.pdf [3 May 2014].

Vermeulen's (2014:1-4) analysis of the IFPI's Recording Industry in Numbers 2014 (IFPI, 2014) report, noted that sales of recorded music in physical formats in SA are shrinking faster than the observed global decline. While there is strong growth in digital music sales in the country, the Recording Industry's report showed that it was insufficient to offset the decline in physical format sales from 2009 to 2014. In 2009, CD sales that constitute the largest portion of physical recorded media in SA amounted to 17.1 million and decreased from 15.9 million units in 2012 to 12.2 million in 2013. On the international front, overall music sales decreased by 4% from 2012 to 2013 while in SA, combined music sales decreased by 12%.

Figure 1.1 illustrates the dramatic decrease in music sales trade revenues in SA from 2009 to 2013.

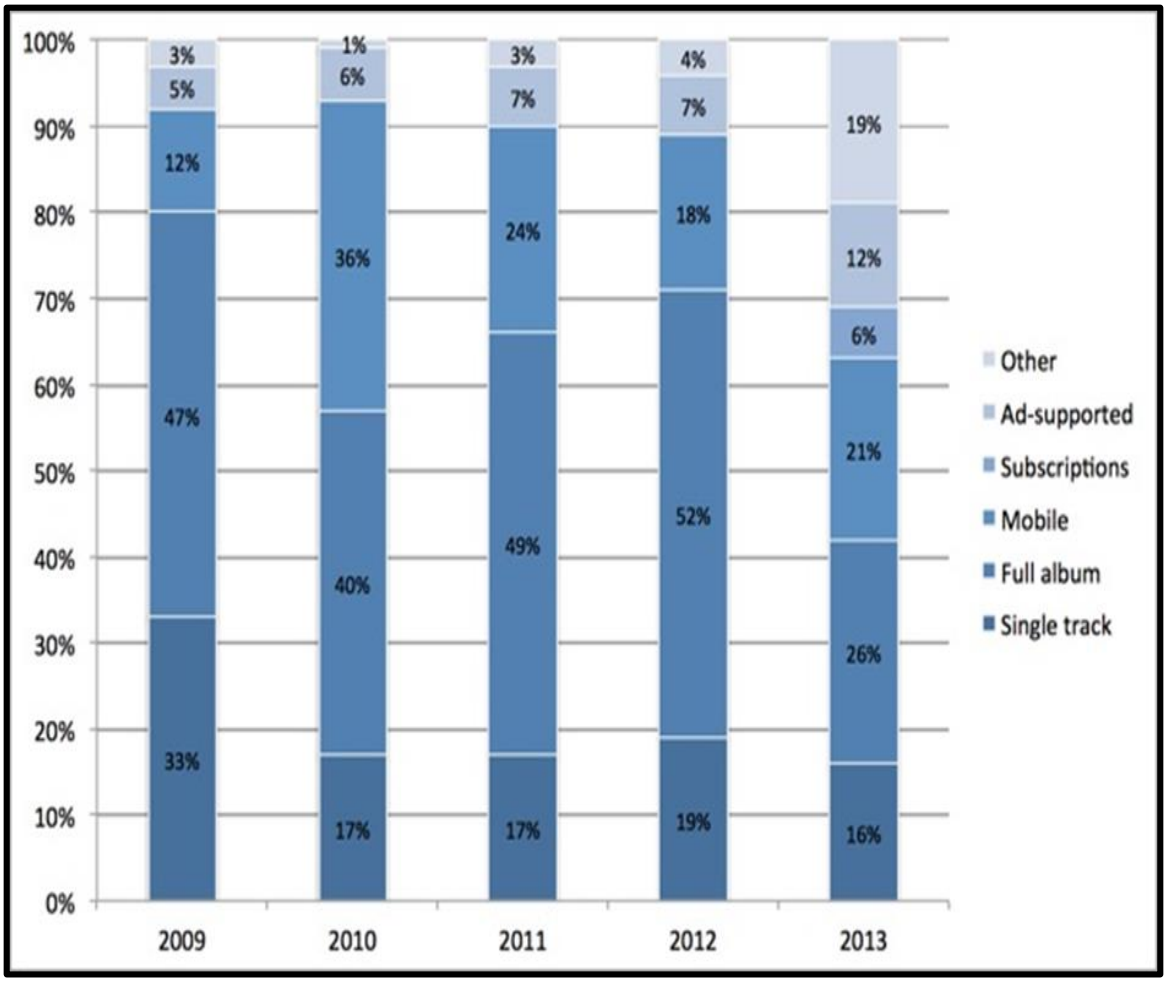
Figure 1.1: Music Sales in South Africa by Format from 2009 – 2013



Source: International Federation of the Phonographic Industry (IFPI). (2014) *IFPI Digital Music Report 2014*. Industry Report, London: International Federation of the Phonographic Industry; Vermeulen, J. (2014) *Music sales tanking in South Africa*. [online], available: http://mybroadband.co.za/news/internet/104009-music-sales-tanking-in-sa.html [24 October 2014].

The Recording Industry in Numbers Report (IFPI, 2014); and Vermeulen (2014:2) provide a breakdown of digital sales by format. South Africa's digital sales growth from 2013 to 2014 was 106.8%. Figure 1.2 illustrates how the country's digital music landscape has changed since 2013.

Figure 1.2: Digital Music Sales' Market Share in South Africa from 2009 – 2013



Source: International Federation of the Phonographic Industry (IFPI). (2014) *IFPI Digital Music Report 2014*. Industry Report, London: International Federation of the Phonographic Industry; Vermeulen, J. (2014) *Music sales tanking in South Africa*. [online], available: http://mybroadband.co.za/news/internet/104009-music-sales-tanking-in-sa.html [24 October 2014].

The IFPI (2014); and Vermeulen's (2014:2) analysis of sales reflect that digital sales increased from 4% in 2102 to 19% in 2013. Ad-supported revenues increased from 7% to 12%, while mobile increased from 18% to 21%. Subscription services like iTunes, Simfy and Deezer entered the market and constitute 6% of total digital sales. Music streaming services have increased since iTunes became the first legal, paying streaming service provider to penetrate the South African market in 2012. Knopper (2014:1) observes that while digital music sales saved the record industry after years of piracy in the past, it recently took a dive due to the increase in

the number of streaming services, including Youtube and Spotify which costs South Africans a R100 per month. On the other hand, Suede (2014:1-2) commented that while, internationally the music industry broke the 12-year losing streak which lasted from late 1999 to 2012 by increasing sales by 0.3%, equivalent to $16.5 billion, music sales in South Africa are very poor and have been for many years. Suede (2014:2) attributes this to the possibility that artists, labels and retailers are not fully disclosing actual sales figures. As the music industry moves from physical format products to downloads and streaming services, the re-introduction of retro vinyls resulted in sales increasing to 33% in 2013 (Knopper, 2014:2). The ranking of the world music markets clearly indicate a decrease in physical format music sales in SA and an increase in digital music sales.

1.6.2.1 The Recording Industry of South Africa (RiSA)

The RiSA, previously known as the Association of the South African Music Industry (ASAMI) and established in 1970, is a trade association that represents the collective interests of producers of musical sound recordings and major and independent record labels in South Africa (RiSA, 2014). The association has approximately 2000 members, including four record labels, Sony Music, Universal Music, EMI and Warner Bros. Records (part of Gallo Records) (Pietila, 2009). The RiSA is responsible for the South African Music Awards (SAMAs) and certifies album sales (RiSA, 2014).

While various rules and procedures govern membership of the RiSA, in practice, applicants (any record company) are not rejected. No current member has been expelled from the organisation. Furthermore, the RiSA is committed to accommodating diversity within its ranks and structures.

According to the RiSA website (2014) the South African Copyright Act of 1978 states that, “You may not make a copy of a sound recording without the permission of the author.” This is interpreted to mean that it is illegal to covert a CD to MP3 in SA. However, legal proceedings have never been instituted against a party in SA who converted a CD to MP3 format for personal and private use. To protect the rights of members, RiSA offers the following benefits:

Benefits of RiSA membership
• Members benefit from the RiSA's multi-faceted activities, including being part of a body that actively investigates and then supports or opposes legislation and other measures affecting the industry at large.
• Members have access to the organisation's vast information and insight into the state of the South African, African and global industry, new developments, trends and statistics.
• Members benefit from the activities of the RiSA's Anti-Piracy Unit (RAPU). The RAPU was established in 2006. It is housed at RiSA's secretariat in Johannesburg and is staffed by extensively and stringently trained ex-Police officials. RAPU is only permitted to conduct investigations on behalf of members and in regard to counterfeit products (pirate products) that violate members' copyrights.
• The RiSA's members also benefit from agreements entered into with the National Organisation for Reproduction Rights in Music in Southern Africa (NORM) and the Southern African Music Rights Organisation (SAMRO).
• Members benefit from the royalties collected by the South African Music Performance Rights Association (SAMPRA). The SAMPRA is a national, non-governmental organisation that licences specific copyrights that vest in recording companies that are members of the RiSA to third parties. The copyrights in sound recordings provided for in the Copyright Act of 1978 and administered by SAMPRA, are the rights of communicating such recordings to the public, diffusing sound recordings and the broadcasting of sound recordings.
• Entering member/s' releases for the annual South African Music Awards at a preferential pace compared to non-members.

Source: South African Music Performance Rights Association (SAMPRA) (2014) SAMPRA website. [online], available: http://www.sampra.org.za/about [26 June 2014]; Recording Industry of South Africa (RISA) (2009) RISA. [online], available: http://www.risa.org.za/ [16 June 2014].

The RiSA is recognised by the IFPI as the official National Group for the Recording Industry in South Africa and it thus enjoys international recognition (RiSA, 2014). In summary, musicians are protected against piracy and the replication of their music and membership ensures that their music reaches wider audiences abroad.

1.6.3 Independent Recording Market

The independent music market is an extension of the music market, comprising of musicians and record labels' employees whom begin their own music label. The number of independent labels in the local market is growing (Pietila, 2009). The SA music sector is energetic, diverse and vibrant with music genres ranging from Rock, to Pop, Alternative, House, Kwaito, Afro-

pop, Afro-jazz, Jazz and Blues. Due to the challenges experienced by local musicians in distributing music abroad, diverse traditional genres have no qualms about recording and distributing independently. This practise has given rise to a high level of entrepreneurship in SA where the kwaito and rock genres have flourished due to musicians assuming control of the recording and production of their music. This has positively impacted national economic development and social exposure (IFPI, 2014).

1.6.4 Recording Industry in Numbers (RIN) 2014: South Africa – A market with long-term potential

According to the IFPI's Recording Industry in Numbers report released in 2014, SA is a challenging market. The reasons (IFPI, 2014) are as follows:

- While many emerging markets showed signs of growth, the value of South Africa's recorded music fell by 5.8% in 2012, thereby ending its status as a top 20 global market;
- South Africa is underperforming. As a major hub for repertoire creation with its music reflecting the diversity of its people and as a country that produces eclectic genres of musicians in English, Afrikaans and Zulu, South African musicians should be flexing their muscles in terms of music sales;
- A major problem is the limited development of the digital sector. Digital services accounted for 8% of record company revenues in 2012. Although iTunes entered the market in December 2012, South Africa's first streaming service, Simfy Africa, only commenced business in September 2012; and
- High data charges and low bandwidth are significant barriers to digital music growth. This creates a distinct digital divide with top end consumers enjoying connectivity equal to that of developed countries while those without digital access still listen to music on pirated discs.

Despite these concerns, the IFPI's National Group, RiSA's membership grew from 500 to 2000 in the past five years. Furthermore, many new members are artists who are releasing their own material. This global trend is due to the disintermediation of record labels; today's artists assume complete control or integrate their music from conception through to production (IFPI, 2014).

Chapter two provides a more detailed discussion on the ways in which local players are addressing the challenges noted above.

1.7 Conceptual Framework

1.7.1 Traditional Supply Chain Distribution Practices in the Music Industry versus Digital Distribution

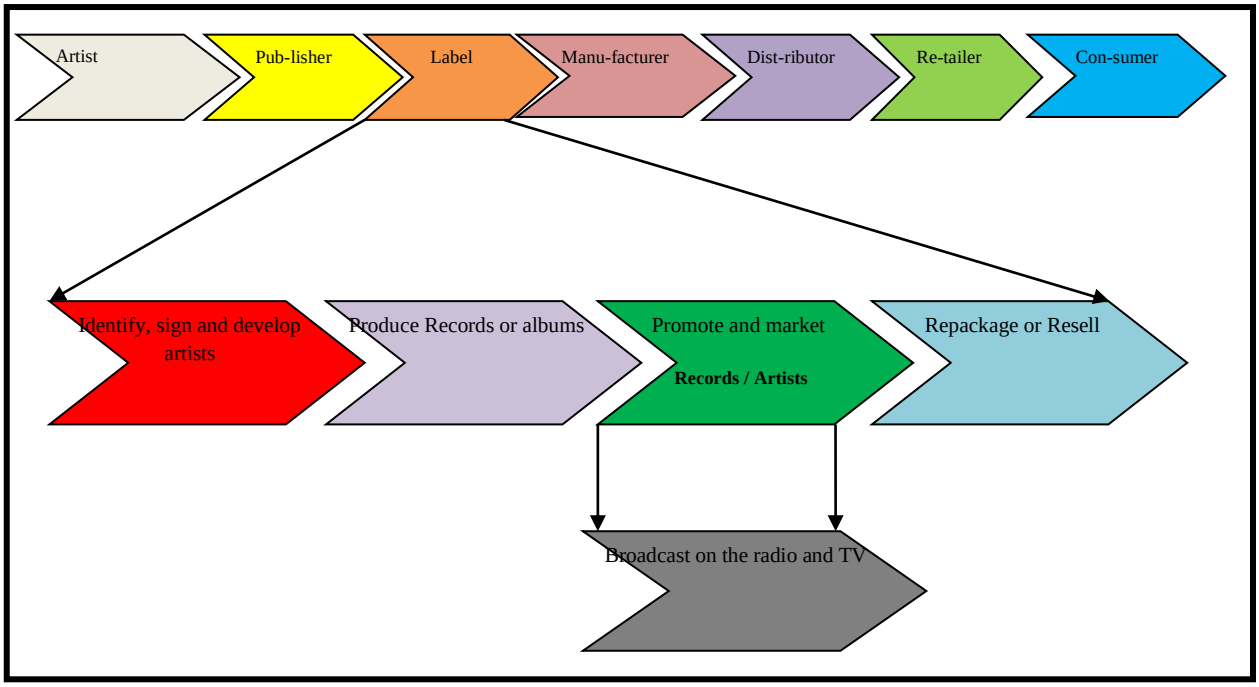
This study focused on the supply chain process of distribution in the music industry. Stevenson (2012:663) describes a supply chain as the internal and external sequence of organisations – their facilities, functions and activities – that are involved in producing and delivering a product or service. Simchi-Levi, Kaminsky and Simchi-Levi (2009); and Stevenson (2012) define supply chain management as a set of approaches used to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed in the right quantities, to the right locations, at the right time, in order to reduce system costs while satisfying service level agreements. The sequence begins with basic suppliers of raw materials and extends all the way to the final customer. Facilities include warehouses, factories, processing centres, distribution centres, retail outlets, and offices. Functions and activities include forecasting, purchasing, inventory management, information management, quality assurance, scheduling, production, distribution, delivery and customer service (Stevenson, 2012:664).

According to Kruger, De Wit and Ramdass (2007:583) distribution is the part of the supply chain that ensures that the finished goods reach the marketplace. Steyn (2005:61-76) outlines the five main traditional supply chain operational practices in the South African music industry:

- The manufacturing process (just-in-time manufacturing);
- Warehousing and distribution (receiving, picking, physical distribution);
- Sales and marketing (market push and pull incentives);
- Debt collection; and
- Management of receivables.

The diagram below depicts a traditional supply chain in the music industry with the facilities, functions and activities contributing to the supply chain management process.

Figure 1.3: Traditional Supply Chain in the Music Industry



Source: Adner, R. (2002) Online music battles: FullAudio vs. Pressplay. [online], available: http://faculty.insead.edu [7 July 2014].

This study focuses on distribution within the supply chain because the traditional supply chain practice of physical distribution disintegrates when organisations enter the sphere of electronic commerce (e-commerce) or electronic supply chains (e-supply chains). Traditional distribution dealt with the movement of physical products to stores as and when required. In the new e-commerce or digital era, physical products are replaced by digital products. In the music industry, a physical CD is replaced by a digital MP3 file and hence requires a new sphere of distribution. A more thorough discussion of the move from traditional to digital distribution follows in Chapter two with detailed diagrams.

Kruger *et al.* (2007:582) define e-commerce as a system that enables individuals or organisations to communicate electronically using electronic data interchange (EDI), file transfer protocol (FTP), systems network architecture (SNA), and the daily office duties of using a fax, e-mail and the Internet. E-commerce encompasses more than buying and selling on the Internet and entails electronically mediated transactions between an organisation and any third party, including non-financial transactions such as customer service and support (Chaffey, 2015:6). E-businesses connect people to information and applications; further evolution of software and the Internet will help to connect applications and business processes (Evans, 2003:20).

There can be no doubt that e-commerce has toppled traditional supply chain management practices and this revolution is creating excitement in industry. The *South African Ecommerce Awards* were held in October 2014. This is the ninth year that South African-based companies that facilitate the buying or selling of products via the Internet were recognised (eCommerce Awards, 2014). These awards are proof that there is growing acknowledgement of electronic businesses and their contribution to the South African economy.

1.8 Theoretical Framework

Researchers have identified three sources of opportunity for the advancement of innovation: technological change, political and regulatory change, and social and demographic change (Shane, 2014:73). The invention of the laser which created a platform for music to be stored on a CD in 1999 made it possible for music files to be ripped onto personal computers and thereafter uploaded to the Internet. Websites offered streaming music services that enabled consumers around the world to access a newly-released album.

This study employs the Diffusion of Innovation Theory developed by Rogers in 1962. The theory explains how as time goes by, an idea or product gains market share and spread in a specific population or social system. The end result of this diffusion is that people move away from traditional ways of doing things and adopt new ideas, behaviour or products. This means that the person does something differently from the usual way (i.e., the purchase or use digitalised music, acquiring and performing new behaviour, etc.). For the purpose of this study, five factors that influence adoption are used to understand how they influence the adoption of innovation or digitalised music in the recording industry. These are the five concepts of the theory to be used in this study (Tidd and Bessant, 2009:355-359):

- **Relative advantage:** the theory argues that the degree to which an innovation is seen - as better than the idea, programme, or product it replaces - makes it easy to adopt it.
- **Compatibility:** the theory argues that the innovation should be consistent with the values, experiences, and needs of potential adopters.
- **Complexity:** how difficult the innovation is to understand and/or use influences its adoption.
- **Trialability:** the theory argues that the extent to which the innovation can be tested or experimented with before the commitment to adopt makes it easy to adopt.
- **Observability:** the theory states that the extent to which the innovation provides tangible results makes it easy to adopt.

It is noted from Table 1.1 that the diffusion of innovation in the form digital music, has happened a long time ago. The theory of diffusion of innovation, which in this case refers to the diffusion of technology, has been accepted. Thus, this cross-sectional study examined the effects of digital music and the challenges it has posed to music industry. As such, the emphasis is the observability component of the theory in the supply chain and the influence it has on the supply chain system. Hence this study examined the meaning of the theory rather than the elements. This will pave the way for future research and a means of dealing with the challenges posed to the supply chain.

The Diffusion of Innovation Theory guided the sample size selected in the Durban area based on the supplemented spatial diffusion of innovation. According to Hypergeo (2004:1) the notion of spatial diffusion covers all the processes that contribute to movement, to migration inside geographical space and the reaction to the effects created in this space by the movers. This approach was first introduced in geography in 1952 by T. Hagerstrand, after extensive research has emphasised the existence of temporal and spatial regularities in the spatial diffusion of innovation. These studies noted that the larger the emitting centre (Durban), the higher its force of impulse in the diffusion process and therefore the noted descending course of diffusion of numerous innovations in urban networks. This study used spatial diffusion of innovation as a guide to sample selection.

1.9 Significance of the Study

This study is important in determining how musicians in Durban have been affected by the distribution of music as an online digital good. The growth of the Internet and e-commerce has created more exposure for artists. The study examines how the industry has been restructured in order to adapt to these changes, as well as the introduction of new distribution strategies and digital rights management which is not new in the market. However new turnaround value chain driven strategies may give artists more control of their products than previously and encourage music entrepreneurship. The research study is also valuable as it provides insight into the South African market to inform strategies for the supply chain of digital media products such as e-books.

1.10 Justification for the Research

Pietila (2009); and the IFPI (2014) note that the South African Music Industry consists of an eclectic mix of artists and bands from diverse music genres, some of which would normally be exclusive to our country or the regions where the audience resides. In order for talented local artists to gain broader exposure to international markets, it is necessary to adapt to the digital marketplace. Understanding how Durban artists distribute their digital music is the primary objective of this study.

1.11 Research Methodology

The type of research design that will be used in this study is exploratory. Sekaran and Bougie (2010:103); and Cooper and Schindler (2010:102) describe exploratory research as a study undertaken when insufficient knowledge or research is available on problems or research issues that have been dealt with in the past. This research design has been chosen to explore and better understand the subject of digital music distribution in the South African recording industry. Given the limited empirical and theoretical research on the South African music market, an exploratory design approach was appropriate.

This nature of the study is quantitative. The quantitative aspect serves to answer questions about the relationships among the variables that are measured, deriving meaning from the data that is analysed through use of statistics, diagrams and tables (Sekaran and Bougie, 2010:144). Hence, the source of data in this study will come from questionnaires. The time horizon for this study is cross-sectional since data will be collected at one point in time from all respondents. The target population for this study are musicians in the Durban region. Purposive sampling, together with snowballing will be used as part of non-probability sampling (Creswell, 2014:189). The sample size for this study is 152.

The data required for this research will be collected by means of questionnaires and interviews. The questionnaires will be set out in different ranges to best collect the data needed, namely using Likert scales and the use of dichotomous questions (Yes/No) as well as the need for ordinal scale.

Univariate data analysis will be used by to find the measures of central tendency and measures of dispersion (Wegner, 2007:98). The second scientific component will be bivariate data analysis. Bivariate analysis constitutes Pearson Correlation which gives the direction, strength and significance of the bivariate relationship among the variables in the study (Cooper and

Schindler, 2010:209). The second tool is cross tabulation that establishes a relationship between two variables. As part of multivariate data analysis, logistics regression will be used to predict the outcomes of the categorical data. Multiple regression analysis is employed to test the regressed effect of each variable. Reliability will be tested using Cronbach's Alpha which is used to test for consistency, dependability and trustworthy of all data collected (Wegner, 2007:5).

1.12 Ethical Considerations

Ethical clearance is obtained from the University of KwaZulu-Natal's Humanities and Social Sciences Research Ethics Committee before data collection proceeds. Questionnaires will then be administered to musicians in the Durban region. The researcher will remain objective, fair and impartial throughout the research study. All respondents will be assured of their anonymity and the confidentiality of the information they provide. They will also be informed that they have the right to withdraw from the research process. This protects the respondents and enhances the integrity of the research.

1.13 Limitations of the Research

The scope of this research study is limited to digital music distribution by Durban musicians. There is a diverse mixture of artists in the Durban area and the selection of participants may not have fully encompassed all talents and experiences. Furthermore, the study's scope is limited to Durban musicians who belong to labels, are independent artists and social music entrepreneurs in order to cover the eclectic mixture of artists. The transformation of music distribution led to the emergence of music entrepreneurs and it would be disadvantageous to exclude their experiences.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The Fraunhofer Institute of Germany developed an algorithm in 1991 that created a revolution in how music was distributed, stored and consumed. The algorithm known as codec, allowed the compression of digital audio to approximately a tenth of its original size without compromising its audio quality. The newly innovated format enabled information such as the song title and artist's name to be embedded in the file (Schilling, 2010:183). By 1995 software programs were available that enabled consumers to convert music tracks from physical product CDs to an MP3 (Moving Picture Experts Group Audio layer 3) format file (Alves, 2004:6). This codec allowed for the manipulation of music files, making them easier and more convenient to store and share. The MP3 file format became enormously popular, especially when it took off on the Internet. Music in this new format gained popularity when users started sharing their music online (Schilling, 2010:183). This fascinating evolution in the digital world indicates that the Internet created a new medium of music distribution which was easy to access and consumers had the option of either paying or obtaining the files free of charge.

The unauthorised use of file sharing had brought about significant changes in the music industry, specifically the digital distribution of music. As peer-to-peer digital music sharing grew, the digital music value chain emerged. It comprised of file sharing software, Internet connectivity, personal computers (PCs), jukebox software, portable MP3 players, and a volunteer community of users uploading and downloading digital content (Klym, 2005:1). The term 'peer' refers to a network-addressable computing element, like a personal computer, laptop, tablet and networked printer (Khambatti, Ryu and Dasgupta, 2003:1). Khambatti *et al*. (2003:1) define peer-to-peer systems as "distributed systems in which logically distinct computing elements called peers that have comparable roles and responsibilities, communicate information, share or consume services and resources amongst each other". It was around this time that the transition in distribution occurred, challenging the traditional supply chain.

The Internet has changed traditional supply chain distribution in the music industry. The shrinking of music into MP3 formats lead to global sharing of digital music online. File sharing results in the disintermediation of record companies and retail stores. In a traditional supply chain, artists and consumers are directly involved and connected through retail stores. The advancement of the Internet created a disintermediation in record labels because consumers

were now able to retrieve MP3 music files directly from peer sharing websites and not through the traditional supply chain process from the record label cascading down to retail stores. As a result, stakeholders in the traditional supply chain became uncertain of their roles in the emerging digital distribution.

This aim of this research study is to explore the challenges confronting the supply chain distribution's transition from analogue – brick and mortar – to digital music distribution systems within the supply chain. Furthermore, this research sought to determine the interplay between technical, social, legal and economic dimensions with the intention of understanding how the traditional supply chain has changed.

2.2 Conceptual Framework

2.2.1 Traditional Supply Chain Distribution Practices in the Music Industry versus Digital Distribution

The supply chain process of distribution in the music industry, within the supply chain process, is the focus of this research. Stevenson (2012:663) describes a supply chain as the internal and external sequence of organisations – their facilities, functions and activities – that are involved in producing and delivering a product or service. Simchi-Levi, Kaminsky and Simchi-Levi (2009:1); and Stevenson (2012:664) define supply chain management as a set of approaches used to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed in the right quantities, to the right locations, at the right time, in order to reduce system costs while satisfying service level agreements. The sequence begins with basic suppliers of raw materials and extends all the way to the final customer. Facilities include warehouses, factories, processing centres, distribution centres, retail outlets, and offices. Functions and activities include forecasting, purchasing, inventory management, information management, quality assurance, scheduling, production, distribution, delivery and customer service (Stevenson, 2012:664).

According to Kruger *et al.* (2007:583) distribution is the part of the supply chain that ensures that the finished goods reach the marketplace. Steyn (2005:61-76) identifies the following five main traditional supply chain operational practices in the South African music industry:

- The manufacturing process (just-in-time manufacturing);
- Warehousing and distribution (receiving, picking, physical distribution);
- Sales and marketing (market push and pull incentives);
- Debt collection; and
- Management of receivables.

Discussion was diagrammatically explained in Chapter 1 as Figure 1.3 where extensive and depicts a traditional supply chain in the music industry with the facilities, function and activities contributing to the supply chain management process.

This research study focused on distribution within the supply chain because the traditional supply chain practice of physical distribution disintegrates when organisations enter the sphere of electronic commerce (e-commerce) or electronic supply chains (e-supply chains). Traditional distribution dealt with the movement of physical products to stores as and when required. In the new e-commerce or digital era, physical products are replaced by digital products. In the music industry, a physical CD is replaced by a digital MP3 file and hence requires a new sphere of distribution.

Kruger, De Wit and Ramdass (2007:582) define e-commerce as a system that enables individuals or organisations to communicate electronically using electronic data interchange (EDI), file transfer protocol (FTP), systems network architecture (SNA), and the daily office duties of using the fax, e-mail and the Internet. While it is generally considered to refer to buying and selling on the Internet on websites such as Takealot.com, e-commerce encompasses more than this and entails *all* electronically mediated transactions between an organisation and any third party, including non-financial transactions such as customer service and support (Chaffey, 2015:6). E-businesses help connect people to information and applications. Future evolution of software and the Internet will help to connect applications and business processes (Evans, 2003:20).

There can be no doubt that e-commerce has toppled traditional supply chain management practices and this revolution is creating excitement in industry and raising the bar. The *South African Ecommerce Awards* Were held in October 2014, the ninth year that excellence was recognised among South African based companies that facilitates the buying or selling of products via the Internet (eCommerce Awards, 2014). These awards are proof of the fact that there is growing concern acknowledgement of electronic businesses and their contribution to the South African economy.

2.3 Theoretical Framework

The increased growth of the Internet raises vital questions about how individuals decide whether and when to adopt an innovation, and how the innovation will be diffused among the population. According to Rangaswamy and Gupta (1999:1) the study of adoption behaviour

and the diffusion process for digital products is based on concepts and theories of individual decision making, and allows one to segment and profile customers based on the time of adoption and on their inclination to adopt an innovation. Traditionally these sectors were known as "innovators" or "early adopters" (Rangaswamy and Gupta, 1999; Shane, 2008). More important however, are the five founding characteristics of the theory of Diffusion of Innovation, as individual characteristics form the constructs of this research.

The Diffusion of Innovation theory seeks to explain how, why and at what rate new ideas and technology spread through cultures. Everett Rogers, a professor of communication studies, promoted the theory in *Diffusion of Innovations* in 1962 (Rangaswamy and Gupta 1999:1). Rogers's theory of Diffusion of Innovation is still used in contemporary research. He identified the five constructs or stages of adoption as awareness, interest, evaluation, trialability and observability. More recently, Tidd and Bessant (2009:355-359) identified the five characteristics as relative advantage, compatibility, complexity, trialability and observability. These are the five concepts of the theory to be used in this study (Tidd and Bessant, 2009:355-359):

- **Relative advantage:** the theory argues that the degree to which an innovation is seen - as better than the idea, programme, or product it replaces - makes it easy to adopt it;
- **Compatibility:** the theory argues that the innovation should be consistent with the values, experiences, and needs of potential adopters;
- **Complexity:** how difficult the innovation is to understand and/or use influences its adoption;
- **Trialability:** the theory argues that the extent to which the innovation can be tested or experimented with before the commitment to adopt makes it easy to adopt; and
- **Observability:** the theory states that the extent to which the innovation provides tangible results makes it easy to adopt.

As previously noted from Chapter 1, Table 1.1 it is evident that the diffusion of innovation in the form digital music occurred a long time ago. The theory of diffusion of innovation, which in this case refers to the diffusion of technology, has been accepted. Thus, this cross-sectional study examined the effects of digital music and the challenges it has posed to music industry. As such, the emphasis is the observability component of the theory in the supply chain and the influence it has on the supply chain system. Hence this study examined the meaning of the theory rather than the elements. This will pave the way for future research and a means of dealing with the challenges posed to the supply chain.

The focus of the study is on adopting technology in the diffusion of a digital innovation in the music industry. While the digital distribution of music is not a new concept, it has evolved tremendously in the 21st century. It is noted that the digital environment can influence both adoption behaviour and the diffusion process in significant ways. In such instances, the environment can alter the quality and quantity of information that potential adopters use in deciding whether and when to adopt an innovation (Rangaswamy and Gupta, 1999:2).

Contemporary researchers that apply the Diffusion of Innovation theory are found in the field of social media, more specifically the adoption of Twitter Hashtag (Chang, 2010); mobile banking technology adoption (Al-Jabri and Sohail, 2012); the radio broadcasting industry (Rossman, 2012) and the adoption and diffusion of innovation in conventional industries (Castellano, Ivanova, Adnane, Safraou, and Schiavone, 2013). The digital environment facilitates both word-of-mouth and market-controlled communication, thus directly impacting the diffusion of digital music and complementary technologies; hence the innovation of new ideas and products.

2.4 Distribution in the Music Industry

The traditional music supply chain has undergone transformation from the times when brick-and-mortar processes were sequential in nature. Artists disseminated their music to record companies who then sold the music to consumers through physical retail stores. In past years, a vigorous new digital environment has emerged to facilitate and support market changes. The Internet is the most visible manifestation and has transformed the way in which people purchase music (Alves, 2004). The creation of MP3 format digital music files has allowed distributors to sell music on the Internet. The digital environment contains a wide range of computer and communication technologies which when combined, facilitate communication and transactions between buyers and sellers (Rangaswamy and Gupta, 1999), thus supporting non-physical or digital product purchasing.

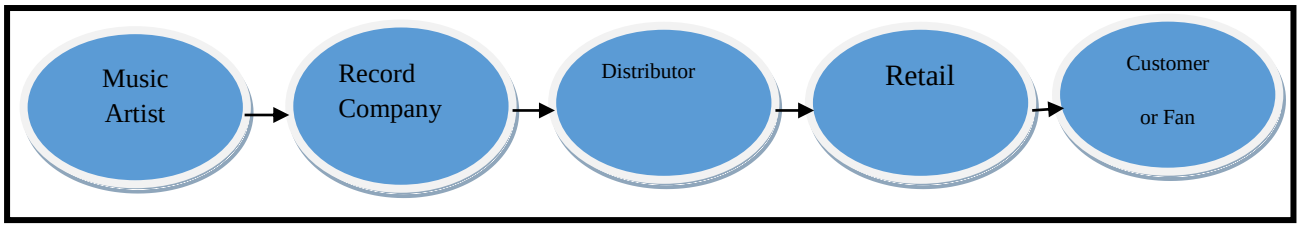
This section examines the traditional supply chain music industry structure, the role of the Internet as a new distribution strategy and the disintermediation of the traditional supply chain and possible re-intermediation of a virtual supply chain structure.

2.4.1 Traditional Music Distribution in an Intermediate Supply Chain

Internationally, supply chains can be described as a sequential series of linked suppliers and customers (who can be termed links, actors, or players); whereas chains are commonly

portrayed as simple linear processes (Graham *et al.*, 2004). The traditional music supply chain is depicted below:

Figure 2.1: Traditional Music Value/ Supply Chain



Source: Bernardo, F. and Martins, L.G. (2013) *Disintermediation effects in the music business – A return to old times?* [online], available: https://musicbusinessresearch.files.wordpress.com/2013/06/bernardo_desintermediation-effects-in-the-music-business.pdf [2 December 2014]: pp. 1-20.

The music industry's supply chain starts with the composers and performers that create and write the lyrics and perform the music. The musician holds the rights of the song in all forms of its interpretation. The publisher acts as a proxy, collecting the royalties due to the artists. The next step in the supply chain is the record labels that are the primary driving force of the music industry. According to Adner (2002:5-6) labels are responsible for discovering new talent and introducing it to the market; and managing the back catalogue of their established artists. The main activities of a label are tabulated below:

Table 2.1: Main Activities of Key Stakeholders in the Music Industry

Stakeholder	Main Activities
Artist and repertoire	Matching artists with songs
Marketing	The overall promotions and marketing concepts to market an artist
Promotion	Pushing records on radios and TVs and promoting artists through public relations
Sales	The sale of compact discs in retail stores

Source: Adner, R. (2002) *Online music battles: FullAudio vs. Pressplay*, [online], available:http://faculty.insead.edu/adner/PREVIOUS/Projects%20May/Online%20music%20Final.pdf [7 July 2014]; Stensrud, B. (2014) *Thoughts on the supply chain for Recorded Music*, [online], available: http://businessofclassicalmusic.blogspot.com/2008/12/thoughts-on-supply-chain-for-recorded.html [9 July 2014]: p. 2.

The international music industry is dominated by five multinational companies, namely, EMI, Sony, Universal-Vivendi, Time Warner and Bertelsmann (BMG) who control the production and distribution of recorded music (Graham *et al*., 2004; Pietila, 2009). Four of these companies have subsidiaries in South Africa and held 77% of the market share in 2009 (Pietila, 2009). These labels facilitate the sale of South African music in national and international markets. The rest of the market is crowded by independent labels often operating with a local catalogue.

The next step in the supply chain is the manufacturing process where the CD is manufactured as well as the packaging or sleeve design and inserted into the disc cover. The distributor runs the physical distribution of CDs in bulk from the record labels and warehouses and ships them on demand to retail outlets or directly to consumers. This indicates a centralised distribution system with a push supply chain. Bowersox, Closs, Cooper and Bowersox (2013:43-44) describe a centralised or direct distribution system as the shipping of products directly to the customer's destination from a single or a limited number of centrally located inventories or warehouses. Direct distribution uses the services of premium transport combined with information technology to rapidly process customer orders and achieve delivery performance (Bowersox *et al.,* 2013:43). Retailers, which include supermarkets, live music venues and large-scale record stores, place the physical product on their shelves and sell it directly to customers. The consumer purchases the CD at a retail outlet and also listens to music broadcast on radio and television.

Each player in the supply chain brings a unique combination of capabilities that integrate to improve the performance of the supply chain by developing seamless linkages between the various players (USAID, 2011:1). Within the supply chain, upstream suppliers provide inputs. The company then adds value to these inputs before passing them downstream to the next actor which can be another organisation or the end consumer. In this way, the money obtained from the consumer flows back through the supply chain to provide the financial returns required by each component of the supply chain, thereby making the system economically viable (Graham *et al.*, 2004; USAID, 2011).

Technology and the internet however have spawned three related disruptions which have undermined the financial viability of the traditional supply chain. Stensrud (2014:2) identifies these as:

- Internet retailers (leading to global closure of retail music shops),
- Direct digital distribution (creating entrepreneurship); and
- Theft or piracy (leads to legalalised online stores like iTunes / Digital Rights Management).

These three disruptions are discussed below as they are inter-related and ultimately determine the future of distribution of music in the music industry.

2.4.2 The Disintermediation of the Traditional Distribution in the Supply Chain

The vice president of EMI stated that "the threat to the music industry is not MP3s, but the arrival of a consumer distribution channel that is not controlled by the music industry" (Lam and Tan, 2001:63). Alves (2004:6) concurs with Lam and Tan (2001:64) that peer-to-peer sharing across the Internet causes the disintermediation of record companies and retailers from the traditional supply chain and enables artists and consumers to be directly connected through websites and peer-to-peer sharing technology. It is important to emphasise that disintermediation occurs when online music websites such as MP3.com, Napster, eMusic, Rhapsody and the multitude of other online music stores provide free services for customers to download and upload digital music files from peer-sharing websites (Bernardo and Matins, 2013:4). Music is not only free, but is easier to acquire. This led to a significant decrease in album sales internationally and locally which ultimately resulted in the closure of retail music shops (Bielas, 2013; Look & Listen, 2014; McIntyre, 2009; Shevel, 2014; Stensrud, 2014; Warr and Goode, 2011).

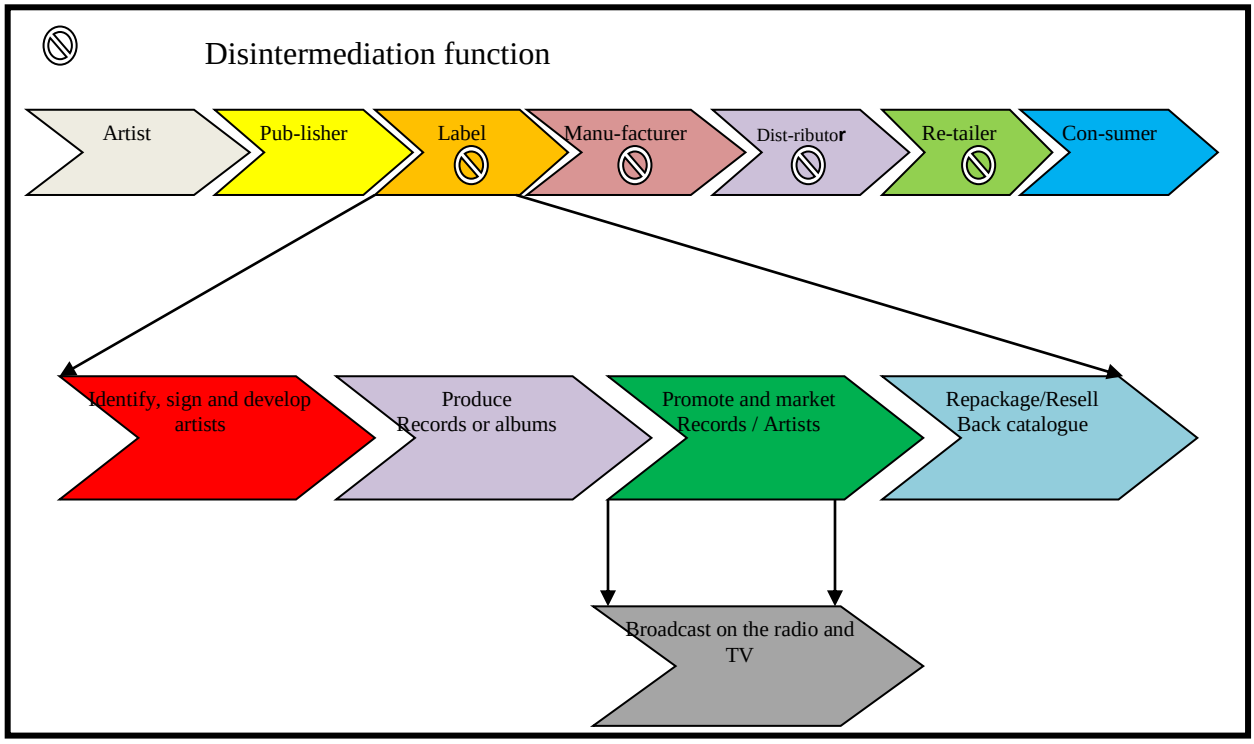
Bernardo and Martins (2013:3) explain that in economics, an intermediary is a third party that offers intermediation services between two trading parties, namely a supplier and a consumer. Chircu and Kaufman (1999) describe disintermediation as "the removal of intermediaries in a supply chain, or the cutting out of the middlemen". Instead of going through traditional distribution channels, which had some type of intermediary (such as a distributor or wholesaler), artists can now deal with every customer directly the Internet. Chircu and Kaufman (1999) point out that the decreased cost of servicing customers directly is an important factor associated with disintermediation. Disintermediation is attributed to several factors, including the supplier's internal operation of activities traditionally performed by intermediaries (Sarkar, Butler and Steinfield, 2006:2), including the level of market transparency which leads to increased knowledge on the part of the buyer of the supply base pricing (Picot and Bortenlanger, 2006:107-123). On the other hand Benjamin and Wigand (1995:7) argue that in a global communication network, the ability to support direct exchange in an efficient manner will be beneficial to both the producer and the consumer. Manufacturers will gain surplus value or profits while consumers benefit from a more extensive catalogue at affordable prices.

According to Graham *et al.* (2004); Lam and Tan, (2001); and Whinston, Stahl and Choi (1997) the introduction of network technologies has the capability of transforming the supply chains of

many industries due to the abolition of the trade-off between richness and reach of information. The emergence of web technologies also enables new forms of interaction between the players in the market (Bernardo and Martins, 2013:4). The authors elaborate that richness of information entails characteristics such as bandwidth, customisation, and interactivity. Thus the more specific the information is, the richer it becomes. Reach is defined as connectivity and refers to the number of people involved in exchanging information (Evans and Wurster, 2000:25). Before the arrival of the Internet, reaching large numbers of people with rich information was costly as well as time-consuming due to the fact that traditionally, information could only be transferred in the form of a physical tangible product such as a CD or book. The current reality afforded by the dot com era has granted access to networked global communication that encourages disintermediation given that the Internet allows consumers to purchase music directly from producers. Lam and Tan (2001:63) suggest that as bandwidth increases and more advanced compression techniques avail themselves, the Internet will become the major distribution channel of music in its digital format.

According to Statistics South Africa (2014) the majority of KZN's population has access to technology in the form of cellular phones, PCs, laptops, iPads, Notepads and the Internet, enabling the adoption of technologies. Hence, the richness of information is highly expected to reach the majority of the Durban population. Once music files were introduced in the MP3 format, with the ability to edit and alter the file in this format, it was easy for music to travel freely and reach consumers at different ends of the globe. Whilst the Internet facilitated the way in which music was accessed, at the same time it created a disruption in the way in which it was distributed. In some instance consumers were now perceived as being distributors themselves (Lam and Tan, 2001:63). The figure below diagrammatically illustrates disintermediation in the supply chain.

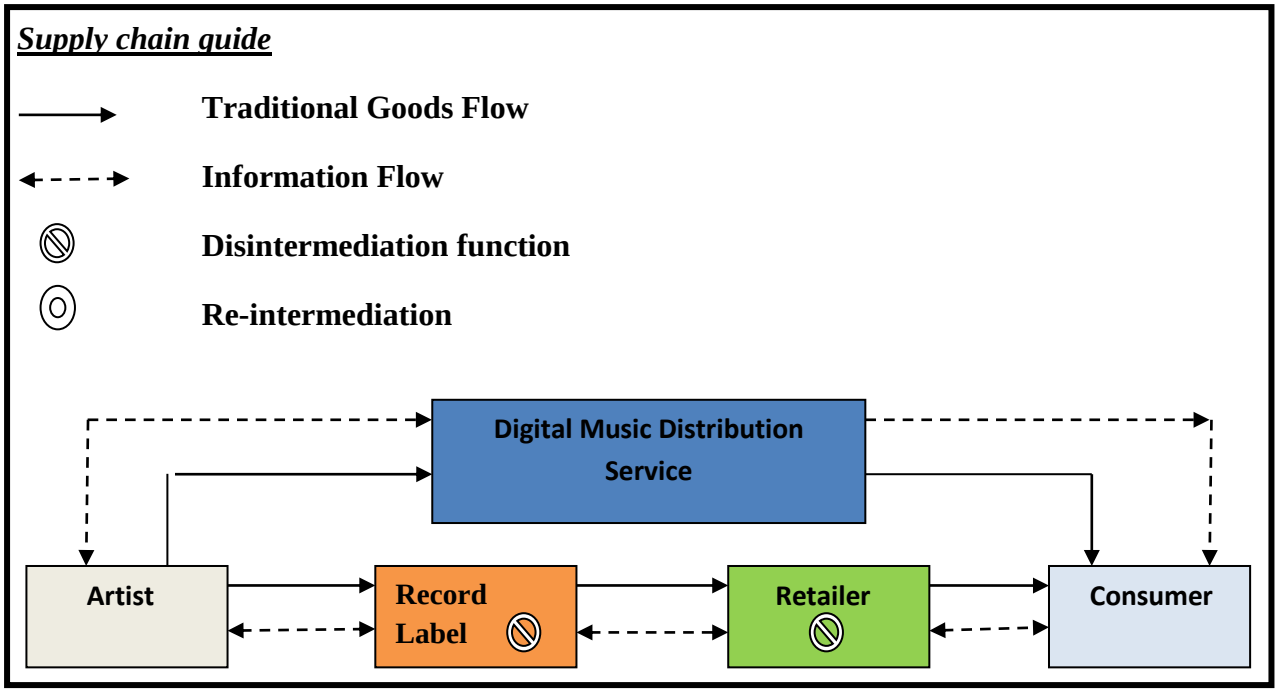
Figure 2.2: The Disintermediation of the Traditional Supply Chain in the Music Industry



Source: Adner, R. (2002) *Online music battles: FullAudio vs. Pressplay*, [online], available:http://faculty.insead.edu/adner/PREVIOUS/Projects%20May/Online%20music%20Final.pdf [7 July 2014]; Graham, G., Burnes, B., Lewis, G L., and Langer, J. (2004) The transformation of the music industry supply chain A major label perspective, *International Journal of Operations and Production Management*, 24(11): p. 1092.

The disintermediation of the industry's supply chain spawned a range of different digital music distribution service technologies that provided consumers with an alternative means of acquiring music. These services removed two previously vital intermediaries, namely the record labels and retailers. The figure below illustrates this phenomenon.

Figure 2.3: Disintermediation of the Record Label and the Retailer



Source: Alves, K. (2004) Digital distribution music services and the demise of the traditional music industry: three case studies on Mp3.com, Napster and Kazaa, [online], available: http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1008&context=thesesinfo [21 July 2014]: p. 127; Graham, G., Burnes, B., Lewis, G.L., and Langer, J. (2004) 'The transformation of the music industry supply chain A major label perspective', International Journal of Operations and Production Management, 24(11): p. 1092.

This enabled artists and consumers to be directly connected and share one another's music files, or through peer sharing web service sites. The peer-to-peer website sits in the middle facilitating the transfer of music files in a virtual repository (Alves, 2004).

2.4.3 Reintermediation in the Supply Chain

Reintermediation takes place when new intermediaries enter the digital platform or when there is a reintroduction of an intermediary between supplier and consumer (Chircu and Kauffman, 1999:110). Carr (2000:46-47) defines reintermediation as the reformulation, realignment and pruning of intermediaries but without total elimination. The dilemmas surrounding reintermediation occurred because of the issues associated with e-commerce activity and the resources required. Bernardo and Martins (2013:4) identify these as the development and maintenance of a website, maintaining product information, marketing expenses, the high cost

of small orders shipping, massive customer service and the typical issues arising from supply chain partners and from competing online.

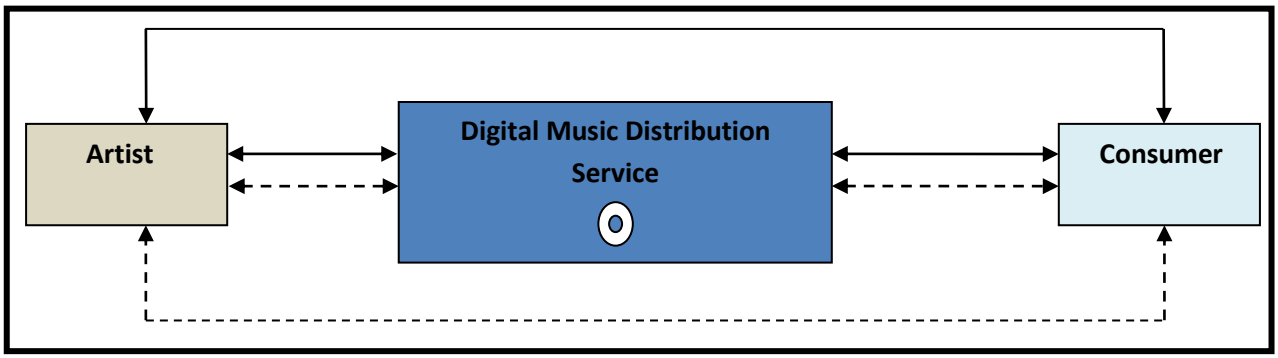
Chircu and Kauffman (1999:113) identify three processes in the changes taking place in the market as the intermediation, disintermediation and reintermediation (IDR) cycle. In addition, the said authors identify the four major competitive strategies used in the IDR cycle for intermediaries to achieve sustainable competitive advantage in the marketplace: partnering for access, technology licensing, partnering for content and partnering for application development.

2.4.3.1 Retailers became E-tailers

The first casualties of the disruption in the value chain resulting in the disintermediation of the record labels were physical retail stores. All three developments as identified by Stensrud (2014:2) note that Internet retailers, direct digital distribution, and piracy have resulted in a reduction in CD sales at music outlets undermining their financial viability. Stensrud (2014:2) adds that that thousands of local and international CD stores have closed their businesses and that those that remain are under tremendous financial pressure bordering close to bankruptcy. The decline in the number of physical retail stores seems to have driven significant numbers of South African customers to e-commerce businesses such as Amazon.com, Kalahari.net, Takealot.com and Loot.

Reintermediation is evident in the music industry with both traditional intermediaries reinventing themselves for the digital economy and the emergence of new players in the market. Online retailers in the newly-evolved supply chain are termed e-tailers, and the marketplace is now known as the marketspace (Alves, 2004:128). E-tailers experienced an initial boom based on their lower cost structure and the lack of physical inventory, but rather a virtual inventory. Bernardo and Martins (2013:10) identify intermediaries such as iTunes and eMusic as representatives of the intermediaries that replicate the physical distribution and ownership model. Adner (2002:13) notes that new intermediaries include Mp3.com, the new Naptser, Pressplay, MusicNet, FullAudio and Rhapsody. The figure below illustrates the reintermediation of the record label and the retailer. The most prominent and successful e-tailer in South Africa is iTunes which was launched in 2012 (Ramkissoon, 2012).

Figure 2.4: Reintermediation of the Record Label and the Retailer



Source: Alves, K. (2004) Digital distribution music services and the demise of the traditional music industry: three case studies on Mp3.com, Napster and Kazaa. [online], available: http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1008&context=thesesinfo [21 July 2014]: Pp. 127-129.

Greenburg (2012:54-58) notes that digital distribution led to the emergence of other intermediaries known as digital aggregators. Tunecore, The Orchard, CDbaby and INgrooves are service providers that make a catalogue of music available to consumers online and act as mobile retailers. INgrooves is the most successful digital distributor due to its business model. Artists or labels send digital recordings to INgrooves that uses its technological systems to convert the music files into high quality formats, and sold to e-tailers such as iTunes, Amazon.com and Spotify. The digital distributor then collects royalties from the e-tailers and gives a percentage to the artist.

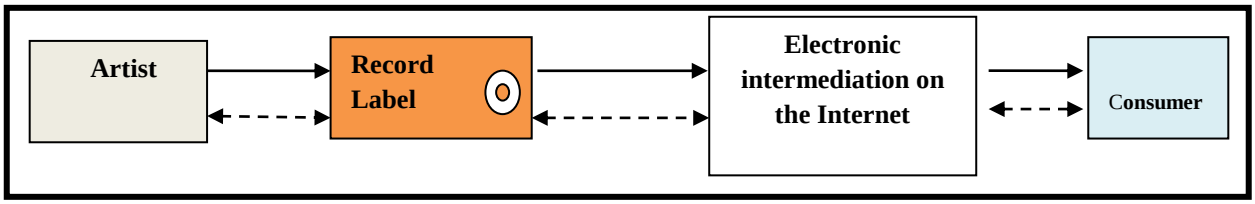
2.4.3.2 Distribution

In the United States of America, three distributors (Alliance, Baker and Ingram) account for 80% of CD sales (Stensrud, 2014:2). Four major record labels dominate the market in SA and have completely integrated their supply chain activities (Graham *et al*., 2004; Pietila, 2009). This implies that they did not outsource the distribution of CDs to retail stores to third parties, but performed these functions in-house. Steyn (2005:68 - 70) describes the RiSA's distribution structure as one of complete integration where the artist records the CD and thereafter it is stored in a warehouse and distributed to retail companies. Bernardo and Martins (2013:6) also note that the majority of record labels have developed efficient production, distribution and promotion systems both vertically and laterally. With disintermediation occurring at the record label, the function of distribution is naturally affected.

Alves (2004:92) examined reintermediation in three peer-to-peer file sharing companies and noted that record companies reacted to this transformation by closing online peer-sharing companies which were destroying their physical business, in an attempt to preserve the traditional supply chain. The websites include MP3.com, Napster and Kazaa; and attempts to close MP3.com and Napster were successful. Services offered by these two companies were shut down and bought by different record labels. This allowed for the re-intermediation of record labels online. Kazaa and other free digital music distribution services established a firmer online presence whilst online legal music retailers decided to use the opportunity to download rather than fight it (Giletti, 2012:31) in order to capture a share of the online music market. Apples iTunes dominated the legal paying market and has enabled the reintermediation of retailers or e-tailers online (Alves, 2004:129).

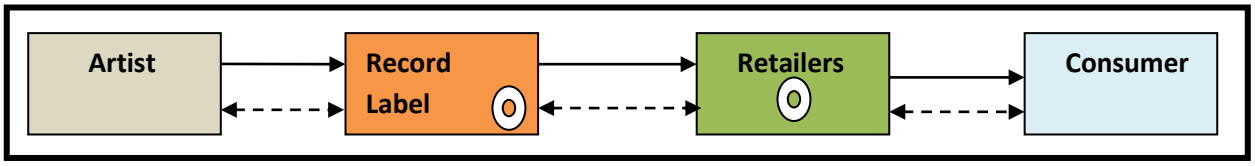
In line with Chircu and Kauffman's (1999:113) IDR cycle, Alves (2004:128) notes that the failure to close Kazaa led to record companies deciding to establish themselves online (see Figures 2.6 and 2.7). Some music labels offer their music free for customers to download and manipulate in order to develop a fan base. Record labels have re-established themselves in the supply chain through reintermediation. Furthermore, with the number of legal downloads increasing, "the music market seems set to experience future growth utilizing a supply chain that allows for multiple players to distribute music" (Alves, 2004:129). Whilst some record labels may still enjoy the usual benefits of the music industry in the newly established supply chain, technological developments have shown record labels that they need to allow other players to exist in order to satisfy customer needs.

Figure 2.5: Reintermediation of the Record Label Online



Source: Alves, K. (2004) Digital distribution music services and the demise of the traditional music industry: three case studies on Mp3.com, Napster and Kazaa. [online], available: http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1008&context=thesesinfo [21 July 2014]: Pp. 129.

Figure 2.6: Reintermediation of the Retailer to Become an E-tailer



Source: Alves, K. (2004) Digital distribution music services and the demise of the traditional music industry: three case studies on Mp3.com, Napster and Kazaa. [online], available: http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1008&context=thesesinfo [21 July 2014]: Pp. 129.

2.4.3.3 Piracy

People place their faith in legally purchased digital downloads. Apple dominates the legal downloading business with an average of 20 songs per iPod in 2006. The market concentration of record labels in the music industry has traditionally been linked to high entry barriers such as high production and distribution costs (Rayna and Striukova, 2010:3). Once the Internet allowed for the free exchange of information and file sharing, artists felt threatened because they no longer had control of their music as they did in a traditional supply chain. Consumers could buy a CD, rip it onto their computer and upload the album on a peer-sharing server thereby allowing the album to be downloaded free of charge from the site by millions of users around the world. In such a scenario, the artists will only record a single album sale, but globally, consumers have obtained the album at no cost through piracy.

One of the ways to restrict piracy and the theft of music is Digital Rights Management (DRM) and Intellectual Property Rights (IPR) as a means of protecting artists and labels respectively (Bernardo and Martins, 2013:7). DRM is concerned with protecting the copyright of music content. A DRM system protects content against copying and allows for the definition of rights to access it (Adner, 2002:8). In the USA, the Secure Digital Music Initiative (SDMI) was established in 1998 amongst content providers and electronic organisations as a set of standards for DRM and watermarking technologies. However, this failed due to feuds between artists and record labels.

Alves (2004:129) proposes that in order to protect the rights of artists, a partnership is urgently required between technology and the law to accommodate and satisfy the expectations of each of the stakeholders in the industry. Furthermore, the current paid and subscription services should be reshaped to fit the emerging digital marketplace and to support the rights of all

participants. Different views on technology and law often collide, as is evident in the offline and online music industry. Stensrud (2014:4-5); and the IFPI (2014) note that 95% of consumers' music files are derived from their personal collection of ripped CDs and illegal file trading networks. Technology makes modular storage possible in our homes and empties the spaces once occupied by DVDs, CDs, book and similar products which have been replaced by digital content.

According to Mkhize (2008); and RiSA (2014) piracy is a significant problem in SA as reflected in the following statistics:

- 40% of recorded music sales are illegal copies;
- The result is a substantial loss in revenue of approximately $70 million globally;
- The South African music industry blames piracy for the R14 million drop in sales of CDs and DVDs of local artists;
- Organised crime syndicates that have established premises where music and movies are pirated perceive piracy as "a victimless crime"; and
- There is high demand for cheap pirate copies.

Although there was a total growth of 2.4% in physical sales from R996 million in 2006 to R1 billion in 2007, sales of CDs by local artists decreased. At an international level, sales rose from R460 million to R499 million whilst local CD sales dropped from R339 million to R336 million (Mkhize, 2008:2). Mkhize (2008:2) notes that the RiSA attributes this to piracy and the rising costs of production; whilst a representative of the South African Revenue Service pointed out that custom officials confiscated pirated CDs and DVDs worth about R18.4 million. Getting music to the right people for distribution and better radio airplay of local artists will help increase local sales. It is clear that the disintermediation of the label in the supply chain process has consequences for artists' music being promoted through traditional means such as radio airplay and broadcasting. Although the RiSA established an Anti-Piracy Unit in 2006, the growth of illegal sales continues and peer-to-peer file sharing will likewise continue to grow (RiSA, 2014).

The restructuring of the music industry's supply chain demonstrates how technology facilitates reverse markets in which the definition of the different stakeholders or players' roles change. The Internet and digital music distribution technologies should allow consumers to take over the packaging and marketing of music, with online communities involved in the multiplication, broadcasting and distribution of digital music, which was once the sole preserve of artists and record companies.

2.4.4 The Future Impact of 3D Printing on the Music Industry

The most pressing question in the music industry at the moment is whether three-dimensional (3D) manufacturing will do to the industry what Napster has already done; in other words, cripple the industry (Hiscott, 2014:1). Fleming (2014:1) describes 3D printing as the process of making three dimensional solid objects from a digital file. This process is done using additive processes where an object is created by laying down successive layers of material until the entire object is complete. Molitch-Hou (2014:1) points out that although music is isolated to the realm of hearing and 3D printing is more of a tactile, visual entity; this technology has started to change music. Consumers will see how music is going to change by means of 3D printing. Alves (2004:130) comments that although technology impacts on consumers, it is also important to note that technology is shaped by consumer adoption and modification.

The introduction of 3-D printing will have additional ramifications for the music industry. Hip hop group Black Eyed Peas member, Will.i.am is the Chief Creative Officer at 3D Systems. He suggests that the future of live music, visual art, creator and consumer could peak in the format of 3D printing (Taylor, 2014:2). According to Rings and Niewiem (2014:1) 3D printing is fast moving beyond its current territory which is planning, prototyping, engineering and tooling by becoming familiar in custom categories such as medical implants built on the digital blueprint of an X-ray or CAT scan. The authors add that 3D printing will do more than merely expand custom designed products; it will transform and change what a manufacturer is. Like the music industry, manufacturing will be focused on selling a digital code (Rings and Niewiem, 2014; Taylor, 2014).

Molitch-Hou (2014:1) explains that although music is not a tangible object, it might seem that the combination of 3D printing and music is strained. Music is an auditory experience. However, numerous other areas of the music industry, including the material objects related to music, offer potential for 3D printing such as music merchandise at a concert or promotional venue. 3D printing will also eliminate out of stock scenarios and the printers that produce merchandise for concerts and stores will provide a much larger and more readily available inventory. Molitch-Hou (2014:1-9) note that 3D products have resulted in the following changes to physical products in the music industry:

- 3D printed records – The ownership of a physical copy of a product, like a vinyl, may have aesthetic appeal to some consumers and not to others;
- 3D printed instruments - is a new way to manufacture music instruments that offer numerous possibilities with aesthetic choices. Designers are able to embed 3D artwork

and designs into instruments and provide customisation and personalisation as per customer requests;

- Speakers and headphones – the creation of complex shapes and customising objects to individual users and uses extends from the individual playing the music to the person listening to it; and
- The visual arts – where 3D printing offers the consumer printed visual art that gives music a more tangible manifestation (Molitch-Hou, 2014:7-11).

Although in its infancy, 3D printing could create a new era of techno-modernism. The personal factory – the local 3D printing hub and desktop 3D printer – is one of the primary means by which individuals personalised production and consumption facilitate unique subjective interpretation of works and allows consumers to share their experience of the sensory experiences created by the artist and the musician (Molitch-Hou, 2014; Taylor, 2014). 3D printing provides the basis for the personalisation of products to reflect the consumer's individual tastes. This technology was introduced for the first time on screen by Dave Franco in the film *Bad Neighbours* (2014). The interaction of human and machine and the meeting point of the digital and the actual are common themes in this new installation and technology. 3D printing also creates more diversity in the types of products music fans can purchase and is not limited to traditional merchandise, thereby creating competitive advantage in the industry.

2.4.5 Responses to Digital Distribution

2.4.5.1 Musicians' Responses to Digital Distribution

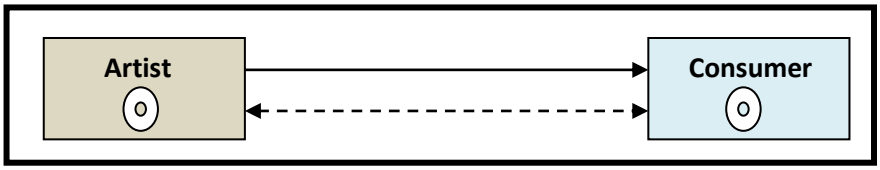
The IFPI's 2014 RIN report stated that performance rights offer producers and artists an opportunity to supplement declining income from sales (IFPI, 2014). In the past decade, the music industry has witnessed two extraordinary events that support the dissemination theory.

In 2006, international rock band Radiohead announced that that they had completed all of their contractual obligations to their record label, EMI. The band added that most of their profit came from merchandise and concert ticket sales; thus, they would release their following album in 2007 independent of any record label (Young and Collins, 2010:345). This was the first time that any band had bypassed a record label in the creative process, and represented the beginning of the end for record labels (Bielas, 2013:4). Radiohead's release of their next album *In Rainbows* was a success but even more importantly, it was a huge loss for record labels and their position in the music industry (Bielas, 2013:6). By releasing the album on their own, Radiohead integrated the supply chain activities which were once entirely assumed by record

labels. Radiohead's experiment proved that artists can succeed with independent distribution and compensation methods (Bernardo and Martins, 2013:9).

In the same year as Radiohead announced their independent production, Nine Inch Nails announced on their band's website that they were withdrawing their contract with record label, Interscope (NME, 2007:1). "As of right now Nine Inch Nails is totally a free agent, free of recording contract with any label. I have been under recording contracts for 18 years and have watched the business radically mutate from one thing to something inherently very different and it gives me great pleasure to be able to finally have a direct relationship with the audience as I see fit and appropriate" (Renzor cited by NME, 2007:1). The figure below reflects the reintermediation of the artist and the consumer or audience in the music industry. The actions of the two bands reflect disintermediation and independence with bands releasing their albums in an independent capacity and addressing their fan base directly with all the perks of retaining full creative and business control, intellectual rights and the royalties obtained from distribution. Bernardo and Martins (2013:10) however report that these cases are not representative of all bands as the two bands mentioned already had an extremely large fan base and their announcement can be regarded as a bold move or promotional act. At the same time, the trend of individual musicians developing their own fan base and publishing records without major record contracts using digital distribution tools took off and has been observed in studies of groups of artists (Bernanrdo and Martins, 2013; Hracs, 2012; Young and Collins, 2010).

Figure 2.7: Both the Artist and the Consumer become Distributors



Source: Alves, K. (2004) Digital distribution music services and the demise of the traditional music industry: three case studies on Mp3.com, Napster and Kazaa. [online], available: http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1008&context=thesesinfo [21 July 2014]: Pp. 129.

Pietila (2009:247) attributes much of the on-going debate on the 'crisis' of the music industry that reflects the interests of the major recording labels and revolves around the question of how to secure rewards for music producers from the digital distribution and consumption of music. O'Neill (2009); and Hracs (2012) observe that with digitalisation, artists who previously belonged to record labels move away from such contracts to become independent music

entrepreneurs. Previously, the record labels paid a percentage of royalties from record sales to artists. As music entrepreneurs, artists are now entitled to all profits from album sales (Bernardo and Martin, 2013; Pietila, 2009). In addition, the digitalisation process brought artists and consumers into a direct business to consumer relationship. Building personalised relationships with fans and promotion through social media favours the self-promoting entrepreneur over the introspective artist, thereby potentially weakening music as a stand-alone art product and re-contextualising it as online media, consumed as part of the wider Internet, film or gaming culture (O'Neill, 2009:44).

Concerts and tours have always been the most important facet of artists' careers. Now that album sales have dropped, there is greater focus on concerts (Suede, 2014:2). Record labels that are still operational in South Africa are acknowledging this factor and implementing the "360 deal" where a record label will sign an artist and instead of making a percentage of album sales; they now make a percentage everywhere the artist earns, extending from live performances to sponsorships (Bacache, Bourreau and Moreau, 2014; Dahl, 2009; Suede, 2014). The music industry will move away from online piracy towards producing experimental merchandise together with live performances. Thus it is not surprising that during 2011 artists and bands, whom fans thought had retired, resurfaced with new albums and international tours. In effect, the decrease in album sales due to file sharing has resulted in increased demand for live performances (Dahl, 2009; Informa UK, 2010; Mortimer, Nosko and Sorensen, 2012; O'Neill, 2009).

2.4.5.2 Retailers' Response to Digital Distribution

At the time when CD sales were falling, the growth of vinyl is a beacon of hope in the music industry. Record Store Day was introduced as an annual celebration of independent record stores and has become extremely popular (Armstrong, 2015; Peoples and Crupnick, 2014). In the first half of 2014, 4 million vinyl records were sold compared with 2.9 million during the first half of 2013, an increase of almost 40% (Bernasek, 2014:1). During the same period, album sales in the U.S decreased by 15% to 121 million units due to the decrease in sales of CDs and digital albums.

Although vinyl has grown rapidly, it comprises only 3% of total album sales and is dwarfed by digital downloads; online streaming increased by 40% in early 2014 to 70 billion songs. According to Bernasek (2014:2), one of the reasons that vinyl has made a comeback is that "When you buy virtual music you've got nothing to hold on to. So for the first time with records, kids are holding something physical in their hands and collecting something they can show off and be proud of." Alternatively, vinyl enables nostalgic members of the older

generation to relive their youth (Armstrong, 2015:1). Although vinyl is a mainstream product, Peoples and Crupnick (2014:4) note that people that buy it are more likely than the average music consumer to listen to Internet radio, follow musicians on social media and stream music online. Diduck (2015:4) noted that in 2014, vinyl sales amounted to less than 2% of physical format sales.

2.5 Operational Processes

Traditional supply chain strategies are categorised as lean manufacturing (Brown and Hagel, 2008; Stevenson 2012) and represent push or pull strategies (Simchi-Levi, Kaminsky and Simchi-Levi, 2009; Stevenson, 2012) which originated in the physical distribution component of supply chain management (Bowersox, Closs, Cooper and Bowersox, 2013; Chaffey, 2015; Stevenson 2012). Push-pull systems describe the movement of a product or information between the supplier and the customer (Chaffey, 2015). In the supply chain, consumers usually "pull" the goods or information they demand for their needs, while suppliers "push" the goods or information towards the consumers (Chaffey, 2015; Simchi-Levi *et al.*, 2009; Stevenson, 2012). In traditional supply chains the stages operate normally in both push-based and pull-based systems. Push production is based on forecast demand while pull production is based on actual or consumed demand. The interface between the two is referred to as the push-pull boundary or the decoupling point and is the elimination of one or more processes from the distribution channel (Pienaar and Vogt, 2009; Simchi-Levi *et al.*, and Simchi-Levi, 2009; Stevenson, 2012).

Media and music analysts have observed significant changes in the music industry and predict further major changes in the future. The introduction and success of social networking, together with the rise of digital music, has transformed the way music is marketed to the consumer, shifting from a push to a pull strategy (Brown and Hagel, 2008; Ng and Chung, 2008). According to Coupey (2005:332-333), differences in the extent to which the consumer controls exposure to a message and the form of the message, are related to push versus pull forms of information delivery.

This section examines traditional pull- and push-based systems in the music industry and the transition to Internet-based communications, focusing on push and pull innovations that arose during the transition from brick-and-mortar to click and mortar-based systems.

2.5.1 Push-based Strategy

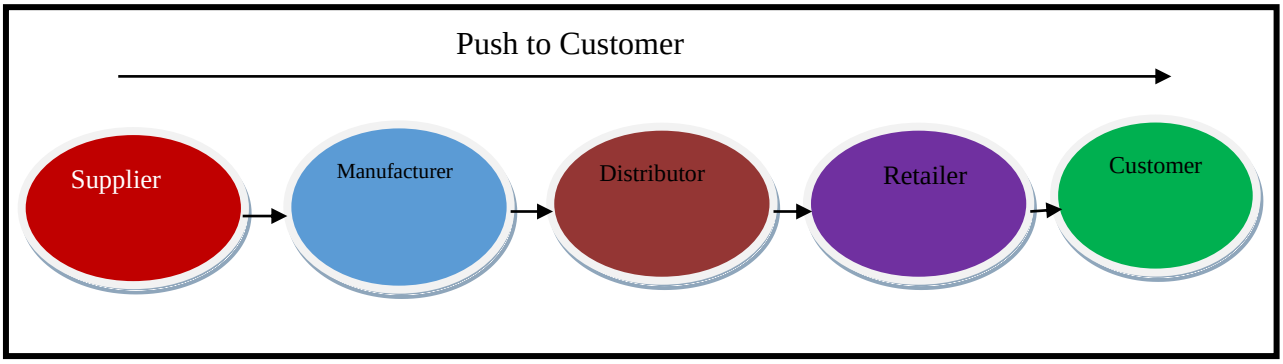
Push-based supply chains feature a marketing campaign that is in total control of the message disseminated. Depending on the medium used, the communication can be either interactive or non-interactive. Broadcast communications such as electronic mails (e-mails), radio or television advertisements are typically push communications which originate with the organisation and are delivered to a relatively passive audience where it is not possible for the buyer to interact. Chaffey (2015); Coupey (2005); Benton (2014); Kruger *et al.* (2007); and Stevenson (2012) describe a push system as "a system whereby a business manufactures good, stores the goods in warehouses, and moves them from the warehouses to the points of sale in accordance with high demand". Higher inventories are stored in warehouses as the volume of manufacturing is not in line with demand. The inventory decreases as demand increases while at the same time inventory increases as demand increases (Benton, 2014; Coupey, 2005; Pienaar and Vogt, 2009; Simchi-Levi *et al*., 2009). This can be identified as the approach that operated in the traditional music industry.

According to Benton (2014:205) the primary purpose of push systems are to control inventory levels, assign priorities and execute product flow through a production facility. Push manufacturing activities are guided by master production schedules, bill of materials, inventory records, and output reports which imply that production is based on forecast demand (Pienaar and Vogt, 2009; Simchi-Levi *et al.*, 2009; Stevenson, 2012). Kruger *et al*. (2007) note that the days of manufacturing goods and services according to a push system are over. Brown and Hagel (2005:84) observe that the highly specified, centralised and restrictive nature of push systems prevents companies from experimenting, improvising, and learning as quickly as they might, both throughout their own organisations and across others. Push systems not only inhibit product innovation, but also make it difficult to rapidly implement process innovations. They therefore prevent organisations from participating in the distributed resource networks that are now necessary for competitive advantage (Brown and Hagel, 2008). This is typical of the traditional supply chain system in the music industry where the focus is on internal production and disinclination to outsource (Steyn, 2005).

The next frontier of innovation requires broader adoption of pull capabilities as well as less reliance on traditional push systems. As demand becomes increasingly difficult to forecast, the system performs increasingly poorly in delivering the efficiency it was designed to promote (Brown and Hagel, 2005). Fitzsimmons and Fitzsimmons (2008:14) note that a product development model driven by technology and engineering could be titled a *push theory of innovation*. The push model is characteristic of manufacturers that develop an innovative

product, identify a suitable target and create a distribution channel to push the product to the market (Chaffey, 2015:265). The figure below illustrates the push-based strategy.

Figure 2.8: Push-based Strategy



Source: Chaffey, D. (2015) *Digital Business and E-Commerce Management Strategy, Implementation and Practice*, 6th ed., London: Pearson: p. 265.

The aim of push-based systems is to optimise the production process for cost and efficiency.

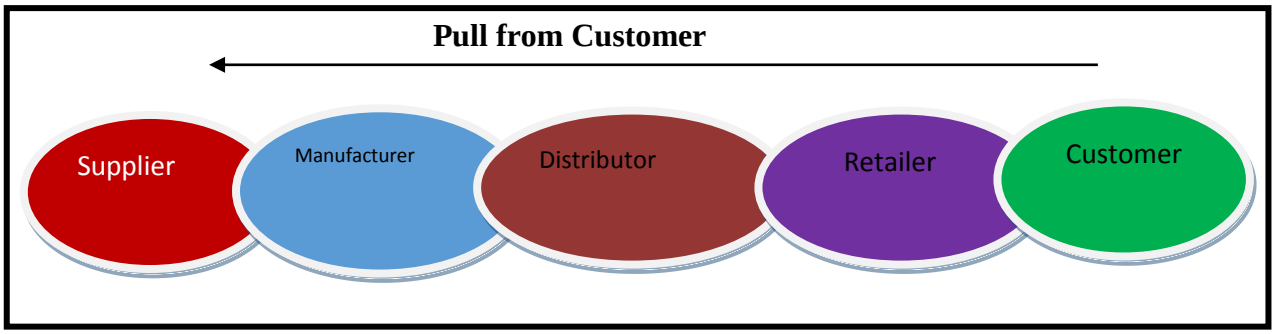
2.5.2 Pull-based Strategy

A pull system is a system where the manufacturing volume of a specific product or service is based on demand; hence an increase or decrease in demand results in minimal inventory as supply is attuned to demand (Benton, 2014; Kruger et al, 2007; Simchi-Levi et al, 2009; Stevenson, 2012). The media have been transformed by the digitalisation of content in the form of text, voice or video, and new ways for customers to access and distribute digital content through the Internet (Brown and Hagel, 2008; Chaffey, 2015). In contrast to push-based systems, rather than waiting for media organisations to push their content, customers are instead increasingly pulling information at will (Brown and Hagel, 2005:85). The pull strategy is perceived as a shift in power from marketers to the consumer. It is initiated by the consumer and requires higher levels of activity (Benton, 2014; Coupey, 2005). In cases where communication is done electronically, the consumer has the opportunity to interact with the seller. In these types of systems it is possible for the consumer to demand the information they require. According to Brown and Hagel (2008:93) "pull models help people come together and innovate in response to unanticipated events, drawing upon an array of highly specialised and distributed resources. Rather than seeking to constrain the resources available to people, pull models strive to continually expand the choices available while at the same time helping people to find the resources that are most relevant to them." Thus pull models provide individuals with the tools

(PCs, cellular phones or any medium to connect to the Internet) and resources (including connections to other people and groups through social media, Twitter, Facebook and Myspace) required to take the initiative and creatively address opportunities as they arise. In the contemporary music environment. Pull models become appropriate as customers and fans demand services and more involvement in activities. This results in an increase in online music service providers and social media interactions. Pull models hence treat consumers as networked creators.

The figure below shows the closer links between the elements of the supply chain through the use of technology.

Figure 2.9: Pull-based Strategy



Source: Chaffey, D. (2015) *Digital Business and E-Commerce Management Strategy, Implementation and Practice*, 6th ed., London: Pearson: p. 265.

The aim of pull-based systems is to optimise the production process for customer response, cost and efficiency (Chaffey, 2015:266).

Media distribution businesses are pull-based systems that have simplified the traditional ways of doing business. New content distribution expands the range of content available and provides robust tools to assist consumers to search for the content they need (Brown and Hagel, 2008:94). In the digital environment, pull approaches have transformed distribution channels. On the production side, a vibrant "remix" culture has arrived with the availability of widely accessible digital audio-editing tools which allow DJs in nightclubs and fans or consumers to pull music files from a variety of music sources and compile their own personalised playlist. Pull approaches are characterised by market research, the technology used to conduct research and integrate data, short cycles and response times, and low inventory levels (Chaffey, 2015:265).

2.5.3 The Differences between Push and Pull Systems

The table below highlights the differences between the two systems (Brown and Hagel, 2008:99):

Table 2.2: Differences Between Push and Pull Systems

Push Systems	Pull Systems
Demand can be anticipated	Demand is highly uncertain
Top-down design	Emergent design
Centralised control	Decentralised initiative
Procedural	Modular
Tightly coupled	Loosely coupled
Resource-centric	People-centric
Participation restricted (few applicants)	Participation open (many diverse applicants)
Focus on efficiency	Focus on innovation
Limited number of major reengineering efforts	Rapid, incremental innovation
Zero-sum rewards (dominated by extrinsic rewards)	Positive-sum rewards (dominated by intrinsic rewards)

Source Brown, J.S. and Hagel, J. (2008) 'From Push To Pull: Emerging Models For Mobilizing Resources', *Journal of Service Science*, 1(1): p. 99.

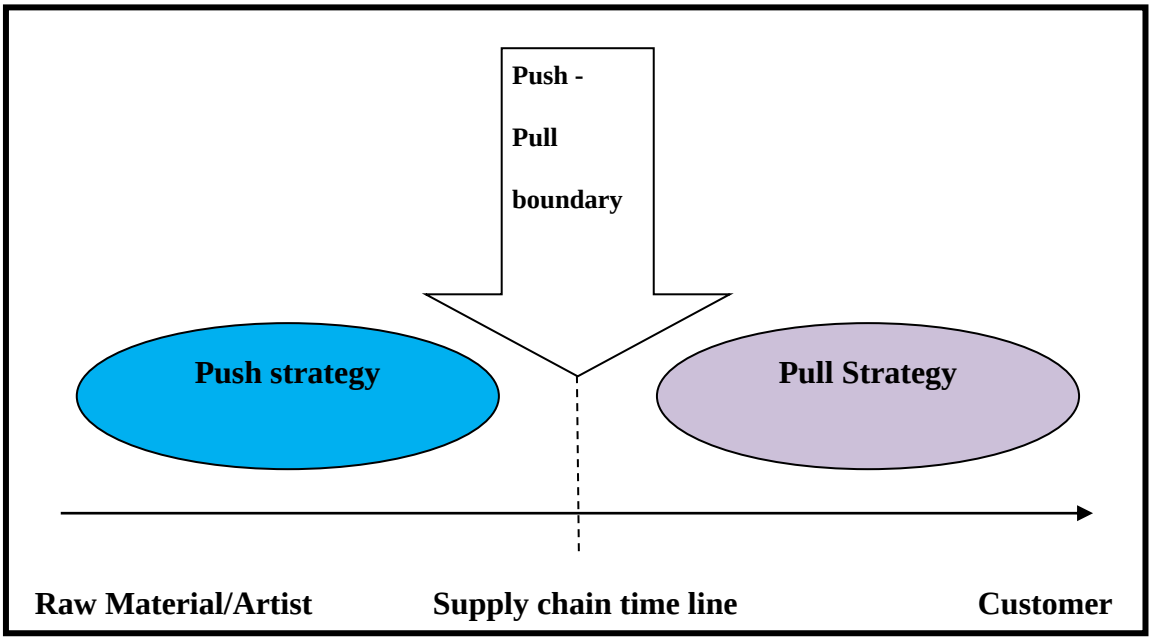
2.5.4 Decoupling Point on Push-Pull Supply Chain

According to Benton (2014); Chaffey (2015); Kruger *et al*. (2007); Pienaar and Vogt (2009); and Simchi-Levi *et al*. (2009) in a push-pull strategy the initial stages of a supply chain operated in a push based manner, while the remaining stages operated in a pull-based manner. The interface between the two is known as the push-pull boundary or the decoupling point. Kruger *et al*. (2007); and Simchi-Levi *et al*. (2009) note that the push-pull boundary is located somewhere along the supply chain timeline, and indicates the point in time when the firm switches from managing the supply chain using the push strategy to a pull strategy (see Figure 2.10).

Ng and Chung (2008:28) found that the distributor should act as the push-pull boundary of the supply chain to resolve increased inventories from upstream parties due to economies of scale in the production process; while on the other hand the distributor has to provide efficient service

with smaller order quantities and to satisfy the high availability requirement of its downstream parties. The reason is that the upstream deals with a push strategy and is based on the forecasted figures. On the downstream, the pull strategy prevails and is market driven. This means that smaller lot sizes are necessary across different products to meet demand levels on the downstream side. This is where the role of the distributor becomes strategic in nature. The distributor holds stock and then distributes based on demand (order-driven), thereby becoming the push-pull boundary. In the music industry, the distribution was controlled by the record label. The mass consumption of digital music on the Internet created the decoupling point (see Figure 2.10). This is different of traditional operations in the music industry where the supply chain was push-based and demand was based on forecast. In the contemporary music industry, music consumption driven by and on the Internet was the decoupling point in the supply chain. At present, the music industry is dominated by an e-commerce environment where demand is driven by customers on peer-to-peer music websites where they can download music for a fee or free of charge.

Figure 2.10: Push-Pull Supply Chains



Source: Simchi-Levi, D., Kaminsky, P. and Simchi-Levi, E. (2009) *Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies*, 3rd ed., New York: McGraw Hill: p.190.

The decoupling point in the supply chain is the Internet. Simchi-Levi *et al*. (2009:200) note that Internet technology is the force behind e-commerce and identify three dimensions of the push-pull boundary: demand across products (the diversity of artists available to customers on the Internet), geography (customers' access to artists whose music exists in remote areas of the world and may be popular but inaccessible), and across time (demand has short or no lead times because a single music track is duplicated and the single unit is sold multiple times) (Fox, 2004:204).

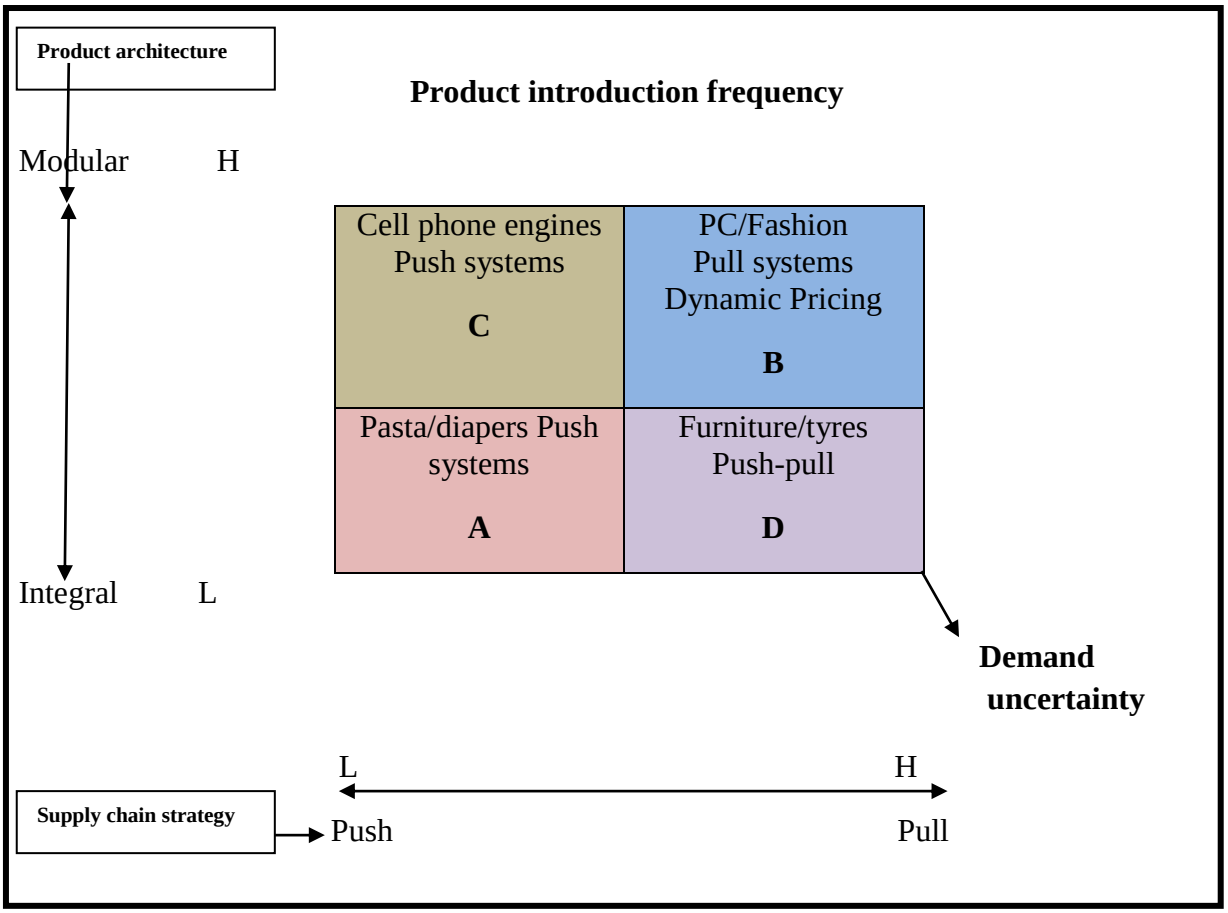
2.5.5 The Digital-based Supply Chain-Based Strategy: "Market-Pull" and "Technology-Push"

According to Benton (2014); and Pienaar and Vogt (2009) the push phase consists of standard stages, whereas the pull phase consists of stages that contribute to product differentiation. In manufacturing electronic equipment, a push-pull approach would exist when the same electronic equipment manufacturer assembles and supplies its products according to differentiated customer specifications. Benton (2014); and Pienaar and Vogt (2009) however note that that the phase of the supply chain starting from the time of differentiation is pull-based. The terms 'market pull' and 'technology-push' are strategies identified by Alves (2004); and Tidd and Bessant (2009) for product development.

Benton (2014); Brown and Hagel (2005); Brown and Hagel (2008); Coupey (2005) and Chaffey (2015) acknowledge that many organisations are adopting a flexible approach to set tangible and intangible assets in place within or outside their boundaries. The music industry's global shift to the decoupling point results in a developmental supply chain. Simchi-Levi *et al*. (2009:338) describe a developmental supply chain as one that focuses on new product introduction and involves product architecture, strategic partnering, supplier footprint and supply contracts. Simchi-Levi *et al*. (2009:339) identifies two distinct types of developmental products: innovative and functional. The latter are characterised by slow technology clockspeed, low product variety and typically low profit margins (this is further discussed later in this chapter). In contrast, innovative products are characterised by fast technology clockspeed (bandwidth), a short product life cycle (replication of music tracks), high product variety and relatively high margins. Hence with demand in the music market being dictated by customers; organisations adapted to new changes and trends by developing complementary technological enabling devices which allowed the downloaded formats to be played on compatible portable devices, mobile phones, home theatre systems and similar devices. These are generally referred to as complementary technologies or modular products. Klym (2005); and Simchi-Levi *et al*. (2009) describe modular products as products assembled from a variety of modules such that, for each module, there are a number of options. An example is a music track on the Internet

which can be customised by being played on different devices like an MP3 player to play MP3 files, or the more recent MP4 files now reaching wider devices from car radios, to cellular phones, Notebooks, iPads and Blu-ray players. In the same vein, a PC is a modular product and hard drives, memory cards, and monitors are customised additions.

Figure 2.21: The Impact of Demand Uncertainty and Product Introduction Frequency on Product Design and Supply Chain Strategy



Source: Simchi-Levi, D., Kaminsky, P. and Simchi-Levi, E. (2009) *Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies*, 3rd ed., New York: McGraw Hill: p. 340.

The diagram shows that high product introduction frequency (fast clockspeed) indicates a focus on modular product architecture as this allows the independent development of subcomponents so that the final feature set selection and product differentiation are postponed until the demand is acknowledged. However this is not as important when product introduction frequency is low (Simchi-Levi *et al*., 2009:340). The digital music age represents quadrant B which incorporates products with fast clockspeed and highly predictable demand. High-tech developmental and innovative products are characteristic of this industry where the focus is on responsiveness, employing the pull strategy (Simchi-Levi *et al*., 2009:340).

The new product determines the best strategy that an organisation can adopt. For incremental adaptations or product extensions where customers are familiar and comfortable with a product type, "market-pull" is the suitable approach. Tidd and Bessant (2009:390-391) note that there are "many 'needs' that the customer may be aware of, or unable to articulate, and in these cases the balance shifts to a 'technology-push' strategy". Alves (2004); Klym (2005); Stensrud, 2014; and Tidd and Bessant (2009) observe that customers do not buy technology; they buy products for the benefits that they can receive from them. The 'technology-push' provides a solution to their needs. Stensrud (2014:3) supports this by saying "if you think Apple is in the business of selling music you are seriously deluded. Apple is in the business of selling IPods. Selling music is a necessary sideshow for Apple and, with 75% + of the market they barely break even." Alves (2004:130) adds that "although technology impacts on consumers; it is also important to note that technology is also shaped by consumer adoption and modification."

The technology-push approach has been described as 'first-generation R&D', the 'market-pull' strategy as 'second-generation' and the close coupling as 'third generation' (Roussel, Saad and Erickson, 1991; Tidd and Bessant, 2009). According to Tidd and Bessant (2009:462) technology-push appears to be the dominant strategy because highly specialised technical knowledge is essential about what is feasible at the beginning and hence have an idea about what the characteristics of the final product are likely to be.

2.5.6 The next frontier – Internet communications and the implications of digital distribution for the music industry

Jin and Li (2012:1) note that the "digital content market is undergoing an evolution in networking and digitalisation technologies". Jaakkola, Linna, Henno, Makela and Welzer-Druzovec (2012:252) observe that "social media are media for social interaction, using highly accessible and scalable communication techniques". Web-based and mobile technologies are used in social media to turn communication into interactive dialogue. Chaffey (2015); and Weinberg (2010) state that with the increase in social network sites (SNS), social networking has become a major and focal reason for the music industry to adopt the pull strategy. Chaffey (2015:7) defines social media marketing as "Monitoring and facilitating customer-customer interaction and participation throughout the web to encourage positive engagement with a company and its brands. Interactions may occur on a company site, social networks and other third-party sites". SNS sites include popular social media sites Facebook, Twitter, Google+, and Myspace; while the rich media of social media marketing includes online video and interactive applications featured on special social network sites such as Youtube. Caffey (2015); and Weinberg (2010) identify the six main types of social presence employed by artists in communicating with fans and vice versa:

- **Social networking** – the emphasis is on listening to customers and sharing or engaging in content. Facebook is the most popular and important for consumer audiences;
- **Social knowledge** – refers to informational social networks like Yahoo where one can help the consumer by solving their problems and showing how your products have helped others;
- **Social sharing** – social bookmarking websites;
- **Social news** – used by artists to promote live performances and new album or track releases on sites like Twitter;
- **Social streaming** – rich, streaming social media sites for sharing photos, videos and podcasting; and
- **Company user-generated content and community** – are different from other types of social presence which are independent of business. This is the company's own social space which may be integrated with product content or customer support.

Jaakkola *et al*. (2012:252) note that the creation and exchange of user-generated content is known as consumer-generated media (CGM). In addition to social media being used as a tool for the pull strategy, Chaffey (2015); and Flurry (2013) note mobile commerce surpasses desktop usage due to the growth and popularity of mobile apps. Chaffey (2015:12) defines mobile commerce (m-commerce) as "electronic transactions and communications conducted using mobile devices such as smartphones and tablets, and typically with a wireless connection". Wireless connections are also known as Wi-Fi and are used by consumers to download films and mobile music. Mobile apps are defined as "a software application that is designed for use on a mobile phone, typically downloaded from an app store. The iPhone Apps are best known, but all smartphones support the use of apps which can provide users with information, entertainment or location-based services such as mapping" (Chaffey, 2015:12).

The focus is the consumer by trying to target appropriate geographical spaces and identify the audience. Consumers are increasingly customising to suit their individual needs. Instead of depending on labels to release a compilation album, consumers are downloading the single songs they want and making their own compilation. Some go a step further and take over the packaging and marketing of music where online communities participate in the multiplication, broadcasting and distribution of digital music that were once facilitated through record companies (Alves, 2004; Coupey, 2005). This process is replicated worldwide by customers through establish e-tailers such as iTunes, Spotify and Last FM. These trends indicate a noticeable shift to a pull-based strategy as they are shared on peer-to-peer websites. Consumers are now choosing what they want rather than having it pushed at them. As consumers gain

access to more platforms to acquire digital music, and more information about such services; they are likely to become more demanding of resource providers and dictate the need for modular value adding products. Alves (2004); Benton (2014); and Chaffey (2015) observe that the restructuring of the supply chain in the music industry demonstrates how technology facilitates reverse markets where the definition and roles or the stakeholders change. Finally, the cost of entry and investment into an online market is relatively low compared to the investment made by record companies operating in the traditional industry, therefore further enabling the provision of information to diverse and widespread online communities.

2.6 Value Adding Innovations Influencing Distribution

Music has become easily obtainable. An individual with a PC and access to the Internet can acquire. Much of the shift from traditional music distribution can be attributed to the digital age and its global presence. According to Ernst & Young (2011:2) "Digitalisation at its simplest means the conversion of analogue information to digital information. As digitalisation capabilities extend, almost every aspect of life is captured and stored in some digital form, and we move closer towards the networked interconnection of everyday objects." Innovation plays an important role in augmenting quality and performance. The result is real-time, global exchange of information between multiple connected devices which can be fixed (such as appliances in our homes) or mobile (such as mobile devices, laptops, Notebooks, iPads and Tablets). These innovations are new combinations of technologies, knowledge and markets that are used simultaneously to create competitive advantage and satisfy consumer demand (Waldner, Zsifkovits, Lauren and Heidenberger, 2011:1).

Seo, Dinwoodie and Kwak (2014:3) define innovativeness as a collective perspective, where openness to new ideas is a characteristic of an organisation's culture. It denotes proactive willingness to surrender old habits or ways and to experiment by seeking opportunities rather than taking advantage of current strengths. Garcia and Calantone (2002:113) define innovativeness as the capacity of a new innovation to influence the firm's existing marketing resources, skills, knowledge, capabilities or strategy. Hence, innovativeness strengthens the competitive position of organisations in markets where customers demand rapid change and differentiation is limited. Innovation facilitates flexibility in building, selecting and adapting various strategies (Seo *et al*., 2014:3).

Expanding technology-driven and knowledge-based environments demands a dynamic state of knowledge and faster flows of information to tap into integrated technology in order to remain

competitive (Soosay and Hyland, 2004:42). Seo *et al.* (2014:4) describe supply chain integration as the strategic integration of both intra- and inter-organisational processes. It measures the extent to which supply chain partners work collaboratively to gain reciprocally beneficial outcomes. The literature review has examined the effect of traditional supply chain operations in the traditional and digital music environments. In order to avoid repetition and address how value adding innovations influence digital music distribution and consumption in the recording industry, this component examines the Digital Living Network Alliance (DLNA) between two global brands: Apple and Samsung, which are driving the organisational tools used by consumers to download, upload, share or create digital media content in the comfort of their own home.

2.6.1 The Digital Living Network Alliance (DLNA)

The Digital Living Network Alliance (DLNA) is a non-profit collaborative organisation established by Sony in 2003, initially under the name of Digital Home Working Group. The DLNA is responsible for defining interoperability guidelines to enable sharing of digital media (music, videos and photographs) between multimedia devices (Grabham, 2013:1). Home Networked Device Interoperability Guidelines v1.5 was established in March 2006 and expanded in October 2006 with the addition of two new products, printers and mobile devices. The number of DLNA Device Classes increased from two to twelve and there was an increase in supported user scenarios in response to changes in market demand which warranted new product categories. Depending on their DLNA compatibility device, a consumer will be able to stream or watch movies from their laptop on their Smart TV or play an MP3 stored on their phone over their home theatre entertainment system (DLNA, 2014; Laughlin, 2014).

The DLNA operates using Universal Plug and Play (UPnP) for media management, discovery and control. UPnP defines the type of device that the DLNA supports and the mechanisms for accessing media over a network (Grabham, 2013:2). The DLNA guidelines apply restrictions to the types of media file format, encodings and resolutions that a device might support. In 2013, more than 18 000 different device models obtained "DLNA Certified" status. It was estimated that by 2010, more than 440 million DLNA-certified devices ranging from digital cameras to televisions and game consoles were installed in users' homes (DLNA, 2014; Laughlin, 2014). The use of the diverse and interoperable product offerings from the DLNA, Apple and Samsung are necessary to provide consumers with broad, enthralling experiences and value in their homes and while on the go with mobile devices. Further information on the DLNA specifications, workings, company affiliates and listing of product compatibility can be found in Appendix A.

2.6.2 Shortcomings of the DLNA

Although the DLNA philosophy sounds appealing two shortcomings have been identified by Laughlin (2014). Firstly, the file formats for some DLNA devices plays MP4 video files but the device the file is sent to may be unable to recognise this type of file. This is also the case with LG TVs which do not support the DivX video file format. The second common problem is digital rights management (DRM). DRM controls the way that people share digital media in order to protect copyright. Laughlin (2014:3) notes that despite some devices being DLNA certified, it would not share certain music or video files with other devices due to DRM restrictions. This could explain why a major brand like Apple does not completely technically support the DLNA network. Apple iTune only sells music to which it has DRM. In this way, all transactions are legal and paid for.

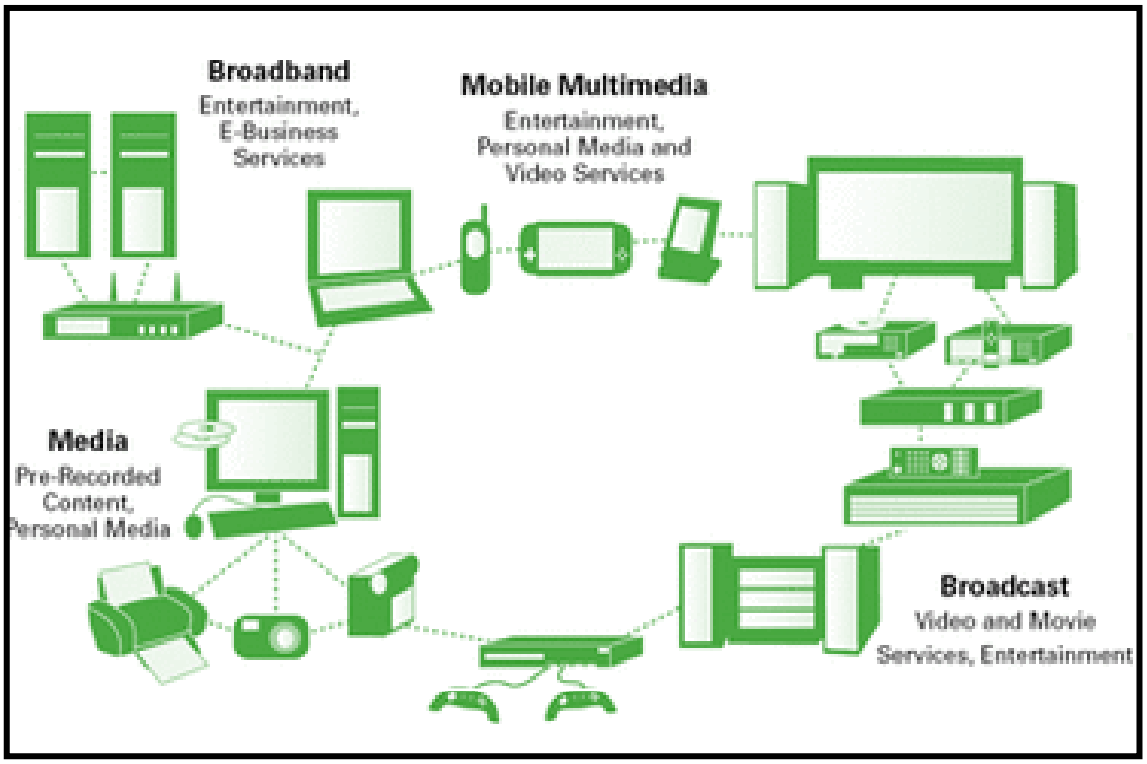
2.6.3 Different approaches to compatibility: Apple and Samsung

According to Laughlin (2014:3) Apple and Samsung have their own interpretation of the DLNA. While Samsung supports its use and this is evident in their diverse offerings of technologically compatible products, Apple has other views on home networking. The two systems are, however, a guarantee that devices offered by Apple and Samsung connected to a home network are compatible. For example, a Samsung Galaxy Tablet can be wirelessly connected to a Samsung TV if they are on the same network. Similarly, it is effortless to play content from an iPod to an Airplay or Docking station (Laughlin, 2014:4).

Diverse and interoperable products are necessary to provide consumers with broad, compelling experiences and value throughout their homes. Digital home entertainment has developed and it is now easy to stream music, video and other media around the home. The DLNA is designed to act as a bridge between various appliances so that the consumer can listen to music from their PC, Tablet, mobile device and online streaming service, thereby creating a type of home cloud, provided there is wired or wireless network.

Panton (2008:1) asserts that consumer electronics manufacturers demand that the end-consumer live in a digitally connected world populated by their products. The intention is to create a one stop shop that stocks DLNA certified products. Consumers will then be able to purchase compatible products while acknowledging the technological ingredients used in a device and determining whether it will be compatible in an ever expanding ecosystem of other complementary devices. The figure below shows how DLNA devices work simultaneously, making the compatible devices work in harmony.

Figure 2.12: Visualisation of How DLNA Devices Come Together



Source: Panton, M. (2008) *DLNA for media streamers—what does it all mean?* [online], available: http://www.cnet.com/news/dlna-for-media-streamers-what-does-it-all-mean/ [12 September 2014].

In 2014 Apple announced that it would give Irish band U2's new album to everyone with iTunes (Pasick, 2014:1). This album was not free, as Apple purchased a large quantity of U2 albums and placed their album in every iTunes library, making this process hugely transformative. U2 has a history of working with Apple. A decade earlier Apple released a U2-branded iPod device together with the world's first digital box set. Three years later, Apple made its music DRM-free and offered an exclusive chance to buy U2's latest single before other competing e-tailers like Spotify appeared in the marketspace (Pasick, 2014:1). The lead singer of the band stated that they were going to work with Apple on innovations that would transform the way music is listened to and viewed (Pasick, 2014:1). This concept was not a new one as Samsung had a more successful strategy with Jay Z's *Magna Carta Holy Grail* album. Neumayr (2014:1) adds that following Apple's purchase of *Beats* by Dre (a billion dollar head-phone manufacturing company owned by musician, Dr Dre.) which cost $3 billion, the U2 deal is merely a sign of things to come. This would usually be interpreted as a positive statement; however with the development of 3D printing and applications for the music industry, the deal made in 2014 to acquire Dre's *Beats* may have negative repercussions for Apple. In a world of

music competition, what Apple bought was a promotional tool for new offerings with an Apple watch to increase on-the-go music consumption (Martin and Davidson, 2014:2).

2.6.4 Consumer experience of digital technology

Digitalisation has changed the ways in which consumers conduct their daily activities. This includes the creation of, access to and consumption of music (Avdeeff, 2012; Molteni and Ordanini, 2003). The distribution of music is facilitated by the flexibility, modularity and portability of the media sharing offered by specific type of devices. Advances in mobile devices mean that people can now expand how, when and where they experience music (Heye and Lamont, 2010). Due to the convenience and value offered by technologically-innovative compatible products, supply chain integration is influenced by the level of innovativeness in these chains. This has facilitated numerous ways to access recorded music (Krause and North, 2014:1). Krause and North (2014:14) investigated whether music listening devices could predict everyday music listening practices; it was found that the advantages offered by the devices were associated with the devices used by the research participants. Technology usage, self-efficacy and how one used auditory technology; were related to the advantages offered by the different listening devices and those who accessed music over the Internet had the strongest positive music technology identity.

It is thus clear that distribution, consumption and demand are inter-related and influence one another in the way that innovativeness impacts on supply chain integration and supply chain performance. As noted by Alves (2004:130) "technology not only impacts on customers, but technology is also shaped by consumer adoption and modification." The MP3 format changed the way music was distributed. It warranted new products which enabled the compatibility of the music file format. Once MP3 players arrived in the market, further modular developments in the compression of music and movie files ensued and along with it devices that would allow those formats to be played. The digitalisation of music has spawned innovation in televisions, radios, mobile devices and social media and home theatre systems.

2.7 Technological Viability and Supply Chain Competitiveness

The transformation from traditional ways of doing business to progression towards digitalisation gave birth to diverse electronic devices and products to enhance the audibility of media content. Alves (2004); and Evans and Wurster (2000) identify a technology push effect that is described as "developments in technology including an increase in awareness of the MP3 standard, a rise in unlimited Internet and broadband and the proliferation of MP3 devices which are encouraging users to download more despite the downloading of free music." Similarly, the IFPI RIN Report (IFPI, 2014) advised that expensive data charges and low bandwidth are significant barriers to digital music growth. Hence in order for digitalisation to be dispersed, significant speed and availability of Internet access, connectivity and bandwidth is required (Lam and Tan, 2001:63).

2.7.1 Characteristics of Non-digital Products

Whinston, Stahl and Choi (1997) identify the following three properties of digital goods:

- Indestructibility (the tendency of a digital product to maintain its form *ad infinitum*)
- Transmutability (the ease with which a digital product can be modified); and
- Reproducibility (the ease with which digital products can be reproduced, stored and transferred).

Chowdhury, Bergquist and Akesson (2014:1) observe that as continuous digitalisation of non-digital products changes the component's architecture; digital music characteristics influenced by this affect the market structure. From a supply chain perspective, the property of reproducibility is what makes digital goods vastly different from physical goods by allowing for sufficient storage and bandwidth to create, copy, move and transport the product (Bockstedt, Kauffman and Riggins, 2005; Whinston, Stahl and Choi, 1997). Replication does not need to operate in the traditional environment which was controlled by the album producer in the manufacturing process. There is no longer a need for raw materials or energy to be utilised in the process as replication, together with free distribution by means the Internet, is practically instantaneous (Sweeny and Ryan, 2008:219).

Digital products have almost zero marginal costs because once the first copy of the software has been developed (a music track), the costs involved in creating and disseminating the second (and further copies of the same initial music track) are practically zero (Bacache, Bourreau and Moreau, 2014; Fox, 2004; Waldfogel, 2012; Whinston, Stahl and Choi, 1997). The facilitation of replication together with the Internet creates a scenario where any digital product is an abundant product, as opposed to physical products whose supply can become scarce (Bockstedt

et al., 2005; Shapiro and Varian, 1999). The table below highlights the characteristics of digital music products.

Table 2.3: Characteristics of Digital Music Products

Characteristic	Players affected	How they are affected
Easily reproduced	Record label	Low manufacturing costs
	Artist, record label	High cost to make "master" Low break-even
Easily transferred	Record label	Low distribution costs
	Consumer	Cheap, high quality product
Effective electronic format	Digital music retailer	Low inventory costs Low menu costs
	Consumer	Easy pre-purchase sampling Likes high portability Values high compatibility Demands additional product features: artwork, lyrics, etc.
Equivalent quality	Consumer	More product options
	Physical retailer	New entrants can compete
Separability	Artist, label	Song "single" is the product

Source: Bockstedt, J., Kaufman, R. and Riggins, F. (2005) *The Move To Artist-Led Online Music Distribution: Explaining Structural Changes In The Digital Music Market*. [online], available: http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=1385598 [30 March 2014]: P. 5.

The fact that digital music is cheaper to reproduce and transfer, and is portable and easy to store creates significant intellectual property (IP) concerns (Bockstedt *et al.*, 2005:5) due to the similarity in listening experience using digital formats of music and the traditional means which is a CD.

2.7.2 Technical drivers influencing competitive distribution

The non-physical characteristic of software has created significant challenges (Sweeny and Ryan, 2008:217). Distributing music involves numerous technical enablers and technology which influences the creation and transfer of digital music. If technology is absent at any stage in the supply chain, the supply chain will fail and digital music file sharing will not reach the consumer or its destination. The technical dimensions refer to the technologies involved in the distribution of music and how they interact in delivering the final digital product.

2.7.2.1 Access to Bandwidth

The first step in transferring music online is to download a file. This is essential as the file needs to exist on a PC before it can be uploaded onto a server. This takes the form of ripping an original cd onto the PC. According to Alves (2004); and Hill (2003) the process of downloading a file refers to the transfer of a song from a server to a PC. The transfer of a song from a PC to a portable device such as an MP3 player is similar. Peer-to-peer downloads follow from one PC to another without the file residing on the server or repository.

Bandwidth constraints are significant in distributing digital products. Some music files are large and use large gigabytes of storage space. Even high-speed DSL lines may be inadequate to distribute such large files. The choice of Internet service provider is imperative in ensuring high-speed service. Multiple web servers are used and balanced equally so that traffic can be processed during peak times. Furthermore, providers closer to the Internet support are likely to provide an effective service but at higher cost. Partnering with external companies is viable way to address bandwidth dilemmas (Sweeny and Ryan, 2008:219).

At 28 kilo bytes per second (kbps) modem connection takes about two-and-a-half minutes to download one song and 30 minutes to download an album. This is considered “too long” for the customer. Broadband connection speeds are one megabyte per second (mbps) and more, allowing consumers to download an album in MP3 format within a minute. With this type of internet connection speed, there is mass consumer demand for music (Adner, 2002:13).

Technological developments have given consumers immediate access to large databases of music at high download speeds. Alves (2004); Evans and Wurster (2000); IFPI (2014); Lam and Tan (2001); and Macedonia (2000) attribute the growing popularity of downloads to technological developments. The increase in downloading is a result of the move towards broadband communication in the home, thereby offering consumers high speed connection and quicker downloads. The result was the design of PCs with fast processors and large storage capabilities to handle faster downloads. Alves (2004:28) notes that technology is not only facilitating but encouraging the use of distribution services. Developments in the technological sphere are enabling quicker downloads from the Internet.

In an attempt to increase Internet availability, Microsoft launched a television white-spaces spectrum pilot in Limpopo in 2014 by using unused portions of the radio frequency spectrum reserved for broadcasting to deliver affordable Internet access to areas that previously lacked access in the hope that this would encourage further deployment throughout SA and Africa. The

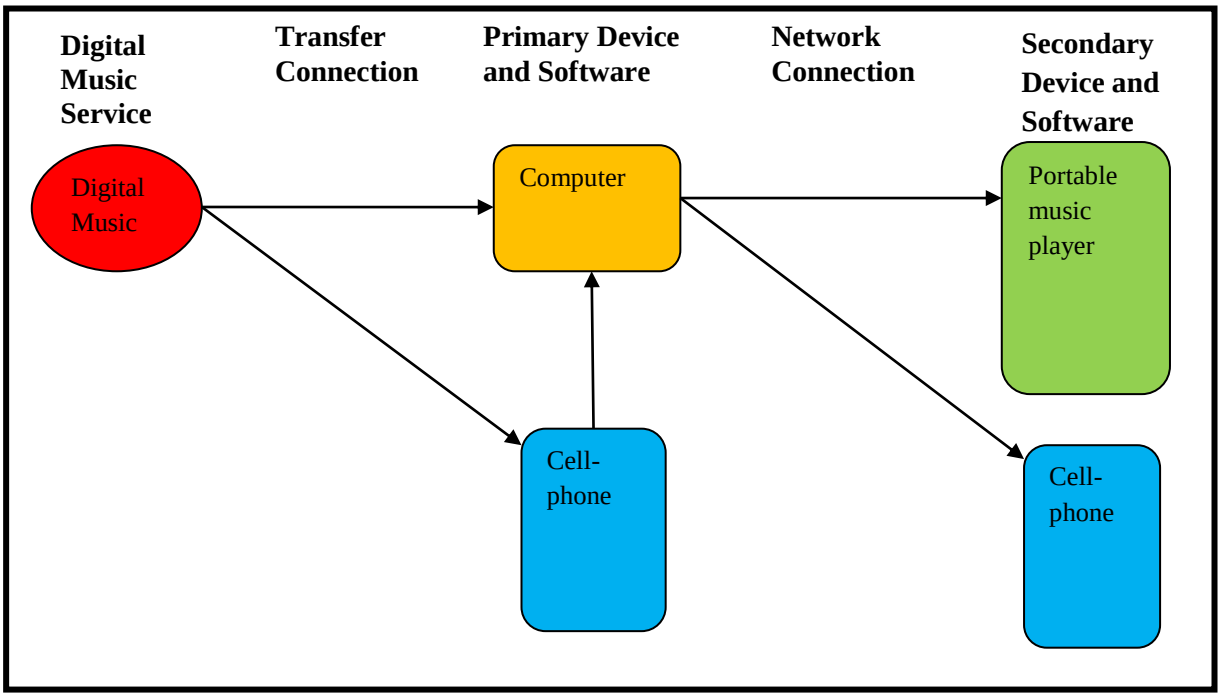
focus of this pilot project is to provide low-cost broadband access for the majority of South Africans within the next six years (van der Berg, 2014:1).

NAP Africa is a neutral Internet Exchange Point (IXP) located within data centre facilities in SA. In 2015, NAP Africa announced that Africa's most successful neutral peering exchange had reached a record-breaking peak of 15 gigabytes per second (Gbps) making it the second largest IXP and adding value to the development of South African's access to the Internet. According to McCann (2014:1) "it was launched in March 2012, by December 2013 traffic was peaking at 5Gbps in a little over two years, NAP Africa has outperformed other leading IXPs by achieving double-digit growth. This rapid adoption by the market proves that peering exchanges are a much needed facility in the African Internet ecosystem." McCann (2014); and NAPAfrica (2014) note that peering in Africa not only makes the Internet more affordable, but also plays a vital part in advancing the development of the Internet ecosystem by lowering costs and creating a superior usage experience for the consumer which in turn drives demand for the whole industry. Increasing Internet usage, the development of mobile technologies, improving national connectivity and growing access to international connectivity are the driving forces in developed markets (McCann, 2014:1).

2.7.2.2 Complementary Media Devices

Messerschmitt and Szyperski (2003); and Sweeny and Ryan (2008) point to a sharp distinction between digital and physical products in that goods such as software or media content cannot exist without a physical support infrastructure (hardware). Software applications and the like require layers of other software products to be present on the hardware before it can work properly. An example is typical Apple products like an iPod which can only play music purchased from the iTunes store or in iTunes format. The same applied when MP3 players were released which enabled consumers to transfer their music from PCs to their portable MP3 players. The figure below presents an overview of today's digital music services (Klym, 2005:6).

Figure 2.33: Overview of Current Digital Music Services



Source: Klym, N. (2005) *Digital Music Distribution*. [online], available: http://cfp.mit.edu/docs/digital-music-dec2005.pdf [11 August 2014]: p. 6.

The most popular models for digital music consumption are Internet-based downloads to a PC and the option to transfer files to a portable music player and or a cellular phone. Mobile service offers direct over-the-air downloads to cell phones, with the ability to transfer to a PC by means of wireless frequencies (wi-fi), Bluetooth or an usb cable. The literature identifies technology as a major factor in the popularity of transferring digital music online.

2.7.3 Technology influences music entrepreneurship

In the traditional music industry, only musicians who were signed with labels could produce an album and enjoy the benefits offered by the music industry. Independent musicians had no means of marketing and distributing their music. Distribution deals were exclusively with major and independent labels. The resources and technology did not yet for independence in every aspect of the process from production to distribution.

With the advent of technology that enabled independent music creation, the landscape changed. Bacache, Bourreau and Moreau (2014:2) observe that digitalisation has reduced the cost of a self-releasing strategy or music entrepreneurship in the following ways:

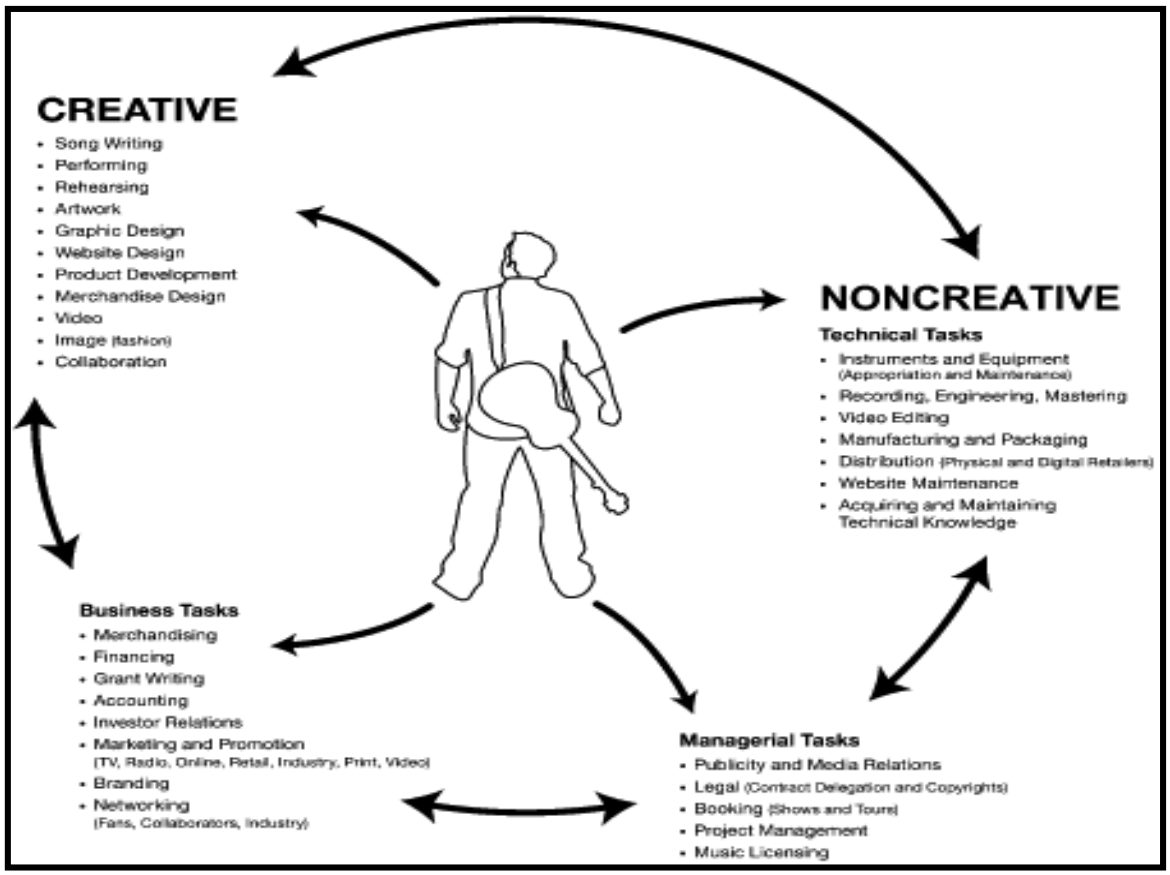
- with the development of the digital home studio, recording costs have declined to almost zero (Bacache, Bourreau and Moreau, 2014; Fox, 2004; Waldfogel, 2012; Whinston, Stahl and Choi, 1997);
- distribution costs have become negligible; and
- new opportunities for online promotion have emerged, allowing an artist to promote their music on websites or social media networks like Myspace, Facebook or Soundcloud.

Leyshon (2009); Pietila (2009); and Waldfoel (2012) add that digitalisation has enabled small independent labels to enter the music industry. The introduction and continual development of digital technologies provides musicians with the tools they need to be truly independent; hence innovation inspires independent music entrepreneurship. Recording can now be performed in digital home studios using include hardware (a computer) and software (an audio sequencer or digital instruments). This reduces the cost of recording so that it becomes accessible to musicians with few resources (Bacache, Bourreau and Moreau, 2014:2). In addition, the development of professional production and consumer software for recording, editing, mixing, and mastering digitally recorded music has facilitated an increase in the number of independent musicians. Digital technologies have democratised the production of music by making traditionally expensive and specialised in-house activities accessible and a wider range of talents has been exposed. Technological developments have removed the traditional barriers of cost and skill.

Although the independent release of albums by bands Radiohead and Nine Inch Nails were favourably received (Bacache, Bourreau and Moreau, 2014; Dahl, 2009; Suede, 2014); the same cannot be applied to musicians in general in the industry. A similarly world famous artist like Madonna signs 360 degree contracts or equity deals where all the artist's activity is controlled by a single company. Dewenter, Haucap and Wenzel (2012); and Karubian (2009) mention that 360 degree deals mean less control for the artist and are therefore a strategy which is the opposite of the self-releasing strategy. This is a step backwards for an artist as the complete integration of the supply chain process is similar to that held by music labels before 1999 when digitalisation and file sharing changed the way music was produced and handled. Hence, the effects of digitalisation on self-releasing or music entrepreneurs are twofold as it can either result in more albums being released by Radiohead (independence in music creation and production) or less for Madonna (artists signing 360 degree contracts). The figure below depicts

the complete supply chain integration of the musician when engaging in the self-releasing strategy or music entrepreneurship.

Figure 2.44: The Creative and Non-Creative Tasks of Independent Music Production



Source: Hracs, B.J. (2012) 'A Creative Industry in Transition: The Rise of Digitally Driven Independent Music Production', *Growth and Change*, 43(3), p. 457.

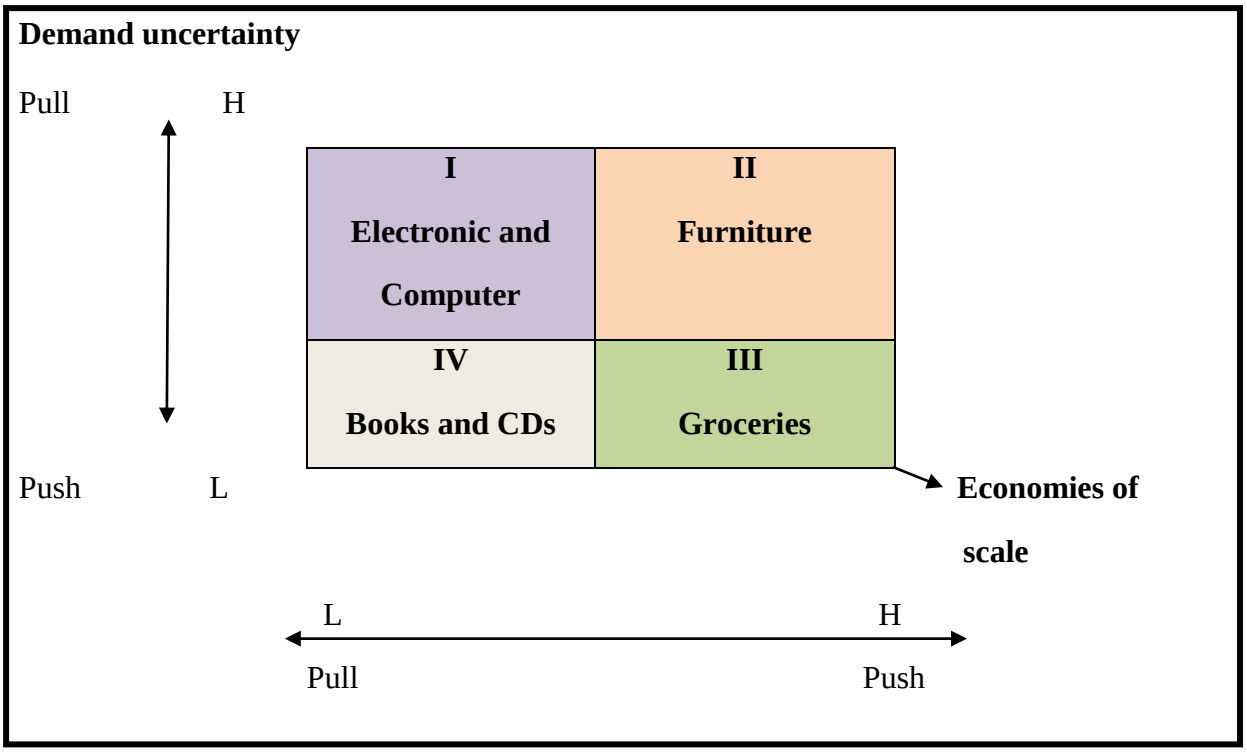
The Internet has also enabled musicians to easily set up their own websites to market their music and distribute their music independently. If musicians want to charge consumers for their music, they can register with Apple iTunes to license to their music and be paid a fee while gaining international exposure with no geographical boundaries. In terms of barriers to entry, newly-developed digital technologies have had a flattening effect on the music industry and have resulted in a large increase in the number musicians entering this industry and operating as independent producers. This has redistributed power in the industry (Hracs, 2012:454-456).

2.8 Supply Chain Competence and Capability

Competitive pressures in the digital environment and changing economic conditions have resulted in many organisations emphasising supply chain competence and capability. As noted previously, Chircu and Kauffman (1999:113) identify three processes in the changes taking place in the market in the form of the: intermediation, disintermediation and reintermediation (IDR) cycle. The authors also identify the four major competitive strategies used in the IDR cycle for intermediaries to gain sustainable competitive advantage in the market: partnering for access, technology licensing, partnering for content and partnering for application development. This section examines the digital supply chain environment and identifies how traditional processes and concepts have been re-introduced in the digital supply chain in the absence of physical inventories. According to Stevenson (2012:27), identifying new or improved products or services or innovations are only two of the many possible strategies to provide value to expanding markets and organisations.

In the music industry, a high degree of pull is appropriate for the products in box 1 of the figure below. In the digital world, the design of the pull system depends on many factors that include product complexity, manufacturing lead times, and supplier-manufacturer relationships. It can be deduced that digital music can be placed in box 1, where the pull effect from the consumer is high. In a push-based supply chain, production and distribution decisions are based on long-term forecasts; whereas in a pull-based supply chain, production and distribution are demand-driven so that they are co-ordinated with true customer demand rather than forecasts (Pienaar and Vogt, 2009; Simchi-Levi *et al.*, 2009).

Figure 2.55: Matching Supply Chain Strategies with Products: The Impact of Demand Uncertainty and Economies of Scale



Source: Simchi-Levi, D., Kaminsky, P. and Simchi-Levi, E. (2009) *Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies*, 3rd ed., New York: McGraw Hill: p. 191.

The absence of physical inventory and dealing with a digital product or file results in a digital supply chain system achieving radical cost minimisation. On some websites, the music available to download is completely free. Furthermore, disintermediation offers multiple benefits including brand, distribution, coverage and management of product complexity (Gallaugher, 2002:89). However while disintermediation creates cost savings; (if the average cost of intermediaries is eliminated) it can create value gaps by removing critical value from the distribution channel. If the value added by the new distribution channel is not equal to or exceeds the value invested, then a value gap will be apparent.

Gallaugher (2002) identifies value gaps in critical competitive resources that results in failure. An alternative is to create a competent supply chain in terms of technology clockspeed, response and flexibility; and a lean and agile, capable supply chain. This is typical in the digital music era where, within a few hours or days of a single track being released by an artist, it can be edited and re-released as an additional track on an album or alternatively, for more popular

commercial play in clubs, lounges and social gatherings. Previously, the remixes would be done in the studio with collaboration with artists who not only had to be physically present, but would have to use the traditional supply chain distribution channels.

2.8.1 Supply Chain Competence (clockspeed, response, flexibility)

Fine, Vardan, Pethick and El-Hout (2002:1) explain that previously, the design of an organisation's value chain consisted of assembling a stable set of suppliers and distribution channels to gain competitive advantage. Continual advancement and innovation in technologies and changes in markets has rendered this approach obsolete. Technology clockspeed is one innovation used to create competitive advantage in the music industry. Simchi-Levi, Kaminsky, and Simchi-Levi (2009:338-339) describe this as the speed at which technology changes in a particular industry. This impacts product design and hence the development chain, which focuses on new product innovation. When a product is important to a customer, the clockspeed is fast and the firm has competitive advantage. Products in this category are characterised by fast technology clockspeed and short product life cycle, high product variety and relatively high margins (Fine *et al.*, 2002; Simchi-Levi *et al*., 2009).

Response, also referred to as quick response, is another characteristic that creates competitive advantage. Stevenson (2012:42) elaborates that it refers to the introduction of improved products and services to the market, and also the ability to deliver existing products and services to a customer.

Flexibility is the ability to respond to change that may be related to alterations in the design features of a product or service, or to the volume demanded by customers, or the mix of products or services offered by an organisation (Stevenson, 2012:42-43). Simchi-Levi *et al.*, (2009:282) identify the following three characteristics of increased flexibility:

- The ability to better react to changes in customer demand;
- The ability to use the supplier's technical knowledge to accelerate the product development cycle; and
- The ability to gain access to new technologies and innovation.

Simchi-Levi *et al.* (2009); and Stevenson (2012) add that these are important issues for competitive advantage in industries where technologies change at a rapid pace.

While it is necessary to incorporate technology clockspeed, response and flexibility into the value chain. Chaffey (2015:200-201) proposes that the threat of new digital products from

established or new organisations is likely to take place where digital product fulfilment occurs over the Internet, as it is provides information services at a lower cost.

2.8.2 Supply Chain Capability (lean and agile)

A lean operation is a flexible system of operation that uses considerably fewer resources (activities, people, or inventory) than a traditional system and lean systems achieve greater productivity, lower costs, shorter cycle times and higher quality than non-lean systems (Stevenson, 2012:619). Lean systems are also referred to as just-in-time systems and derive from a philosophy and methodology that focuses on the elimination of waste (non-value adding activities) and streamlining operations by closely co-coordinating all activities (Pienaar and Vogt, 2009:185). Simchi-Levi *et al.* (2009:455) describe lean manufacturing as a facility which reacts to demands from its downstream facility, indicating a pull-based system. Lean systems have three basic elements: they are demand driven, focus on waste reduction and have a culture that is dedicated to excellence and continuous improvement (Stevenson, 2012:619). Combined with innovative tools, these characteristics create competitive advantage amongst musicians in the music industry (Tidd and Bessant, 2009:112).

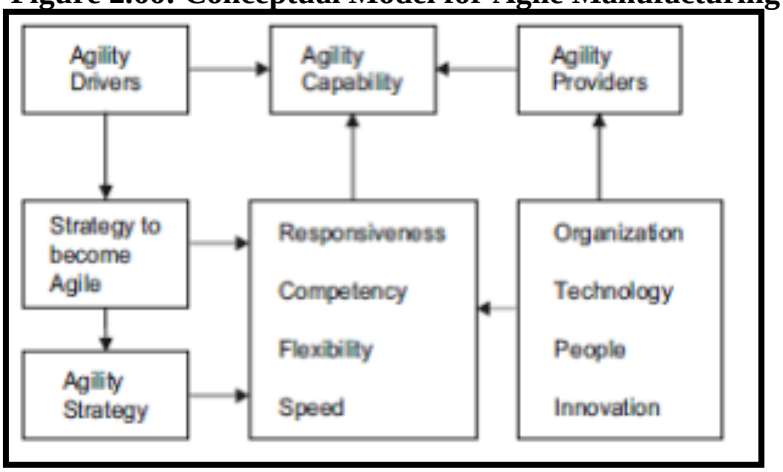
The concept of agility has been used in many different fields to describe supply chains. Since the growth of the Internet, the concept has appeared in Information Technology. Research by Werfs (2013:1) has shown that neither a widely accepted definition nor commonly used frameworks or concepts exist, possibly due to the numerous definitions in the application of agility. Therefore the meaning of agility is context-dependent. Stevenson (2012:26) defines agility as a strategy that involves maintaining a flexible system that can quickly respond to changes in either the volume of demand or changes in product or service offerings or the ability of an organisation to respond quickly to demands or opportunities. Werfs (2013:3) notes that incorporating agility into an organisation's value chain can enable it to:

- React quickly and efficiently to changing market requests;
- Customise products and services more feasibly;
- Deliver new products in a cost-efficient manner;
- Decrease manufacturing costs;
- Increase customer satisfaction; and
- Increase competitiveness.

This is pertinent in the digital world as peer-sharing websites enable consumers to dictate the content they want to appear on websites, as well the ability of service providers to shorten development times for new or improved products and services such as varying output volumes and product mix.

Agile operations are a strategic approach for competitive advantage that emphasises the use of flexibility to adapt and prosper in a changing environment. It entails the blending of numerous distinct competencies such as cost, quality and reliability along with flexibility. The processing part of flexibility includes innovation. The success of an agile operation requires careful planning to achieve a system that includes people, flexible equipment and information technology (Werfs, 2013:4).

Figure 2.66: Conceptual Model for Agile Manufacturing



Source: Werfs, M. (2013) *Agile IT Department – Concepts, Frameworks, Feasibility (Part 1).* [online], available: http://thinkcreative30.wordpress.com/2013/03/01/agile-it-departments-concepts-frameworks-feasibility-part-1/ [3 December 2013].

In the music industry, all three parties (the artist, the sound recording equipment and the digital upload onto websites) align with a responsive digital environment.

2.8.3 Supply Chain Competence and Capability Applied in the Music Industry

The music industry has witnessed artists taking part in the discussion on supply chain competence and capability as a tool for competitive advantage. Two such artists are discussed here.

The first was collaboration between two artists, James Murphy and Patrick Gunderso. They started a project which uses computer algorithms to turn tennis matches into music. Working with developers from the United States Open (US Open) tennis tournament, Murphy transformed games, serves, sets and matches into lurching, bleepy volleying of electronic music (Michaels, 2014:1). Grow (2014:1) adds that this was achieved using the pieces, which sound like free-form synthesizer video-game jams, with rhythms in streaming real time on the US Open website. The original songs are catalogued by date and the players in the match with

visual annotations of when a player scored a point and when the rounds end. The match begins and the track commences with beats that are balanced and intense, yet equal just like the players, without instruments clearly taking the lead. The music pulses steadily until the last half of the track, when the instruments begin to break form as one player takes the lead. The track ends with a soft, high-pitched whistle that sends the defeated player off the court (Grow, 2014:2). Similarly, when an unpopular player beats a top ranked player, the higher noise levels create a series of simple, sweet opening notes that gradually transform into unexpectedly intense, mature songs. Grow (2014:1) notes that the 14 experimental music pieces were created by "remixing" the tournament matches and including weather changes, crowd reactions and hollow point hooks; none which could be achieved in the traditional music industry. This is an experimental genre of electronic music derived from raw data from the tennis matches. The collaborating artists built their own synthesizer-like-interface to tweak each component of the music (Michaels, 2014:2).

This collaboration substantiates the discussion on technology clockspeed, response and flexibility by showing the use of tools to create innovation in music as well as competitive advantage and uniqueness by collaborating to compose a song formulated from volleying at a tennis match.

The second scenario displays the effectiveness of supply chain competence and capability in the industry. With his 2014 Grammy nominated album, *Lazaretto;* Jack White recorded, pressed and distributed the world's fastest record in under four hours. Ross (2014:1) adds that the artist accomplished the task in three hours, fifty five minutes and twenty one seconds and raced off to his record label to engage in the distribution process. In addition to this compelling innovation, his release of the album *Lazaretto* on "Ultra LP" broke conventional vinyl records. According to Gordon (2014:2) the innovative vinyl entails:

- A 180 gram vinyl;
- two vinyl only hidden tracks hidden beneath the centre labels (this has never been done before previously);
- one hidden track plays at 78RPM and one plays at 45 RPM, making this a 3-speed record;
- Side A plays from the outside in (in the history of vinyls, they plays from the inside out;
- dual-groove technology: plays an electric or acoustic intro depending on where the needle is dropped. The grooves hence meet the body of the song.
- There is a matt finish on Side B which portrays the appearance of an un-played 78 RPM record.

- Both sides end with locked grooves;
- The vinyl is pressed in a seldom-used format flat edged format;
- The dead wax area on Side A contains a hand etched hologram, the first of its kind on a vinyl record;
- Absolutely zero compression was used during recording, mixing and mastering;
- It has a different running order from the compact disc version; and
- The LP uses some mixes that are different from those used on the CD and digital versions.

These are remarkable achievements that were accomplished by means of technological innovations. Previously the average time spent recording an album was measured in months.

The traditional value chain treats information as a supporting element of the value-adding processes (recording, reproduction, packaging, promotion, marketing and distribution activities) and not as a source of value. In contrast, a virtual value chain is present when value-adding steps are performed through and with information. For digital music distribution, the product is digital and not physical. Hence the product itself becomes the information. Organisations that create value with digital assets are likely to obtain income through an infinite number of transactions because a song is recorded once, but in its digital medium it can be duplicated or replicated and distributed an infinite number of times at a low cost (Fox, 2004:204). On the other hand, a song recorded once and sold a multitude of times results in increased profits for e-tailers or the artist.

These operational processes are interrelated and provide retailers with the tools they need to be competitive in the marketplace. The ability of service providers and peer-sharing websites to compete through a combination of marketing and operational functions creates competitive advantage by providing what the customer demands. In the music industry, the pull effect is the result of consumer demand for digital music content, and the quicker the service provider obtains and provides the digital content wanted by customers, the more likely it is that they will retain their customer. At present, there are numerous Internet websites where music can be downloaded legally or illegally, for a fee or free of charge. The onus is now on service providers to attract and retain their customer base. Using the operational processes discussed above, retailers and service providers could be at the forefront of product and service design, thereby creating value within the supply chain and enabling continuous improvement.

2.9 Conclusion

During the past decade, the recording industry was found to be manipulating musicans by pilfering most of the royalties from album sales. The development and widespread adoption of new technologies has enabled artists and consumers to fight back. Artists are now able to record their own music and market it on services like Youtube, Myspace, Facebook and a host of peer-sharing websites. This has also made it possible for artists and fans to gain closer links with one another. In the process, record labels become irrelevant. Disintermediation was created in the traditional supply chain distribution process. The Internet and enabling technologies have destroyed the traditional music industry, as shown by the closure of numerous retail shops globally and locally.

As the music industry progressed towards the digital marketspace, alternative marketing and pricing strategies became possible that helped artists to gain some control over the recording industry. Simultaneously, consumers gained leverage as they no longer had to pay for music but could download it from the Internet through complementary technology mediums. Artists are now using the Internet to distribute free music to their fans, thereby increasing fan loyalty. The Internet offered artists a new medium to distribute their music and became a major distribution channel for music which is readily accessible to any consumer, and creates a direct link between the artist and the fan, a facet previously controlled by record labels (Pietila, 2009:247).

Pietila's (2009:230) study on the South African music industry's response to the crippling effects of the digital distribution of music as well as the issue of ownership and control of music rights found that, while the country's music industry is the most advanced in Africa, it could not retain its members. Artists began 'going independent' and 'corporatising their skills' with the aid of the Internet. Pietila (2009:246) notes that "The post-apartheid era has seen a rapid expansion of the independent scene as many musicians and record company employees have decided to start their own labels. This has also meant a brisk appearance and proliferation of black entrepreneurship on a scale unprecedented in the history." This is to the enabling and political environment of the post-apartheid era and artists experiences with copyright and royalty infringements.

This scenario was beautifully captured in the 2014 local music documentary *Future Sound of Mzansi* directed by performance artist Spoek Mathambo and filmmaker Lebogang Rasethaba. The documentary was released at the Durban International Film Festival (DIFF). It explores, expresses and interrogates South Africa's cultural landscape through the vehicle of electronic music (Mathambo and Rasethaba, 2014:1). The documentary shows that artists took over the

entire vertical integration process previously associated with the traditional music industry. Artists recorded their own music, uploaded it onto Youtube and did their own marketing. The result was a home visit from an international producer inviting artists to tour specific continents where their music was growing on fans. This demonstrates the power of the Internet in digital music distribution (Mathambo and Rasethaba, 2014:1). The film also engages with popular pioneers in what is described as "sculpting the sound of things to come." Artists featured include Aero Manyelo, Black Coffee, Christian Tiger School, Felix Laband, John Wizards, Sibot, DJ Spoko and Zaki Ibrahim to name but a few (Mathambo and Rasethaba, 2014:1).

Digital music services began with an open value chain system consisting of interchangeable file sharing networks, PCs, re-mixing software, portable MP3 players, iPods, and digitally compatible playing technologies which extended to mobile phones and Tablets. These components are loosely interchangeable and digital rights management free music files were not tied to specific components. A user or consumer could download music from the network of their choice directly onto their PC, and play it on their choice of technology and software compatible devices like Windows Media Player, iTunes, MP3 players, mobile phones, televisions and home theatre devices.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter identifies and describes the research design used for this study. According to Kumar (2014:23) "research involves systematic, controlled, rigorous exploration and description of what is not known and establishment of associations and causations that permit the accurate prediction of outcomes under a given set of conditions." Sekaran and Bougie (2010) define research as a systematic and organised effort to investigate a specific problem that requires a solution. This chapter outlines the type of design used, the nature of the study, the sampling techniques, the target population, the type of sample and sample size, data collection methods, data analysis and the statistical analysis of the questionnaire.

3.2 Research Design

This study utilises a quantitative exploratory design to explore digital distribution of music in the South African recording industry. According to Cooper and Schindler (2010:102) exploratory research is appropriate when there is a paucity of research on a subject. In this study, it is used to obtain in-depth information on the research topic in order to better understand the phenomenon. Given the limited empirical and theoretical research on the South African music industry, an exploratory design approach is appropriate.

The researcher aims to explore the facets of digital music distribution in order to gain knowledge on this topic to generate and test a hypothesis. The hypothesis determines whether the information presented is based on an exploratory study of digital music distribution, thereby considering knowledge and appropriateness. This enables the researcher to reach conclusions and make recommendations.

3.2.1 Research Approach

A quantitative research design is employed for this study. Quantitative research is designed to evaluate objective data and relies on numerical and statistical data, excluding feelings and opinions (Sibanda, 2009:2). Creswell (2014:4) describes quantitative research as a method used to test theories by examining the relationships among variables. The variables are then measured on instruments so that numbered data can be analysed using statistical procedures and

packages. The purpose of quantitative research is to test hypotheses, examine cause and effect, and make predictions. The researcher isolates variables and relates them to determine the magnitude and frequency of the relationships and to determine which variables to investigate (Sibanda, 2009:2).

3.2.2 Sampling Technique

There are two types of sampling, namely probability and non-probability sampling. The researcher employs non-probability sampling. The non-probability sampling method allows for a specific element to be chosen. The researcher uses purposive sampling, also known as judgemental sampling. Creswell (2014:189) observes that in quantitative research, the researcher purposefully the selects participants or sites (or documents or visual material) that best enables the respondents to understand the problem and research question. This sampling technique does not entail random sampling or the selection of a large number of participants, but is based on the judgement of the researcher regarding the characteristics of a representative sample (Bless, Kagee and Smith, 2006:106). In this research study the sample targeted and comprised of musicians.

In addition to purposive sampling, snowball sampling offers a quicker and more efficient means to gather data. Babbie and Mouton (2006:167) advises that snowball sampling is appropriate when it is difficult to locate the desired number of members of a special population. A few people from the target population are requested to provide information on how to locate other members of that population whom they know. In this way, they serve as informants and assist in identifying colleagues, acquaintances or friends. Just as a snowball increases in size with the accumulation of snow, so too does this sampling technique accumulating respondents for this exploratory research. In coupling purposive sampling with snowball sampling, the researcher will be referred to professionals within the same industry.

3.2.3 Target Population

In order to be able to compose, produce, record and digitally distribute music, the artist or band needs to reside in an urban area. Urban areas are highly developed and offer efficient access to technology, infrastructure, business development, and professionals in the targeted industry as well as wider audiences. According to Statistics South Africa (2014), KZN has the third largest population in SA of 3,442,361 million, representing 19.8% of the total population. Of this population, 84, 4% reside in urban areas, with 14.7% in tribal or traditional areas and the remaining 0.5% lives on farms. The majority of the KZN population has access to cellular

phones (90.7%); while 24.6% have access to computers, 78.5% to television, 32.4% to satellite television, 71.8% to radio and 32.6% to motor vehicles.

More than half of KZN's population (58.8%) does not have access to the Internet with 11.7% accessing the Internet from their homes, 19.1% from their cellular phones, 4.8% from their offices, and 5.7% from elsewhere. The facts that more than 50% of the population of KZN does not have access to the Internet and similar technologies implies that the majority of the musicians within KZN reside in Durban that offers viable technological resources and opportunities to record and distribute music.

Babbie and Mouton (2006:100) describe the population as those people or a group of people who the study is about. As it is impossible to interview all the members of a population of interest, a sample of the population is selected for data collection. The target population for this research study was selected using the Diffusion of Innovation theory's guidelines for sampling. Given (2008:697) notes that researchers who adopt a deductive or theory testing approach, select individuals or cases that embody the theoretical constructs.

In this study, the researcher was guided by the theory of Diffusion of Innovation that was used to reach the targeted musician population in the Durban area. As noted earlier, this theory posits that in order to diffuse technology or the product, musicians need to reside in areas that have access to the resources required to diffuse the innovation.

3.2.4 Type of Sample and Sample Size

The RiSA website states that the association has 250 members in KZN. Although the website does not list members per city, the researcher used deductive logical reasoning together with the theory of Diffusion of Innovation to support the sample size selected. This was achieved by taking into consideration that in order to digitally distribute music, musicians will need to have access to technology-enabling equipment, devices and bandwidth speed. These are available in urban area such as Durban. In addition, the researcher used statistics pertaining to KZN to provide clarity on inhabitants' access to the Internet, technology and other resources that facilitate distribution of and access to digital music. Residents living in urban areas, especially in the city of Durban have access to the appropriate resources required to diffuse an innovation.

Table 3.1: Sample Size for a Given Population Size

Population size (N)	Sample Size (S)	Population size (N)	Sample Size (S)
10	10	160	113
15	14	170	118
20	19	180	123
25	24	190	127
30	28	200	132
35	32	210	136
40	36	220	140
45	40	230	144
50	44	240	148
55	48	250	152
60	52	260	155
65	56	270	159
70	59	280	162
75	63	290	165
80	66	300	175
85	70	320	181
90	73	340	191
95	76	360	196
100	80	380	205
110	86	400	210
120	92	420	217
130	97	440	226
140	103	460	242
150	108	480	248

Source: Sekaran, U and Bougie, R. (2010) *Research Methods for Business: A Skills Building Approach*, 5th ed. United Kingdom: John Wiley and Sons Ltd: Pp. 295 – 296.

Table 3.1 indicates the corresponding sample size for different population sizes. This study made reference to these population sizes in determining the target sample size of 152 participants from the estimated population size of 250 (Sekaran and Bougie, 2010:295). Although a sample size of 152 was required, the researcher was able to obtain a sample size of 217. This is almost 87% of the population size.

Table 3.2 below depicts the composition of the sample.

Table 3.2: Composition of Sample

Biographical Variables		**Frequency**	**Percentage**
Age	18 – 25 years	144	66.4
	26 – 35 years	51	23.5
	36 – 45 years	16	7.4
	46 years and older	6	2.8
	Total	**217**	**100.0**
Gender	Male	106	48.8
	Female	111	51.2
	Total	**217**	**100.0**
Race	African	135	62.2
	Indian	46	21.2
	White	19	8.8
	Coloured	14	6.5
	Other	3	1.4
	Total	**217**	**100.0**
Education	High School	11	5.1
	Matric	84	38.7
	Bachelors' Degree	90	41.5
	Honours	19	8.8
	Masters	6	2.8
	PhD	2	.9
	Other	5	2.3
	Total	**217**	**100.0**
Artist Category	Belong to a label	58	26.7
	Independent artist	119	54.8
	Social music entrepreneur	38	17.5
	Other	2	.9
	Total	**217**	**100.0**
Number of years in the music industry	Less than a year	61	28.1
	1 – 3 years	99	45.6
	4 – 6 years	34	15.7
	7 – 10 years	11	5.1
	Over 10 years	12	5.5
	Total	**217**	**100.0**
Music is distributed by	Myself	151	69.6
	My Label	66	30.4
	Total	**217**	**100.0**
Medium of	Electronic distribution	105	48.4

Distribution	Traditional means	38	17.5
	Both	74	34.1
	Total	**217**	**100.0**
Websites used to distribute music	iTunes	41	18.9
	Social Media Websites	113	52.1
	SAmp3.com	36	16.6
	Napster	11	5.1
	Soundcloud	47	21.7
	Other	14	6.5
	Total	**262**	**120.9**
Music is aligned with	Customer demands	58	26.7
	Label demands	42	19.4
	My own artistic taste	117	53.9
	Total	**217**	**100.0**

Source: Developed by the researcher from data analysis.

Question 9 on the research instrument allowed the respondent to select more than one option hence the frequency and percentage differs from other questions.

3.3 Data Collection Methods

There are two types of data, namely primary and secondary. Primary data refers to the information obtained first hand on the variables of interest for the specific purpose of the study. Sekaran and Bougie (2010:181) note that primary sources include data gathered from targeted individuals using questionnaires and interviews; these are administered by the researcher. Secondary data refers to information gathered from sources that already exist (Cooper and Schindler, 2010:148). In this study, primary data was gathered for empirical analysis while secondary data were accessed by means of textbooks, journals, articles and the Internet.

The researcher selected the survey method of a questionnaire to collect primary data. The questionnaire was designed by the researcher. A questionnaire is a pre-formulated set of questions to which respondents record their answers, usually within closely defined alternatives (Sekaran and Bougie, 2010). The questionnaire comprised of closed-ended questions.

Sekaran (2003) identifies the following advantages of using a questionnaire:

- They can be administered personally, mailed to respondents, or distributed electronically;
- Questionnaires enable the researcher to collect data fairly easily;

- Questions from questionnaires can be easily coded;
- Questionnaires are often a catharsis for respondents; and
- Questionnaires benefit the scientific community if the measures are well-validated and reliable.

3.3.1 Questionnaire Design

According to Bernard (2000:25-67), a covering letter should form part of the questionnaire. The covering letter provides respondents with a clear indication of the purpose of the study, entailing that participation is voluntary and that the respondent is free to withdraw from participating at any time. The letter also guarantees confidentiality. Furthermore, it provides the contact details of the researcher and the supervisor, including an approximate time frame for completing the questionnaire.

The questionnaire is designed using closed-ended questions. Saunders, Lewis and Thornhill (2012:667) describe closed-ended questions as questions where participants choose responses from a limited number of given alternatives. The three main sections of the questionnaire were:

- **Section A**

Section A addressed questions pertaining to the biographical variables of the respondents which are measured on a nominal scale. The variables included age, gender, marital status, race, educational qualifications, tenure, music creation and distribution. These questions, numbered 1-10, requires the respondent to choose their answer from a list of alternatives. Respondents are required to mark an X or circle the most appropriate response category as provided by the researcher.

- **Section B**

Section B contained six dichotomous questions with options of ‘Yes’ or ‘No’ answers. These questions, numbered, 11-16 related to the variables regarding the push-push strategies used by musicians.

- **Section C**

Interval scale or rating questions using a 5-point Likert scaling method comprised Section C. Section C consisted of 22 closed-ended questions relating to the sub-dimensions of digital music distribution. These statements are presented on a 5-point Likert scale ranging from strongly disagree (1), to disagree (2), neutral (3), agree (4) and strongly agree (5). Closed-ended questions allows the researcher to code the information easily for data analysis (Sekaran and

Bougie, 2010). The Likert scale type questions in Section C pertain to the three key independent variables of the study, namely, music distribution, technological value adding innovations related to supply and demand, and the supply chain's competence and capability.

The questionnaire is strategically structured in order to enable data collection across each independent variable. According to Korb (2012:1) a variable is "the key characteristic or attribute of an individual, group, educational system, or the environment that is of interest in a research study." Variables can be straightforward or easy to measure (Section A of the questionnaire), whilst others are more complex (those related to Sections B and C of the questionnaire). Kumar (2014:66) describes independent and dependent variables as follows:

- Independent variable: the cause assumed to be responsible for bringing about change in a phenomenon or situation. The independent variables in this study are music distribution, technology value adding innovations related to supply and demand, and the supply chain's competence and capability
- Dependent variable: the outcome or change brought about by the introduction of an independent variable. The dependent variable identified for the purpose of this research study is digital music distribution. Digital music distribution is a construct of a decentralised distribution.

3.3.2 Measurement Scales

There are three measurement scales namely; ordinal, nominal and interval scales. A scale is a tool that is used to distinguish individuals on the variables of interest to the study (Sekaran, 2003). There are four types of measurement scales/types of data: nominal, ordinal, interval and ration. This study adopts nominal and interval scales. According to McNabb (2004:80-81) "nominal data is simply a naming or classification scale" whereas "a typical use of ordinal data is to measure people's preferences or ranking for services or things". Alternatively, ordinal data can be gathered using Likert scale type questions and interval level data can be ranked and categorised (Waxman, 2013:60-80). An example of nominal data is intervals between kilometres per litre when viewing the economy. Interval data is normally numeric. Black (2011:9) noted that ratio-level data have similar characteristics to interval data. However, ratio data takes into consideration numbers to the absolute zero and the number zero cannot be manipulated. Examples of ratio data are productivity measures, weight and volume.

3.3.3 Administration of questionnaire

Data is collected by administering questionnaires personally and by electronic mail to Durban musicians. Respondents click on the link provided in the e-mail to complete the questionnaire created on the online survey tool known as Google Drive, as recommended. Respondents were requested to return hard or electronic versions of the completed questionnaire. Questionnaires can be described as including all methods of data collection in which each person is asked to respond to the same set of questions in a pre-determined order (de Vaus, 2002; Saunders *et al.*, 2012). Punch (2003) explains that quantitative research is essentially about investigating and understanding how and why variables are related to each other. The researcher has the option of selecting either a concept or a variable or both (Kumar, 2014:63). Please refer to Appendix C to view the research instrument.

3.3.4 In-house Pretesting and Pilot Testing

In-house pretesting and pilot testing was undertaken to enhance the validity of the research instrument and process. The pretesting of a questionnaire should occur prior to final administration in order to uncover any potential shortcomings in the questionnaire design and administration (Remenyi, Williams, Money, and Swart, 2010). The limitations are related to the effectiveness of the questionnaire by determining the strengths and weaknesses with regard to question format, wording and order. The researcher informs the respondents that the pretest is a practice run. Pretesting tests for question variation, meaning, task difficulty, time consumed, and the respondent's interest and attention (Bell, 2010; Saunders *et al.*, 2012). A formal approach to pretesting occurs in the form of a pilot study which is a replication of the full study but on a smaller scale (Saunders *et al.*, 2012:451). By addressing specific aspects of the research, pilot testing helps to determine whether the selected procedures will operate as intended. Hence, it enables the survey questions to be refined and reduces the risk of the main study being flawed. In this study, a pilot test was undertaken with ten musicians.

The pilot study identified two errors. The first was in question 1 where the third option was a repetition of the second option of "26 to 35 years". This error was rectified and option 3 was changed to "36 to 45 years". The second error identified related to question 27, where "complimentary" technologies had been misspelt. This was corrected to "complementary" technologies. No potential problems surfaced once the corrections were made after the pilot phase and the full data collection process followed.

3.4 Data Analysis

Data analysis entails the "application of reasoning to understand the data that has been gathered" (Zikmund, Babin, Carr, and Griffin, 2013:68) and involves breaking up the data into manageable themes, patterns, trends and relationships (Babbie and Mouton, 2006:104). The data analysis techniques used are in accordance with the research study's objectives. The questionnaires are checked to ensure that the respondents had attempted to answer all the questions. Thereafter, each question is coded using numerical values. The numerical values are then assigned to the responses. The data is captured through the SPSS. The statistical findings are analysed and presented as bar charts and histograms in tabulated and graphical forms using both descriptive and inferential statistics. The advantage of using diagrams is the ease with which one is able to interpret and understand the collated information.

3.4.1 Univariate Data Analysis

According to Sekaran and Bougie (2010:338) univariate analysis uses coded data in order to undertake data analysis. It entails the analysis of one variable at a time. Frequency distribution and descriptive statistics are part of this process.

3.4.1.1 Frequency Distribution

Frequency distribution codes each element in the study in order to determine percentages and statistics. The frequencies are shown in tables and percentages are represented in bar graphs. This allows for a thorough description of each scenario. An example of listed frequencies using a table is provided in Chapter 4 as a common indication of biographical questionnaires. The frequency displayed in the table, divide the sample of 217 by ten variables. The frequency shown in the table is graphically represented using a bar graph. A bar graph presents the data by means of bars of vertical sizing. The patterns of graphs vary according to the system or programme used (Bryman and Bell, 2007:357).

3.4.1.2 Descriptive Statistics

Data analysis commences with describing the data by computing a set of descriptive statistics. Descriptive statistics describe the phenomena of interest and involve the transformation of raw data, through ordering and manipulating, into a form that provides information to describe a set of factors in a situation (Bryman and Bell, 2007; Cooper and Schindler, 2008). The goal of descriptive statistics is to provide summary measures of the data contained in all the elements of a sample (Kinnear and Taylor, 1991; Sekaran and Bougie, 2010). Descriptive statistics include

the measures of central tendency (mean, median and mode) and the measures of dispersion (range and standard deviation).

3.4.1.2.1 Measures of Central Tendency

The central point of a measure is described by measures of central tendency (Holt and Lewis, 2010:70). There are three measures of central tendency: the mean, median and mode.

- **Mean**

  The mean (or average) is a "measure of central tendency that offers a general picture of the data without unnecessarily inundating one with each of the observations in a data set" (Sekaran and Bougie, 2010:516). The mean is the sum of a set of scores in the distribution which is divided by the number of observations.

- **Median**

  This is also a measure of location and refers to "the measurement that falls in the middle of the distribution so that there are as many items below as it is above" (Remenyi *et al.*, 2010:211). The median is hence the central item in a group of observations when they are arranged in either ascending or descending order.

- **Mode**

  The mode is the score that occurs most frequently (Sekaran and Bougie, 2010).

The mean, median and mode can be compared to explain the skewness of the distribution. Sekaran and Bougie (2010:316) explain the following conditions that should be observed in relation to the mean, median and mode. If

I. Mean > Median > Mode = Distribution is skewed to the right
II. Mean < Median < Mode = Distribution is skewed to the left
III. Mean = Median = Mode = Distribution is symmetric

In this study, measures of central tendency are computed for each of the dimensions of the questionnaire.

3.4.1.2.2 Measures of Dispersion or Variability

Measures of dispersion indicate how widely the data is spread around the central point of measure (Saunders *et al.*, 2012:684). Apart from establishing the measures of central tendency, the study also seeks to determine the variability that existed in a set of observations. Dispersion

allows for interval and nominal data to be selected for measurement (Rao, 2008:31). The measures of dispersion include the range, variance and standard deviation.

- **Range**

  The range refers to the extreme values in a set of observations. The range is used to calculate the difference between minimum and maximum values in the data set. It is calculated by the highest minus the lowest score value. Since the range is based solely on the two most extreme values within the dataset, if one of these is either exceptionally high or low (sometimes referred to as an outlier), this will result in a range that is not typical of the variability within the dataset. For example, if one student failed to hand in any coursework and was awarded a mark of zero, but sat the exam and scored 40, the range for the coursework marks would now become 48 (48-0) rather than 21. However, the new range is not typical of the dataset as a whole and is distorted by the outlier in the coursework marks. In order to reduce the problems caused by outliers in a dataset, the inter-quartile range is often calculated instead of the range.

- **Variance**

  Variance is a measure of dispersion to determine how isolated the data in a set are. The variance is the square of the standard deviation and is "calculated by subtracting the mean from each of the observations in the data set, taking the square of this difference, and dividing the total of these by number of observations" (Sekaran and Bougie, 2010:317).

- **Standard Deviation**

  Standard deviation is calculated from variance. The standard deviation offers an index of the spread of a distribution and is simply the square root of the variance. Standard deviation shows how much scatter there is in the evidence (Remenyi *et al.*, 2010:212).

In this study, measures of dispersion are used to analyse the responses to Section C of the questionnaire.

3.4.2 Bivariate Data Analysis

Bivariate data is data that has two variables that can change and are compared to find relationships (Sekaran and Bougie, 2010: 307). Saunders *et al.* (2012:266) define statistical inference as "the process of coming up with conclusions about a population on the basis of data describing the sample." Hence, inferential statistics infer something about the population from

which the sample was taken which is based on the characteristics (frequently expressed using descriptive statistics) relating to the sample.

- **Cross-tabulation**

Cross tabulation is "a technique of comparing categorical data from demographic variables and the study's target variables. It uses tables consisting of rows and columns that correspond to the coded values of each variable's category" (Cooper and Schindler, 2008:459). The combination of the variables in rows and columns forms cells which illustrate the groupings of data in order to identify the relationship amongst variables and whether it is independent or not.

When tables are constructed for statistical testing, they are referred to as contingency tables. The purpose of cross-tabulation is to establish a relationship between two variables; if so, the information can be represented in two-dimensional frequency distributions by cross-tabulating the variables. When variables take on different values and cannot be meaningfully cross-tabulated, graphic displays and summary statistics help to describe the extent of the association between the variables. The table below indicates the hypotheses generated in data analysis for cross tabulation:

Table 3.3: Hypotheses for Cross-Tabulation

Hypothesis
H_{o1}: The association between SAmp3.com and digital music distribution does not inspire innovation to the musician.
HA1: The association between SAmp3.com and digital music distribution does inspire innovation to the musician.
Ho2: There is no association between the means and the medium of distribution in the music industry.
HA2: There is an association between the means and the medium of distribution in the music industry.

Source: Designed by researcher from research instrument.

Cross-tabulation is used to tabularise the data from Section A of the questionnaire which relates to biographical information, with other elements of the questionnaire in Sections B and C. The cross-tabulated results were then evaluated against the Chi-Square tests and hypotheses investigated.

➢ Correlation

According to Saunders *et al.* (2012); and Sekaran and Bougie (2010) correlation is the extent to which two variables are related to each other. A correlation coefficient is a "statistical measure of covariation, or association between two variables" (Zikmund *et al.*, 2013:561). "Covariation is the extent to which a change in one variable corresponds systematically to a change in another" (Zikmund *et al.*, 2013:561). A Pearson correlation mix will prove the above by indicating the direction, strength, and significance of the bivariate relationships among all the variables that are measured in the study. Correlation tests whether a relationship exists between the two variables and indicates the nature, strength, and direction of the relationship using Pearson product moment correlation coefficient (Sekaran and Bougie, 2010:321). The correlation coefficient enables the researcher to quantify the strength of the relationship between the two variables.

Pearson's Correlation: Pearson's correlation is employed when a continuous independent and continuous dependent variables are analysed. Pearson's correlation coefficient measures the magnitude and direction of linear association. The measure is represented by the *r* symbol and can take on a range between +1 and -1 (Cooper and Schindler, 2008:510). The magnitude indicates the degree of the relationship to which variables move in unison or opposition. The significance of the sign is only indicative of the direction of the relationship. The decision rule on Pearson's correlation coefficient is that, when the probability associated with the T-statistics is 0.5 or less, the researcher can assume that there is a relationship between the dependent and independent variables. Table 3.4 below displays the range of values, strengths and the direction of the Pearson *r* values:

Table 3.4: Pearson's Correlation

Pearson (*r*)	Strength and Direction
+1	Perfect positive
+0.7	Strong positive
+0.4	Moderate positive
0.0	No relationship
-0.4	Moderate negative
-0.7	Strong negative
-1	Perfect negative

Source: Cooper and Schindler. (2008) *Business Research Methods.* New York: McGraw Hill.

Pearson's correlation coefficient is applied to the variables in Section C of the questionnaire which evaluates the dynamics of music distribution, supply and demand and supply chain competence and capability. Although the instrument does not indicate the predictive power of each variable over the other, the strength and direction of the relationship is used together with the multiple regression models that illustrate model predictors. In this case, Pearson *r* provides greater insight on the strength and direction of the predictor variable that influences the overall regression model.

- **T-test**

The t-test is conducted to check if there are any significant mean differences between two groups on a variable of interest. The t-test can be used to examine the same group prior to and following a treatment. It indicates whether two groups comprising of nominal variables are significantly different from each other with regard to a particular variable (Sekaran and Bougie, 2010:339).

- **Analysis of Variance (ANOVA)**

"An analysis of variance (ANOVA) helps examine the significant mean differences among more than two groups on an interval or ratio-scale dependent variable. The results of ANOVA show whether or not the means of the various groups are significantly different from one another" (Sekaran and Bougie, 2010: 347).

- **Inferential Statistics**

Inference refers to drawing conclusions and testing hypotheses about a population based on the evidence collected in a sample (Walliman, 2001:257). It is important to ascertain if the variable in the sample deviates somewhat from the population; if it does, one needs to determine if the difference is statistically significant or insignificant. Cooper and Schindler (2008:468) state that, "a difference is statistically significant if there is a good reason to believe that the difference does not represent random sampling fluctuations." One method of testing for statistical significance is the development of hypotheses.

Hypothesis testing: When testing for significance, two types of hypotheses are used. The null hypothesis (H_0) is a statement that no difference exists between the two variables under study or that there is no significant difference between the two groups. The alternate hypothesis (H_1) is the exact opposite of the null hypothesis, stating that there is a relationship between two variables or significant differences between two groups (Cooper and Schindler, 2008:458). For this study, the confidence level used was 95% corresponding

to a significance level of $p = 0.05$. If p is less than 0.05, the decision is to accept the alternate hypothesis, concluding that there is a significant difference or relationship between the variables. Hence, the variables reach statistical significance.

- **Chi-square**

The Chi-square test was also be used as an analytical tool. Saunders *et al.* (2012: 666) describe the Chi-square test as a "statistical test to determine the probability (likelihood) that two categorical data variables are associated. A common use is to discover whether there are statistically significant associations between the observed frequencies and the expected frequencies of two variables presented in cross-tabulation."

3.4.3 Multivariate Data Analysis

Multivariate data analysis is a statistical technique used to analyse data that arises from more than one variable. Multivariate analysis is described from two perspectives for this study: namely factor analysis and multiple regression. Factor analysis makes use of tables to obtain summary statistics on variables whilst identifying patterns and trends in the data. These are displayed in graphical plots (Pallant, 2009). Multivariate analysis also seeks to identify relationships between a set of variables, where the purpose is to predict which variable has a contingency effect on another. The corresponding analysis is called multiple regression analysis. Variables are classified as either dependant or independent. A dependant variable is what is being measured in the study and what is affected during the research. It is influenced by the independent variable. An independent variable cannot be manipulated or controlled (Bryman and Bell, 2007). In this study, multiple regression and factor analysis was used to analyse the data. The two methods are discussed in more detail below.

3.4.3.1 Multiple Regression

According to Sekaran and Bougie (2010:350) multiple regression analysis is "an extension of simple regression analysis allowing a metric dependent variable to be predicted by multiple independent variables." Multiple regression analysis also provides an objective assessment of the degree and character of the relationship between the independent variables and the dependent variables.

Cooper and Schindler (2008:548 – 550) state that "Collinearity exists when two independent variables are highly correlated" and these variables have a negative impact on the model. Multiple regression is used when exploring linear relationships between the predictor and the

criterion variable. Multiple regression requires a large number of observations. The number of participants should substantially exceed the number of predictor variables used for regression. In determining if multicollinearity exists in a model, the researcher needs to look at the tolerance and variance inflation factor (VIF) values.

3.4.3.2 Factor Analysis

Factor analysis aims to reduce all the variables to a manageable number of variables that belong together and have overlapping measurement characteristics (Cooper and Schindler, 2008:562). Two techniques are used for factor analysis: namely, principal component analysis and factor analysis. These are similar and produce a small number of linear combinations that capture most of the variability in terms of correlation patterns. The linear combinations of variables are called factors, which account for the variance in data as a whole (Pallant, 2009:181).

Communalities refer to the estimation of the variance in each variable that is explained by the two factors (Cooper and Schindler, 2008:564). It indicates the overall fit among the rest of the variables. Factor extraction methods involve determining the number of factors that best represent the interrelationships among the set of variables. The most common method for factor extraction is component extraction. This method is applied to determine which factors describe the underlying relationship among variables.

Factor analysis was applied to the 22 variables on the 5-point Likert scale. The variables are reduced to manageable factors, which are then measured in terms of sampling adequacy using the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity is applied to confirm that some level of correlation existed among the variables. The table of communalities shows that all the items fit relatively well with each other; this is determined by the extraction value obtained using the statistical software package, SPSS.

Other methods of factor extraction used in this study are Kaiser's criterion and Catell's scree test. These methods reduce the data to minimal influential variables. Kaiser's criterion, also known as the eigenvalue rule, enables a researcher to determine the amount of total variance that is explained by the factor (Pallant, 2009:181). Only eigenvalues greater than 1.0 are retained. The correlation co-efficient are called loadings, whereas eigenvalues are the sum of the variances of the factor values. In this study, six factor loadings are generated by factor analysis. These loadings are labelled accordingly to represent the interrelationships among the set of variables.

Catell's scree test involves plotting each of the eigen values to establish the factors that contribute the most in explaining the variance in the data set. The point at which the shape changes direction indicates a lower degree of explanation of variance by the factors (Pallant, 2009:184).

3.4.4 Reliability and Validity

Instruments must fulfil two criteria in order for the research to be scientific: validity and reliability. Both reliability and validity should be present in all measurements and contribute to the credibility of the research findings. It is important to ensure that the research instrument used to measure the variables is able to provide relevant and accurate information. The researcher established the reliability and validity of the measures.

3.4.4.1 Validity

There are two main forms of validity: internal and external validity. Internal validity measures exactly what it was designed to measure (Cooper and Schindler, 2010:289); whereas external validity is generalised to various factors which need to be measured. Cooper and Schindler (2010) Saunders *et al.* (2012); and Sekaran and Bougie (2010) define validity as the extent to which a data collection method or methods accurately measures what it is designed to measure. Validity tests how well an instrument measures the specific concept it set out to measure. Saunders *et al.* (2012:429-430) categorise validity tests as follows:

- **Content validity** ensures that the measures include a sufficient and representative set of items that tap the concept. This type of validity is suitable for judgement methods and evaluations from the panel;
- **Criterion-related validity** exists when the measure differentiates individuals on a criterion it is expected to predict. This type of validity is suitable for correlation; and
- **Construct validity** tests how well the results from the measure suit the theories around which the test is designed. Construct validity is suitable for judgement, factor analysis, multivariate analysis and correlation analysis. Content validity was used to test validity as it was also used as a test to ensure that an adequate set of items was used to measure the concept.

The validity of the questionnaire is assessed using factor analysis. According to Zikmund *et al.* (2013:595) factor analysis "statistically identifies a reduced number of factors from a large number of measured variables." Factor analysis is a general description for a specific computational technique, with the intention of reducing many variables to a convenient number that belongs together and has overlapping measurement characteristics. Factor analysis also

indicates whether the dimensions are tapped by the questions in the survey, and examines the analysis of the inter-relationships between variables as measured by their correlations (Remenyi *et al.*, 2010:223). As validity measures how well a technique, instrument, or process measures a particular concept, the results of factor analysis show whether the theorised dimensions emerge and reveal whether the theorised dimensions are indeed tapped by the measure (Sekaran and Bougie, 2010:160).

3.4.4.2 Reliability

The reliability of a measure indicates the extent to which it is without bias and hence, ensures consistent measurement across time and across the various items in the instrument. In other words, the reliability of a measure is an indication of the stability and consistency with which the instrument measures the concept and helps to assess the 'goodness' of a measure" (Sekaran and Bougie, 2010:161). Reliability and validity normally work together. Error needs to be eliminated with reliability as a measure of goodness as it utilises numerous elements and instruments which are tough and can withstand flexibility and change (Cooper and Schindler, 2010:293).

In this study, reliability was assessed using Cronbach's Coefficient Alpha. Cronbach's Alpha is a reliability coefficient that indicates how positively correlated items are within a set, and determines whether the items in the instrument are homogenous and therefore reflect the same ideas. The closer Cronbach's Alpha is to 1, the higher the internal consistency reliability (Sekaran and Bougie, 2010:324).

3.5 Limitations of the Study

The researcher's attempts to access the RiSA website from October 2014 were not successful. Thereafter, several attempts were made to telephonically contact the RiSA with limited success. The researcher was informed that there was no "downtime" on their website and it was still operating and functioning. However, this was not the case (please refer to Appendix B for a view of the RiSA's active website, and screenshot of a recent attempt to access the RiSA's website that is currently inactive). As the membership is listed on the RiSA website that was not accessible, the researcher personally approached Durban musicians at live music venues, music concerts, the UKZN School of Music, via social media websites and e-mail in order to obtain the quota of respondents. Using this approach, the sample size of the target population was 152; however, with the use of snowballing, a sample size of 217 was obtained.

3.6 Conclusion

This chapter discusses the research methodology and statistical methods employed to analyse the data obtained from the questionnaire. A questionnaire is used as a tool for data collection by means of electronic mail. This study utilises both descriptive statistics and inferential statistics to analyse the responses to the questionnaire. In terms of the psychometric properties of the questionnaire, validity is assessed by means of factor analysis and reliability is assessed using Cronbach's Coefficient Alpha.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents the results of this quantitative research study. Two hundred and seventeen (217) respondents participated in this study, and a questionnaire was used as a survey instrument to obtain information from the respondents. The respondents belong to the music industry and the questionnaire was administered via e-mail, social media websites, and in some instances personally at live performances. No questionnaires were spoiled. The data was captured and analysed using the Statistical Package for Social Science (SPSS) software system. The three data analysis techniques used were univariate, bivariate and multivariate data analysis. The sequence of data analysis in this chapter follows these three techniques to examine the variables in the study. The chapter analyses the constructs in the study to gain insight into digital music distribution among Durban-based musicians.

4.2 Univariate Data Analysis

Univariate analysis is used to code and enter data in order to undertake data analysis (Sekaran and Bougie, 2010:338). It involves the analysis of one variable at a time. The measuring tool that encompasses univariate data analysis includes frequency distributions and descriptive statistics.

4.2.1 Frequency Distribution

Frequency distribution and descriptive statistics were used to analyse the quantitative data by analysing one variable at a time. The following frequency distribution figures provide diagrammatic summaries of the biological data obtained in Section A of the questionnaire. A total of 217 respondents answered the questionnaire. Frequency distribution tables are presented on age, gender, race, educational qualifications, artist category, tenure as a musician, the distribution of music, medium of music distribution, websites used to distribute music; and the musicians' music alignment. A summarised frequency distribution table (Appendix D) illustrates the responses on the dimensions of the questionnaire.

Figure 4.1: Distribution by Age

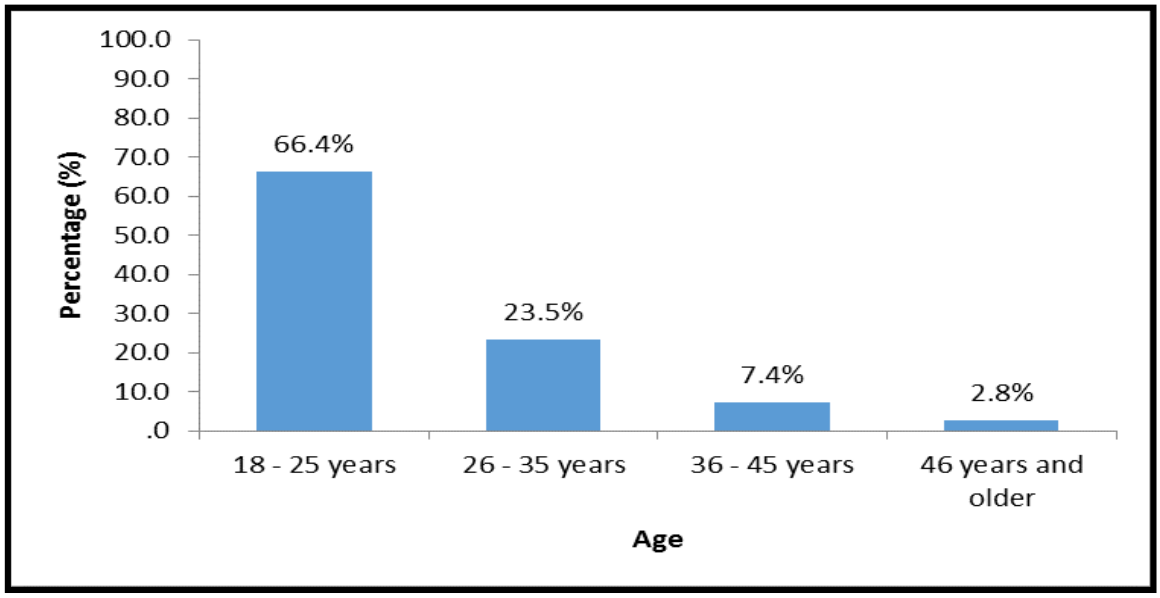


Figure 4.1 shows that a significant portion of the sample (66.4%) consisted of individuals between the ages of 18 and 25 years, with 23.5% between 26 and 35 years old. Respondents between the ages of 36 and 45 comprised 7.4% of the respondents and the remaining 2.8% of the respondents were 46 and older.

Figure 4.2: Distribution by Gender

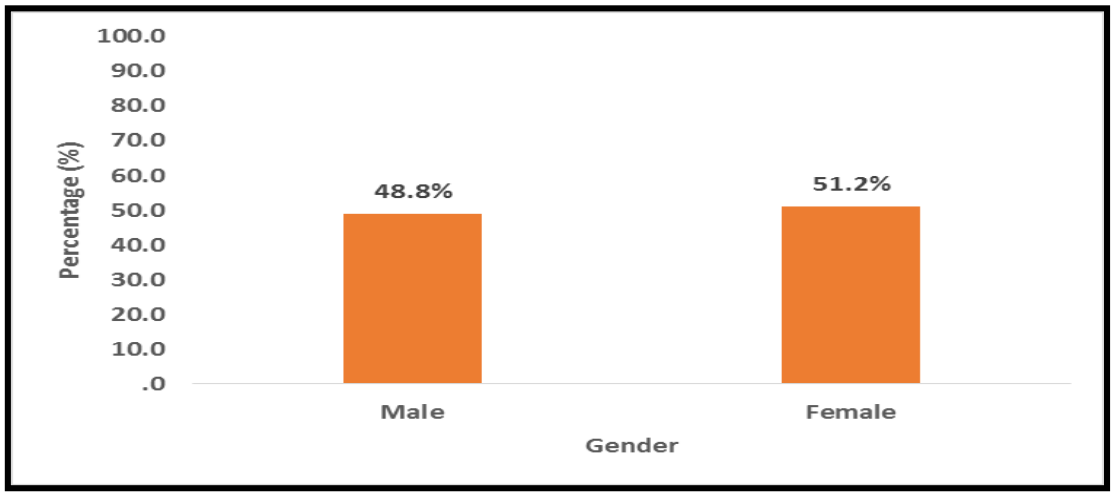


Figure 4.2 illustrates that 51.2% (111 out of 217) of the respondents are female, with an almost equal number of male respondents at 48.8% (106 out of 217).

Figure 4.3: Distribution by Race

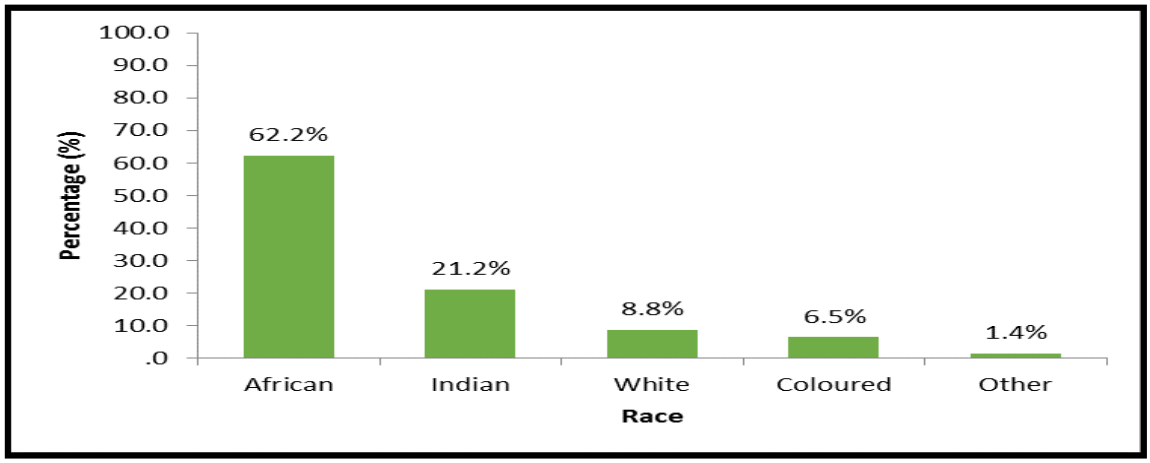


Figure 4.3 shows the majority of the respondents are African (62.2%), while 21.2% are Indian, 8.8% white, and 6.5% Coloured, with the least number of respondents falling into the "Other" category (1.4%).

Figure 4.4: Distribution by Educational Qualifications

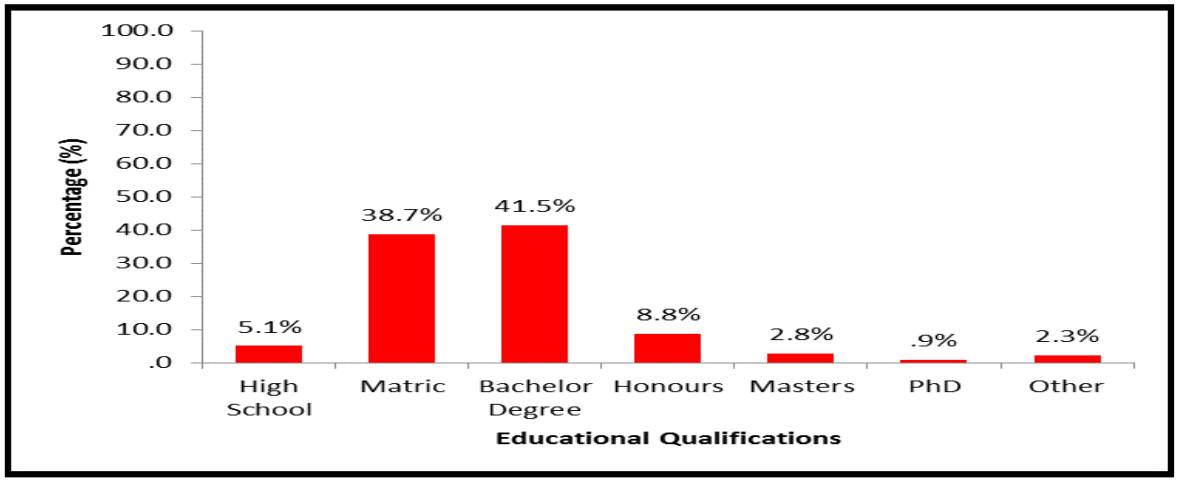


Figure 4.4 shows that a significant portion of the sample had a Bachelor's Degree (41.5%); while 38.7% had a Matric certificate; and 5.1% had a high school qualification. An Honours degree was held by 8.8% of the sample; with 2.8% possessed a Master's Degree and 0.9% had a Doctorate. The "Other" category is represented by 2.3% of the sample, and it could represent lower primary or no education at all.

Figure 4.5: Distribution by Artist Category

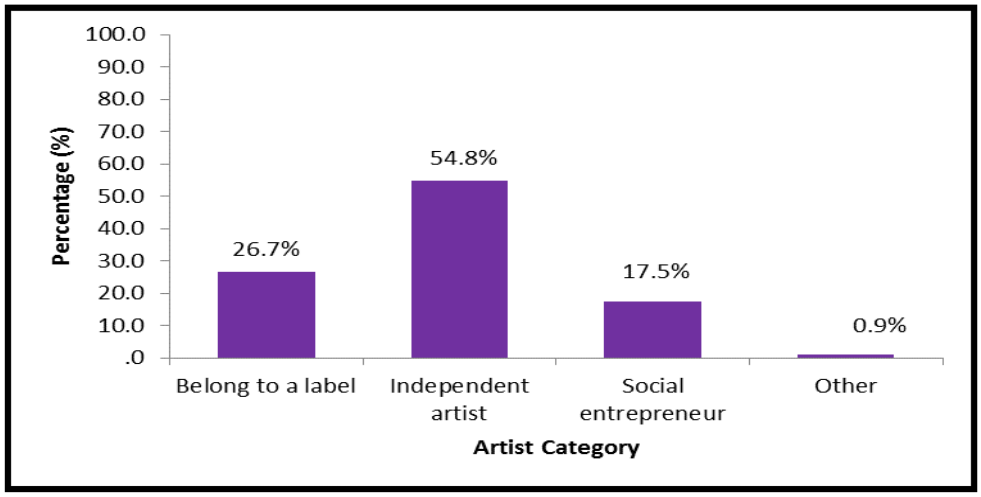


Figure 4.5 illustrates that only 26.7% of the sample belonged to a record label, while 54.8% of the respondents considered themselves to be independent artists. Social entrepreneurs represent 17.5% of the population while the remaining 0.9% belong to the "Other" category.

Figure 4.6: Distribution by Tenure

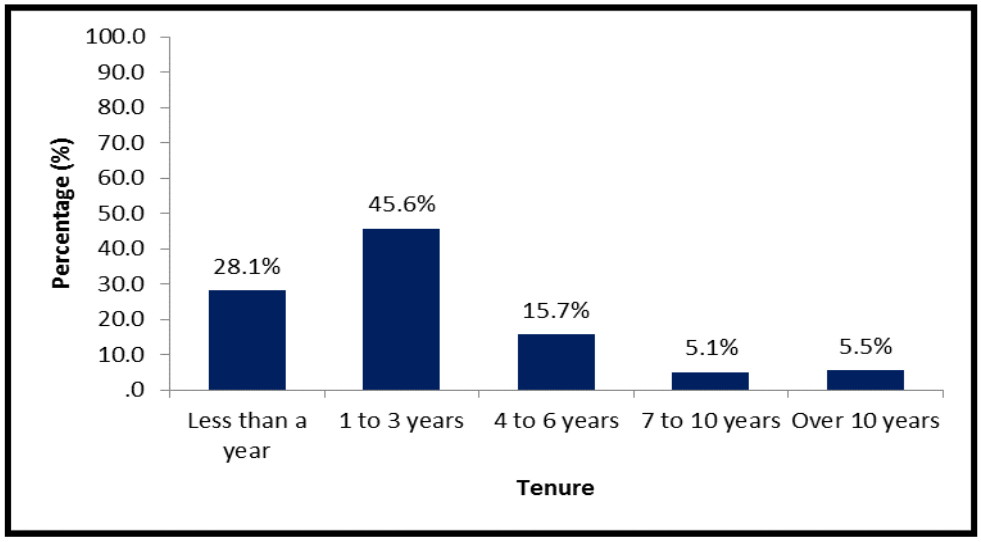


Figure 4.6 shows that 28.1% of the sample had less than a year's experience in the music industry, while 45.6% had one to three years' experience, 15.7% had four to six years' experience and 5.1% had seven to ten years' experience. Musicians with more than ten years' experience represent 5.5% of the sample.

Figure 4.7: Distribution by Music Distribution

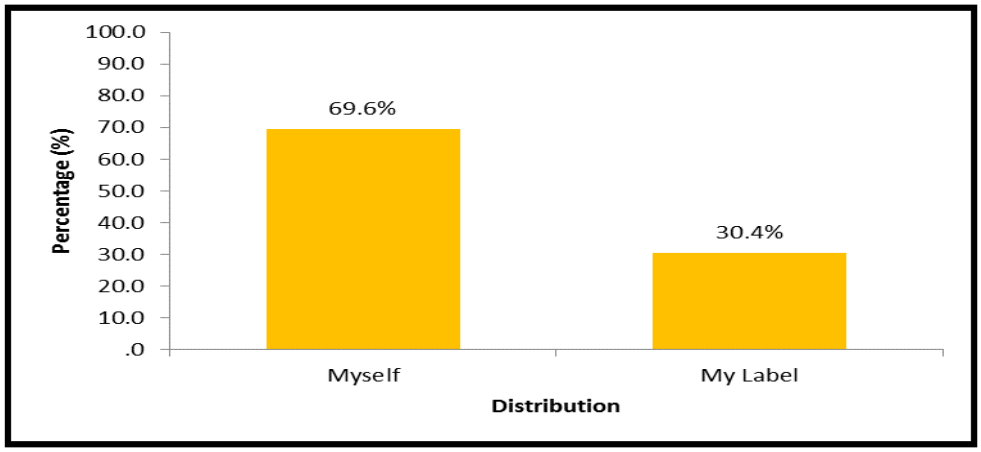


Figure 4.7 shows that distribution by the artist is significantly higher (69.6%) than distribution by record labels (30.4%).

Figure 4.8: Distribution by Medium of Distribution

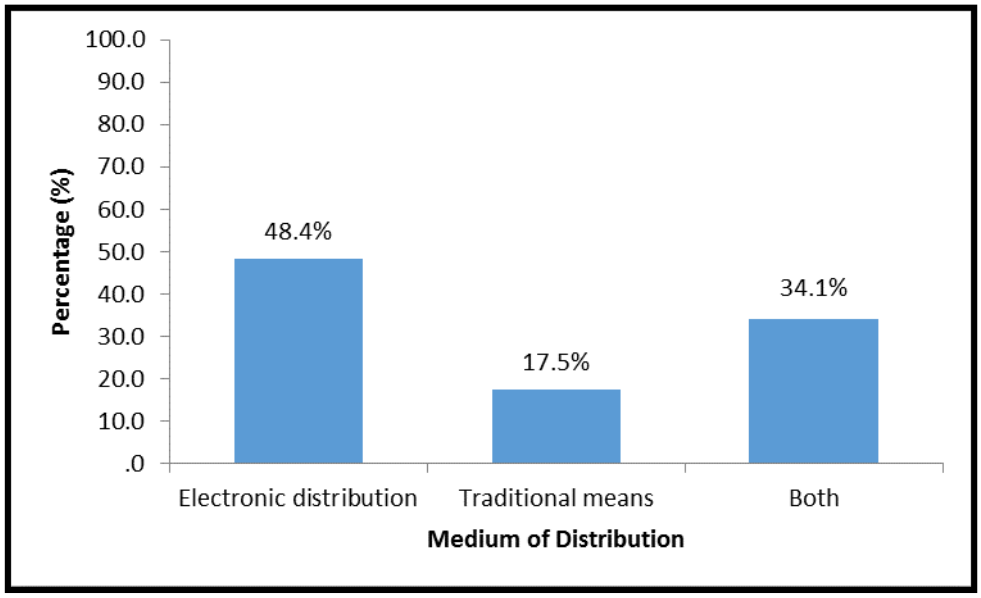


Figure 4.8 shows that the least utilised distribution medium used by musicians is traditional means (17.5%). The most common medium is electronic distribution (48.4%); however 34.1% of the sample reported that they used both electronic and traditional means of distribution.

Figure 4.9: Websites Used to Distribute Music

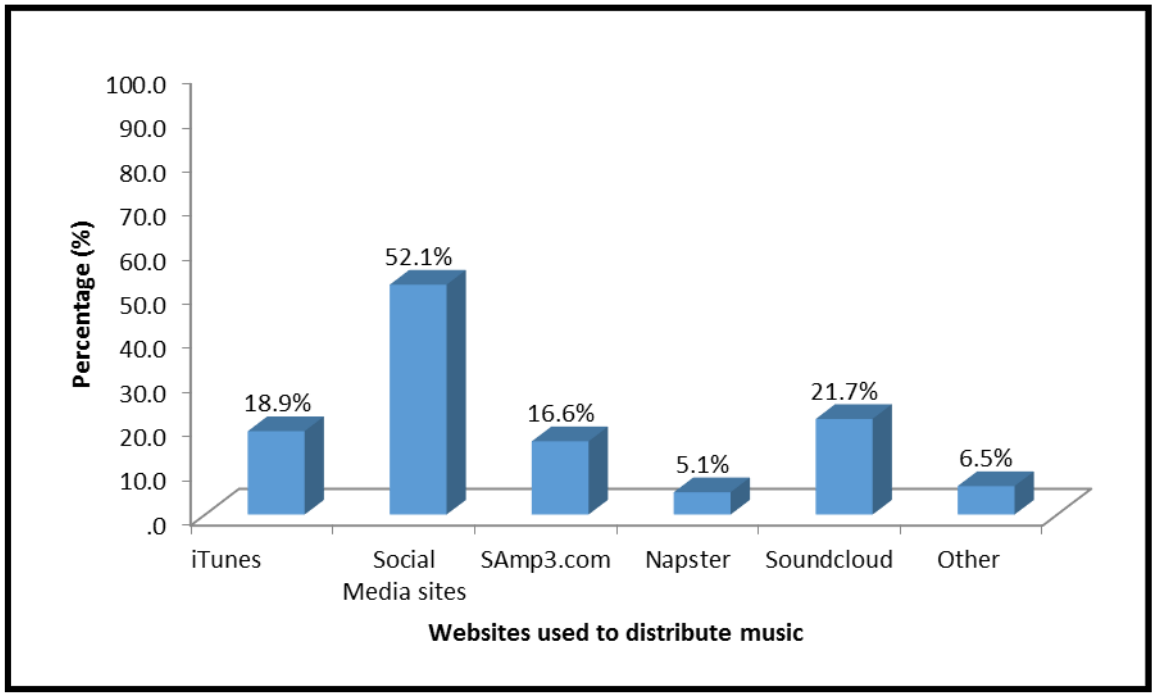
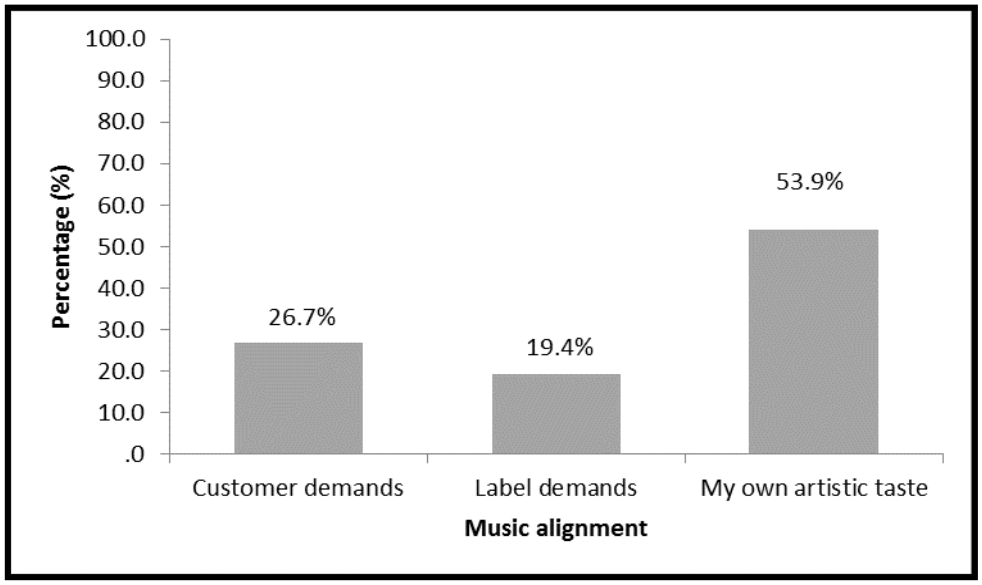


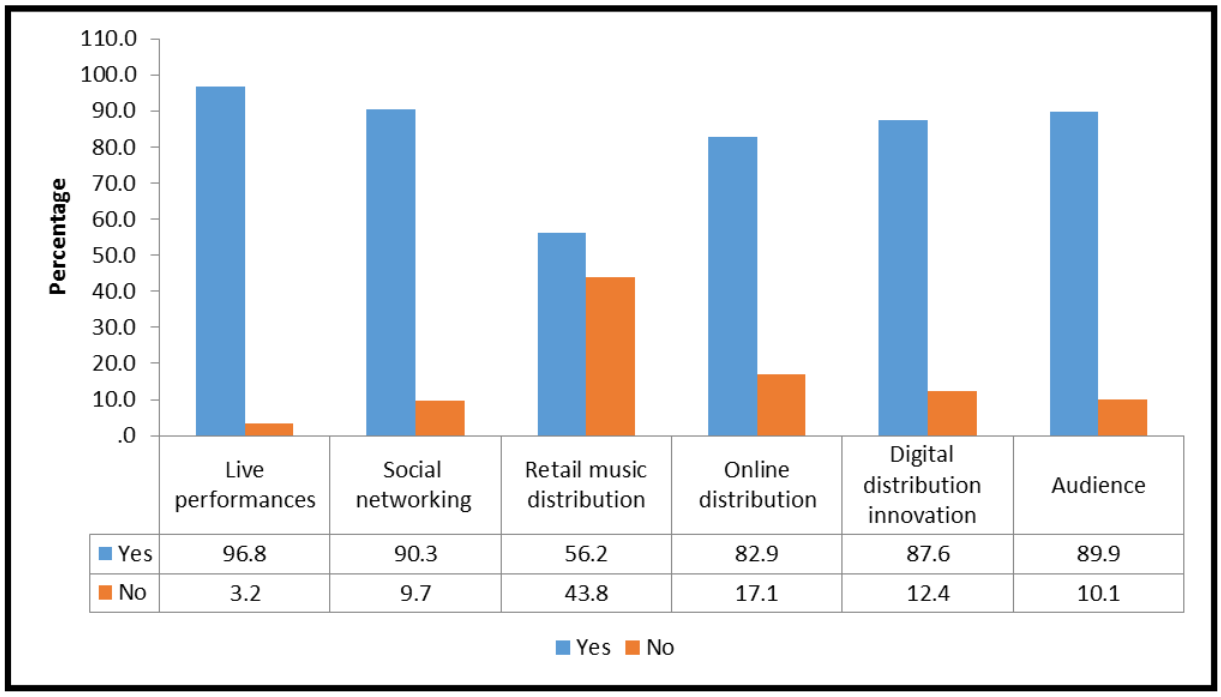
Figure 4.9 shows that more than half of the respondents used social media sites (52.1%) to distribute their music, while 21.7% used Soundcloud and 18.9% used iTunes. Surprisingly, SAmp3.com was not the most popular and was cited by only 16.6% of the respondents. The new Napster, the first website which created disintermediation in the music industry, is at the lower end of the scale (5.1%). Some of the "Other" categories at 6.5% mentioned by respondents were YouTube, reverberation, amazon.com, bandcamp.com, cdbaby, and datafilehost.

Figure 4.10: Distribution by Music Alignment



The analysis of the distribution by music alignment revealed that 53.9% of the respondents created music according to their own artistic taste, while 19.4% responded to label demands and 26.7% responded to customer demand.

Figure 4.11: Dichotomous Questions Relating to Push-Pull Strategies

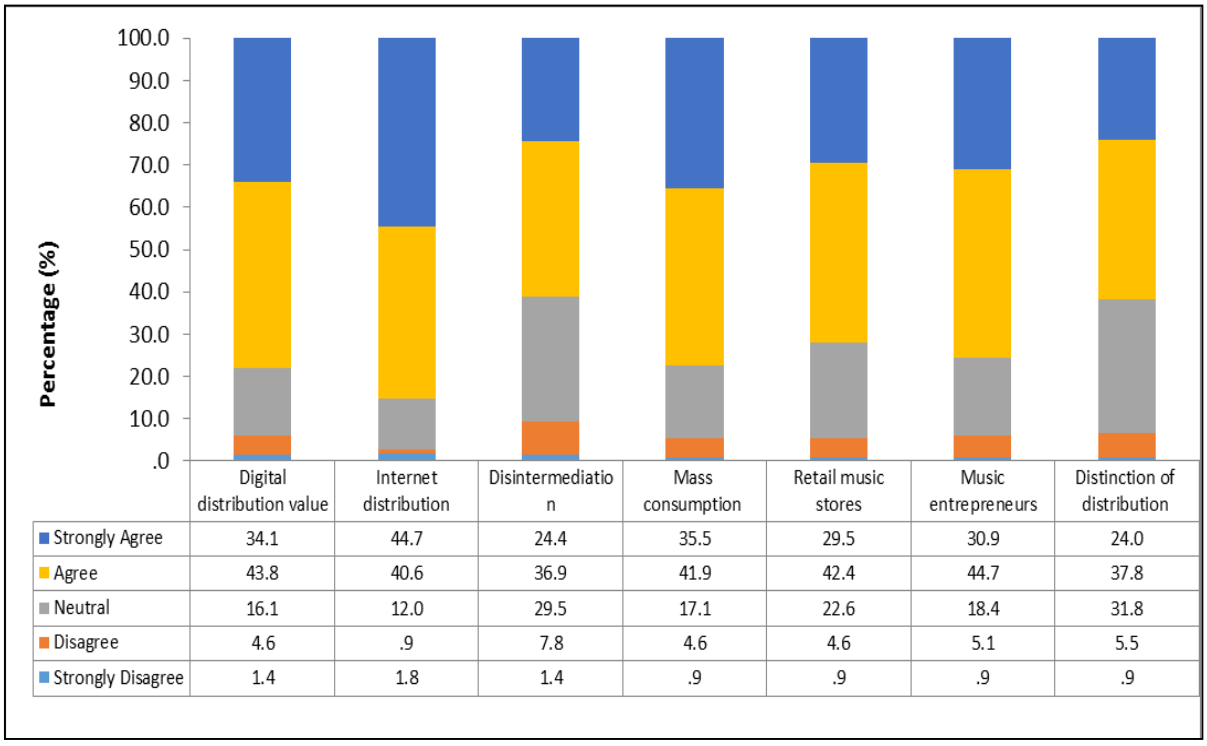


	Live performances	Social networking	Retail music distribution	Online distribution	Digital distribution innovation	Audience
Yes	96.8	90.3	56.2	82.9	87.6	89.9
No	3.2	9.7	43.8	17.1	12.4	10.1

Figure 4.11 depicts the responses to the dichotomous questions posed to the respondents. The binomial test for the dichotomous questions in figure 4.11 shows that a significant number of

the respondents (96.8%) indicated that they used live music performances as a promotional activity while 3.2% stated that they did not do so. Similarly, the overwhelming majority of the respondents indicated that social networking mediums increase the market base for music distribution (90.3%) while 9.7% did not find social networking relevant. For non-virtual approaches, 56.2% of the respondents indicated that retail music stores facilitate easy access to music distribution; however, a similar percentage (43.8%) did not agree with this statement. A large proportion of the respondents agreed that online music stores better facilitate access to music distribution (82.9%) while the remainder disagreed. Underpinning this view, 87.6% of the respondents agreed that digital music distribution inspires innovation in musicians and 89.9% felt that the availability of online music attracts a wider audience. Based on the analysis of push-pull strategies, the respondents were in general agreement on the strategies used in the music industry.

Figure 4.12: Likert Scale Analysis on Music Distribution



	Digital distribution value	Internet distribution	Disintermediation	Mass consumption	Retail music stores	Music entrepreneurs	Distinction of distribution
Strongly Agree	34.1	44.7	24.4	35.5	29.5	30.9	24.0
Agree	43.8	40.6	36.9	41.9	42.4	44.7	37.8
Neutral	16.1	12.0	29.5	17.1	22.6	18.4	31.8
Disagree	4.6	.9	7.8	4.6	4.6	5.1	5.5
Strongly Disagree	1.4	1.8	1.4	.9	.9	.9	.9

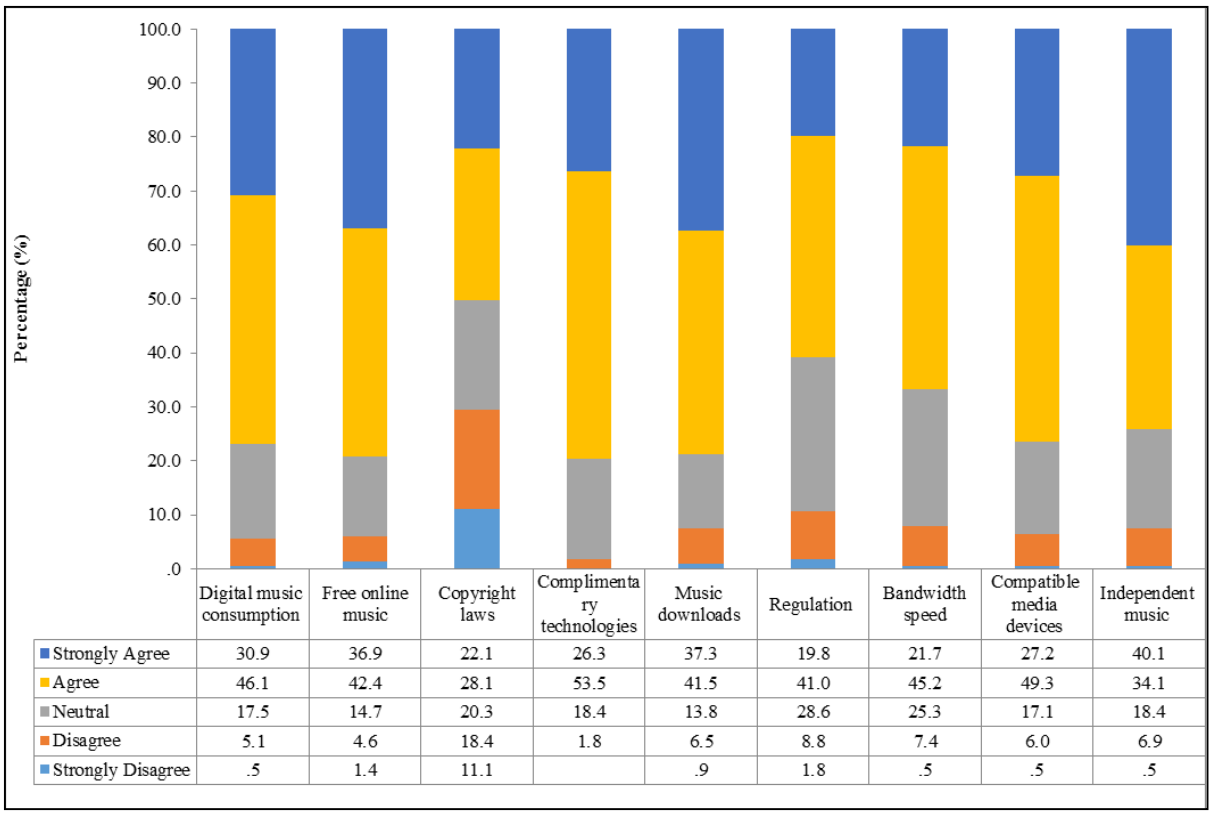
The stacked columns depict the responses to the first sub-section in section C of the questionnaire where the questions were based on a 5-point Likert scale. This component of section C focused on the respondents' significant agreement or disagreement with seven variables influenced by digital music distribution. A statistically significantly large portion of the respondents (43.8%) agreed that digital music distribution has added value in the growth of the South African recording industry; while 34.1% strongly agreed. Less than a combined 10%

of the respondents disagreed (4.6%) or strongly disagreed (1.4%) with the statement; however 16.1% remained neutral.

A significant 44.7% of the population strongly agreed that the Internet has advanced the methods of digital music distribution; while 40.6% agreed; and 12.1% remained neutral; however, 0.9% disagreed and 1.8% strongly disagreed. Furthermore, 36.9% of the respondents agreed that the Internet has taken over the role of record labels in managing of musicians and 24.4% strongly agreed; however 7.8% of the respondents disagreed and 1.4% strongly disagreed with the statement, while 29.5% remained neutral.

An overwhelming number of respondents (77.4%) agreed that the Internet has contributed to the mass consumption of online music. Furthermore, 42.4% of the respondents agreed that the Internet has reduced the number of physical music retail stores. The highest positive response in this sub-section is revealed in the 44.7% of the respondents that agreed that the Internet plays a role in both the creation and promotion of music entrepreneurs. Although many respondents (31.8%) remained neutral on the question of whether there is a distinction between traditional music distribution and digital music distribution, 37.8% agreed that there was a distinction. Figure 4.12 illustrates that the respondents were significantly agreed that the Internet is a medium of digital music distribution.

Figure 4.13: Likert Scale Analysis - Supply and Demand



	Digital music consumption	Free online music	Copyright laws	Complimentary technologies	Music downloads	Regulation	Bandwidth speed	Compatible media devices	Independent music
Strongly Agree	30.9	36.9	22.1	26.3	37.3	19.8	21.7	27.2	40.1
Agree	46.1	42.4	28.1	53.5	41.5	41.0	45.2	49.3	34.1
Neutral	17.5	14.7	20.3	18.4	13.8	28.6	25.3	17.1	18.4
Disagree	5.1	4.6	18.4	1.8	6.5	8.8	7.4	6.0	6.9
Strongly Disagree	.5	1.4	11.1		.9	1.8	.5	.5	.5

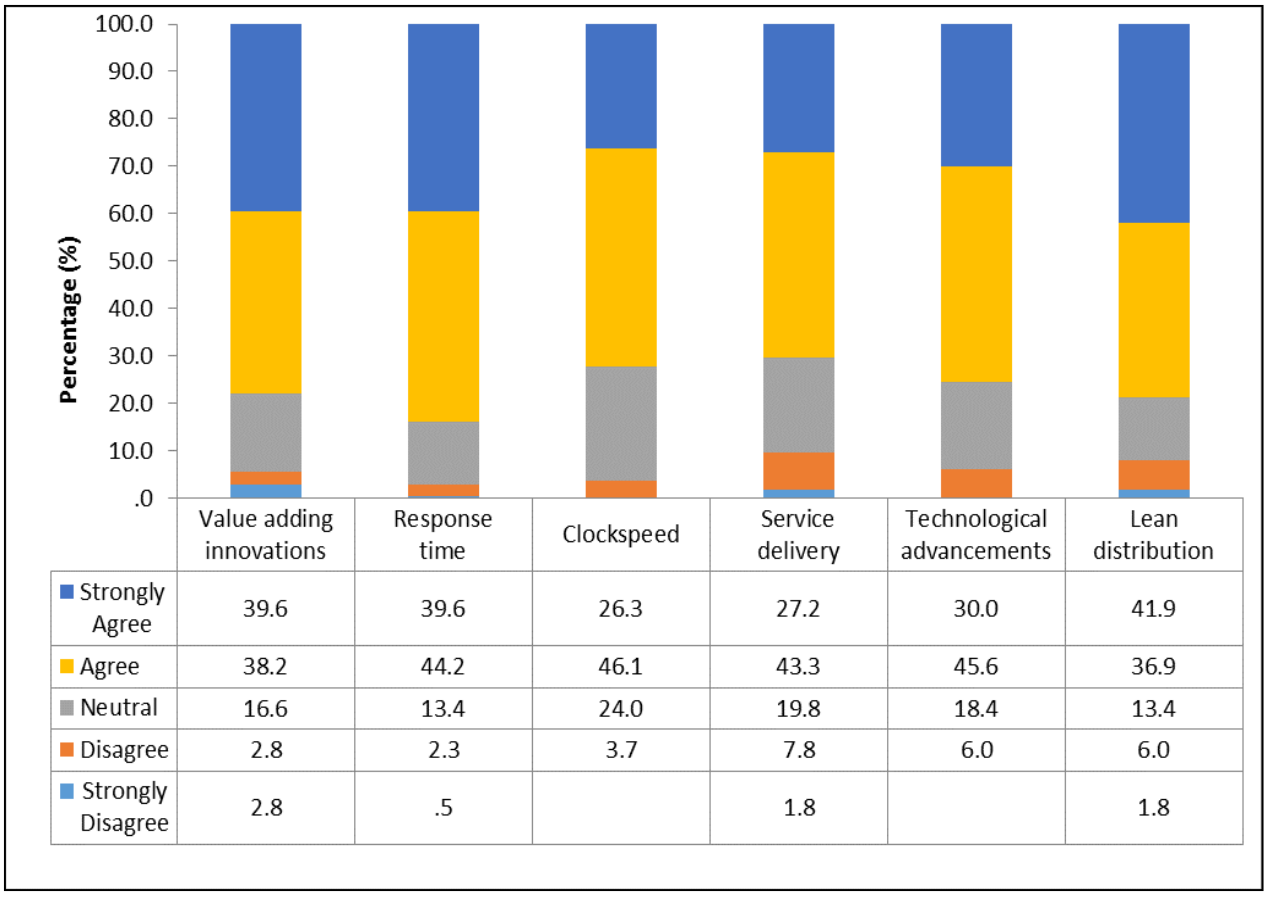
Figure 4.13 illustrates the responses to the questions in the second sub-section of section C of the questionnaire. This focused on respondents' agreement or disagreement with 11 questions on the supply and demand of digital music distribution.

Seventy-seven per cent of the respondents agreed that digital music distribution methods have transformed the consumption of music. While 5.6% of the respondents disagreed that the consumption cycle is influenced by the digital distribution of music, 17.5% remained neutral. A significant number of respondents (79.3%) agreed that free online music leads to further music consumption, while 14.7% remained neutral and 6% indicated that free online music does not lead to further music consumption. Figure 4.13 shows that 28.1% of the respondents agreed that current copyright laws provide adequate protection of artists' music rights, with 22.1% strongly agreeing with this statement. However, 18.4% of the respondents disagreed with this statement, 11.1% strongly disagreed and 20.3% remained neutral.

A small number of respondents disagreed that complementary technology adoption influences customers to listen to more online music; however, more than half the respondents (53.5%) agreed and 26.3% strongly agreed that complementary technology influences music downloads. Moreover, 78.8% of the respondents agreed that the high level of music downloads is influenced by modular technological developments such as smartphones, while 7.4% disagreed with this statement and 13.8% remained neutral. Forty one per cent of the respondents agreed that regulation and closure of various digital distribution services would reduce illegal downloading of music and 19.8% strongly agreed whereas 10.6% of the respondents felt that regulation and closure of illegal music sites would not reduce the illegal downloading of music.

A significant number of respondents (66.9%) agreed that access to high bandwidth speeds influences online downloads; while 25.3% did not express an opinion. The remaining 7.9% of the respondents did not think that access to high bandwidth speeds will encourage music downloads. Furthermore, only 6% of the respondents disagreed and 0.5% strongly disagreed that access to technological compatible media devices influences online downloads, with the majority (49.3%) agreeing and strongly agreeing (27.2%) with this statement. Similarly, 74.2% of the respondents agreed that technological advancements encourage independent music production, while 18.4% remained neutral and 7.4% disagreed with this statement. Figure 4.13 illustrates that respondents were in significant agreement that on the supply and demand strategies used in digital music distribution in the music industry.

Figure 4.14: Likert Scale Analysis - Supply Chain Competence and Capability



	Value adding innovations	Response time	Clockspeed	Service delivery	Technological advancements	Lean distribution
Strongly Agree	39.6	39.6	26.3	27.2	30.0	41.9
Agree	38.2	44.2	46.1	43.3	45.6	36.9
Neutral	16.6	13.4	24.0	19.8	18.4	13.4
Disagree	2.8	2.3	3.7	7.8	6.0	6.0
Strongly Disagree	2.8	.5		1.8		1.8

Figure 4.14 illustrates the responses to the questions in the third sub-section of section C of the questionnaire. The final component of section C illustrates the respondents' significant agreement or disagreement with 11 questions on supply chain competence and capability. An equal number of respondents strongly disagreed (2.8%) and disagreed (2.8%) that the introduction of innovative products (such as iPads) or services (iTunes), adds value to music. An overwhelming 77.8% of the respondents agreed that innovative products add value to music. By the same token, 83.8% of the respondents agreed that music tracks can be re-mixed and uploaded in less time than during the CD era, reducing the response time, while a small number of respondents (2.8%) did not think that music files can be edited and uploaded in a short period of time. An interesting observation is that none of the respondents strongly disagreed that the digitalisation of music enables quick/swift response to changing demands; however 3.7% disagreed.

The majority of the respondents (72.4%) agreed that the digitalisation of music enables quick/swift response to changing demands. Figure 4.14 shows that 70.5% of the respondents agreed that the Internet is reliable in the delivery of both music products and services; while

9.6% did not agree with this statement and 19.8% did not express an opinion on this issue. Thirty per cent of the respondents agreed and a further 45.6% strongly agreed that technological advancements have facilitated the evolution of digital music, with 6% of the respondents not agreeing with tis statement. Finally, 7.8% of the respondents disagreed that the Internet is the most effective way to continuously provide updated or new music offerings to the consumer; however, a significant 78.8% agreed that the Internet is reliable in offering new music. Thus, there is overwhelming evidence that the respondents were in significant agreement on supply chain competence and capability in digital music distribution.

4.2.2 Descriptive Statistics

According to Longerneck (2010:78 – 81) "the two most common numerical descriptive measures are measures of central tendency and measure of variability. Among the measures of central tendency are mode (the measurement that occurs most frequently); median (the middle value when data is arranged from lowest to highest); and the mean (average value within the dataset)". The descriptive statistics table reveals a range of 4. The minimum value is 1 and the maximum value is 5 from a sample of 217. The table below provides information on the mean, standard deviation, skewness and kurtosis figures that describe the nature of the variables investigated. The values listed in Table 4.1 are discussed in terms of the variables which were measured on 5-point Likert scale. The results reflect the mean values in descending order.

Table 4.1: Descriptive Statistics on Music Distribution

	Internet distribution	Mass Consumption	Digital distribution value	Music entrep.	Retail music stores	Distinction of distribution	Disintermediation
N	217	217	217	217	217	217	217
Mean	4.25	4.06	4.05	4	3.95	3.78	3.75
Median	4	4	4	4	4	4	4
Mode	5	4	4	4	4	4	4
Std. Deviation	0.842	0.89	0.901	0.885	0.888	0.905	0.959

The interval interpretation of descriptive statistics makes reference to the effects of digital music distribution as a variable. This indicates that the factors considered depict possible concerns relating to digital music distribution among Durban-based musicians. The highest recorded mode value of 5 was encountered with Internet distribution where the highest mean value (m=4.25 and standard deviation=0.84) imply that the Internet has advanced the methods of distributing music. A large majority of the respondents significantly agreed that the Internet has

contributed to huge consumption of music online. This has the second highest mean value (m=4.06 and standard deviation=0.89) recorded for this component.

A large majority of the respondents concurred that the digital distribution of music has added value in the growth of the South African recording industry (m=4.05 and standard deviation=0.9), thereby indicating the value offered by digital distribution. The factor music entrepreneurship showed a mean value of 4 (m=4 and standard deviation=0.86), indicating that a large majority of the respondents confirmed that the Internet plays a role in both the creation and promotion of music entrepreneurs. The respondents indicated that Internet systems have reduced the number of physical music retail stores (m=3.95 and standard deviation=0.89) by replacing physical products with digital online products. The results also reveal a significant distinction between manual music distribution and digital music distribution (m=3.78 and standard deviation=0.9). Table 4.1 shows that the factor disintermediation indicated the lowest mean value (m=3.75 and standard deviation=0.96), reflecting that the Internet is deemed relatively important in assuming the role of record labels in managing musicians.

Table 4.2: Descriptive Statistics on Supply and Demand

	Free online music	Music downloads	Indep. music	Complementary technologies	Digital music consumption	Devices	Bandwidth speeds	Regulation	Copyright laws
N	217	217	217	217	217	217	217	217	217
Mean	4.09	4.08	4.06	4.04	4.02	3.97	3.8	3.68	3.32
Median	4	4	4	4	4	4	4	4	4
Mode	4	4	5	4	4	4	4	4	4
Std. Deviation	0.906	0.922	0.95	0.722	0.855	0.852	0.878	0.95	1.304

The highest mean value (m=4.09 and standard deviation=0.91) indicates that free online music leads to further music consumption. Aligned with technological value, the second highest mean value (m=4.08 and standard deviation=0.92) similarly shows that the majority of respondents felt that music downloads are influenced by modular technological developments, such as smartphones. Musicians' tendency to resort to independent music production and creation is reflected with a mean value (m=4.06 and standard deviation=0.95) with the respondents confirming that technological advancements encourage independent music production. The mean value of 4.04 and standard deviation=0.72 show that the respondents agreed that complementary technology adoption influences customers to listen to more online music.

In keeping with bandwidth speed and compatible devices, the methods of distributing music have transformed the consumption of music (m=4.02 and standard deviation=0.86). Complimenting bandwidth speed, access to compatible devices (m=3.97 and standard deviation=0.85) is significantly noted to encourage online downloads. Access to high bandwidth speed elicited a mean value of 3.8 and standard deviation=0.88, indicating that the respondents agreed that access to high bandwidth speed influences online downloads.

The descriptive statistics (table 4.2) reflects that majority of respondents indicated concern surrounding the regulation of music distribution services with the second lowest mean value (m=3.68 and standard deviation=0.95). A similar cause for concern is related to the current copyright laws. Copyright laws provides adequate protection for musicians (lowest mean value of 3.32 and standard deviation=1.30). The result indicates that although respondents were in agreement that it does provide protection; that the marginal result is a cause for concern among the respondents' protection rights. Based on the discussion and findings, it can be interpreted that the variables are related to one another and influences and is influenced by each other.

Table 4.3: Descriptive Statistics on Supply Chain Competence and Capability

	Lean distribution	Value adding innovations	Response time	Technological advancements	Clockspeed	Service Delivery
N	217	217	217	217	217	217
Mean	4.11	4.09	4.2	4	3.95	3.86
Median	4	4	4	4	4	4
Mode	5	5	4	4	4	4
Std. Deviation	0.975	0.958	0.791	0.853	0.806	0.967

The highest noted mean value was for the statement that the Internet as a distributor offers lean distribution of updated or new music offerings to consumers (m=4.11 and standard deviation=0.98). Value adding innovations (such as iPods) or services (iTunes) add value to music (m=4.09 and standard deviation=0.96). Further to this, re-mixing music tracks can be achieved in a shorter time than during the traditional CD era (m=4.2 and standard deviation=0.79). In addition to supply chain competence and capability, technological advancements have facilitated the evolution of digital music (m=4 and standard deviation=0.85). The supply chain's competence and capability in terms of service delivery is displayed with the lowest mean value of 3.86 and standard deviation=0.97, indicating that the respondents agreed that the Internet is reliable in the delivery of both music products and services. Table 4.3 indicates that majority of respondents found that clockspeed music delivery

exists in the supply chain, where a mean value of 3.95 and standard deviation=0.79 illustrate that the respondents agreed that the digitalisation of music enables quick/swift response to changing demands.

4.3 Bivariate Data Analysis

4.3.1 Inferential Statistics

The basis of all statistical analysis in this study is a 95% confidence interval. In this case, the sampling distribution of the mean is normally shaped and is a reflection of the respondent mean.

4.3.2 Cross tabulation

Cross-tabulation is performed to establish a relationship between two variables, and if so, the information can be represented in a two-dimensional frequency distribution by cross-tabulating the variables. Therefore, cross-tabulation was used to test the association between the selected variables.

According to Wegner (2007:248), the Chi-Square test is a non-parametric test of significance that is useful when testing nominal data; is used to perform hypothesis tests about the variance; and can be used for single or group categories to test for significance between the observed distribution and expected distribution based on the null hypothesis. As a general rule for the Chi-Square test, the decision rule is to retain the null hypothesis if $p > 0.05$, and accept the alternate hypothesis if $p < 0.05$. Chi-square dictates the question of whether there is an association between the two nominal variables or whether they are independent of each other. In this cross-tabulation, chi-square supports the results obtained from cross-tabulation and affirms the decision to retain the alternative hypothesis as $p < 0.05$, indicating that there is an association between SAmp3.com and digital music innovation.

Table 4.4 cross-tabulates the variables to establish if an association exists between the two variables. It examines whether or not an association exists between SAmp3.com and digital music innovation.

Table 4.4: SAmp3.Com and Digital Music Innovation

Does SAmp3.com relate to digital music distribution inspires innovation to the musician?					
			Digital music distribution inspires innovation to the musician.		Total
			Yes	No	
SAmp3.com	Yes	Count	26	10	36
		SAmp3.com	72.20%	27.80%	100.00%
		Total	12.00%	4.60%	16.60%
	No	Count	164	17	181
		SAmp3.com	90.60%	9.40%	100.00%
		Total	75.60%	7.80%	83.40%
Total		Count	190	27	217
		SAmp3.com	87.60%	12.40%	100.00%
		Digital music distribution inspires innovation to the musician.	100.00%	100.00%	100.00%
		Total	87.60%	12.40%	100.00%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	9.317[a]	1	0.002		
Continuity Correction[b]	7.706	1	0.006		
Likelihood Ratio	7.72	1	0.005		
Fisher's Exact Test				0.005	0.005
Linear-by-Linear Association	9.274	1	0.002		
N of Valid Cases	217				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.48.

b. Computed only for a 2x2 table

H_{o1}: The association between SAmp3.com and digital music distribution does not inspire innovation to the musician.

H_{A1}: The association between SAmp3.com and digital music distribution does inspire innovation to the musician.

Table 4.4 illustrates that 87.6% of respondents agreed that digital music distribution inspires innovation in the musician. The degree of freedom (1) and level of significance is determined based on the minimum expected count. The *p* value (0.002) is less than the level of significance (0.005). The Chi-square test (9.317) is more than the expected count (2.10). The decision to reject the null hypothesis and accept the alternate hypothesis is based on the strength of the association between SAmp3.com and digital music distribution inspires innovation in the

musician. This infers that those respondents who distribute their music through SAmp3.com believe that digital music innovation inspires innovative performance by the musician.

Table 4.5: Music Distributed by and Medium of Distribution

Does the means of distribution associated with the medium of distribution?						
			Medium of Distribution			
			Electronic distribution	Traditional means	Both	Total
Music is Distributed by	Myself	Count	83	24	44	151
		Music is Distributed by	55.0%	15.9%	29.1%	100.0%
		Total	38.2%	11.1%	20.3%	69.6%
	My Label	Count	22	14	30	66
		Music is Distributed by	33.3%	21.2%	45.5%	100.0%
		Total	10.1%	6.5%	13.8%	30.4%
Total		Count	105	38	74	217
		Music is Distributed by	48.4%	17.5%	34.1%	100.0%
		Total	48.4%	17.5%	34.1%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.769[a]	2	.012
Likelihood Ratio	8.887	2	.012
Linear-by-Linear Association	8.184	1	.004
N of Valid Cases	217		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.56.

H_{o2}: There is no association between the means and the medium of distribution in the music industry.

H_{A2}: There is association between the means and the medium of distribution in the music industry.

A large portion of the sample (48.4%) stated that they distributed their music electronically; whilst 34.1% distributed their music through both traditional means (physical music retailers) and electronic means. The data in Table 4.5 also indicates that 17.5% of the respondents distribute their music only through traditional means. The respondents that stated that they distributed their music themselves (69.9%) indicated that they used electronically means (38.2%); traditional means (11.1%); and both traditional and digital means (20.3%). Of those that distributed their music via their record labels, 10.1% did so electronically; 6.5% through traditional means and 13.8% through music stores and online. The degree of freedom (2) and

level of significance is determined based on the minimum expected count. The *p* value (0.012) is less than the level of significance (0.005). The Pearson Chi-square test (8.769) is more than the expected count (2.10). The decision to reject the null hypothesis and accept the alternate hypothesis based on the strength of association between the means of distribution and the method of distribution. The level of indifference and proportion suggests a fragmented music industry with a potential growth prospects.

4.3.3 Pearson Correlation

In order to achieve the study's objectives, it was important to establish the correlation between and among the variables. Pearson's correlation co-efficient can be used to define the relationship between two or more variables. According to Cooper and Schindler (2008); and Urdan (2005) it is conventional that if $p < 0.05$, the correlation is considered to be significant. According to Urdan (2005:20-29), correlation coefficients possess two fundamental characteristics; firstly the direction of the relationship between two variables may be positive or negative; and secondly the strength of the variables may range from -1.00 to +1.00. The level of significance determines the statistical significance or insignificance of the variables. The closer the correlation coefficient is to either -1.00 or +1.00, the stronger the relationship.

4.3.4 Pearson's Correlation Coefficients Analysis

Pearson's correlation also measures the relationship between two or more variables. However, this only indicates the strength and direction of the relationship between two variables. Pearson's correlation measures the magnitude and direction of the linear association by identifying Pearson's coefficient. According to Cooper and Schindler (2008), a variable with a correlation value of greater than 0.7 is considered to have a strong positive relationship; variables with correlation value of between 0.4 and 0.6 are considered to have moderate relationships; and variables with correlation values between 0.3 and 0.1 are considered to have a weak relationship.

The table below shows the results of questions from the ranking aspects to show the correlation between variables in multiple regression. It is established that if the *p* value is less than 0.05, the correlation is considered to be significant (Cooper and Schindler, 2008). This study used the *p* value for discussion and interpretation of the correlation between variables.

Table 4.6: Pearson Correlation: Music Distribution

		ID	Disint	Consump	Retail	Entrep	DoD
Internet distribution (ID)	Pearson Correlation	1	.193**	.565**	0.085	.288**	0.06
	Sig. (2-tailed)		0.004	0	0.21	0	0.377
	N	217	217	217	217	217	217
Disintermediation (Disint.)	Pearson Correlation	.193**	1	.193**	.273**	.190**	.194**
	Sig. (2-tailed)	0.004		0.004	0	0.005	0.004
	N	217	217	217	217	217	217
Mass consumption (Consump)	Pearson Correlation	.565**	.193**	1	.151*	.341**	.155*
	Sig. (2-tailed)	0	0.004		0.027	0	0.022
	N	217	217	217	217	217	217
Retail music stores (Retail)	Pearson Correlation	0.085	.273**	.151*	1	.235**	.171*
	Sig. (2-tailed)	0.21	0	0.027		0	0.012
	N	217	217	217	217	217	217
Music entrepreneurs (Entrep)	Pearson Correlation	.288**	.190**	.341**	.235**	1	.184**
	Sig. (2-tailed)	0	0.005	0	0		0.007
	N	217	217	217	217	217	217
Distinction of distribution (DoD)	Pearson Correlation	0.06	.194**	.155*	.171*	.184**	1
	Sig. (2-tailed)	0.377	0.004	0.022	0.012	0.007	
	N	217	217	217	217	217	217
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed) p							

The advancement in methods that distribute music through the Internet has no bearing on the reduction in the number of physical music retail stores in the region. There is a statistically significant positive correlation between the Internet advancing methods of distributing music and the Internet has resulted in the disintermediation of record labels (r=.193 and p=0.004). This can be interpreted as agreement with one statement is correlated with agreement with the other statement. In general, those respondents who agreed with one also agreed with the other. In the same way, there is a strong positive correlation between the Internet's distribution of music and the mass consumption of music online (r=.565 and p=0); and the creation and promotion of music entrepreneurs (r=.288 and p=0). This study sought to understand the impact of the Internet as a music distributor. The data gathered and the correlation between variables shows that the perceptions of South African respondents are in keeping with global views and confirm the positive association between the Internet's distribution of music, mass consumption and the creation of music entrepreneurs. In line with the literature on the Internet as disintermediation, strong positive correlation exists between the disintermediation of record labels and the mass consumption of music online (r=.193 and p=0.004); the closure of physical retail stores' (r=.273

and p=0); the creation and promotion of music entrepreneurs (r=.190 and p=0.005); and acknowledging the distinction in distribution (r=.194 and p=0.004). Alves (2004) attests to these occurrences.

In line with the foregoing discussion on opinions of music distribution, there is a strong relationship between the mass consumption of music online and a reduction in the number of physical retail stores (r=.151 and p=0.027); the creation and promotion of music entrepreneurs (r=.341 and p=0); and acknowledging the distinction in distribution (r=.155 and p=0.022). There is likewise a strong positive correlation between a reduction in the number of physical retail stores and the creation and promotion of music entrepreneurs (r=.235 and p=0); and acknowledging the distinction in distribution (r=.171 and p=0.012). Finally, there is a strong positive correlation between the creation and promotion of music entrepreneurs and respondents acknowledging the distinction in distribution (r=.184 and p=0.007). It can thus be inferred that the Internet has resulted in the mass consumption of online music which led to the disintermediation of record labels. As a result, numerous musicians emerge as music entrepreneurs and control the distribution and marketing of their own music. This concurs with the findings in the literature. The findings also point to an insignificant association between Internet distribution and the Internet being responsible for the closure of retail music stores. The literature notes that the introduction of vinyls and Record Store Day is viewed as the revival of physical retail stores.

Table 4.7: Pearson Correlation: Technological value-adding innovations – Supply and Demand

		Dmc	Fom	CL	CT	M dl	Regulation	Band	Devices	Indep. music
Digital music consumption (Dmc)	Pearson Correlation	1	.273**	.177**	.179**	.210**	0.116	.270**	.261**	.238**
	Sig. (2-tailed)		0	0.009	0.008	0.002	0.09	0	0	0
	N	217	217	217	217	217	217	217	217	217
Free online music (Fom)	Pearson Correlation	.273**	1	0.117	0.108	.280**	-0.005	.249**	.256**	.230**
	Sig. (2-tailed)	0		0.084	0.114	0	0.94	0	0	0.001
	N	217	217	217	217	217	217	217	217	217
Copyright laws (CL)	Pearson Correlation	.177**	0.117	1	.133*	0.122	.299**	.148*	0.022	-0.002
	Sig. (2-tailed)	0.009	0.084		0.05	0.074	0	0.029	0.75	0.98
	N	217	217	217	217	217	217	217	217	217
Complementary technologies (CT)	Pearson Correlation	.179**	0.108	.133*	1	.308**	.215**	.203**	.220**	.171*
	Sig. (2-tailed)	0.008	0.114	0.05		0	0.001	0.003	0.001	0.011
	N	217	217	217	217	217	217	217	217	217
Music downloads (M dl)	Pearson Correlation	.210**	.280**	0.122	.308**	1	0.108	.305**	.316**	.316**
	Sig. (2-tailed)	0.002	0	0.074	0		0.113	0	0	0
	N	217	217	217	217	217	217	217	217	217
Regulation	Pearson Correlation	0.116	-0.01	.299**	.215**	0.108	1	.157*	.187**	0.048
	Sig. (2-tailed)	0.09	0.94	0	0.001	0.113		0.021	0.006	0.478
	N	217	217	217	217	217	217	217	217	217
Bandwidth speed (Band)	Pearson Correlation	.270**	.249**	.148*	.203**	.305**	.157*	1	.295**	.243**
	Sig. (2-tailed)	0	0	0.029	0.003	0	0.021		0	0
	N	217	217	217	217	217	217	217	217	217
Compatible devices (Devices)	Pearson Correlation	.261**	.256**	0.022	.220**	.316**	.187**	.295**	1	.340**
	Sig. (2-tailed)	0	0	0.75	0.001	0	0.006	0		0
	N	217	217	217	217	217	217	217	217	217
Independent music (Indep. music)	Pearson Correlation	.238**	.230**	-0.002	.171*	.316**	0.048	.243**	.340**	1
	Sig. (2-tailed)	0	0.001	0.98	0.011	0	0.478	0	0	
	N	217	217	217	217	217	217	217	217	217
**. Correlation is significant at the 0.01 level (2-tailed).										
*. Correlation is significant at the 0.05 level (2-tailed).										

The data presented in Table 4.7 illustrates that there is a strong positive correlation between digital music consumption and free online music (r=.273 and p=0); copyright laws (r=.177 and p=0.009); complementary technologies (r=.179 and p=0.008); music downloads (r=.210 and p=0.002); bandwidth speed (r=.270 and p=0); compatible devices (r=.261 and p=0) and the creation of independent music (r=.238 and p=0); however the p value at 0 indicates a very weak relationship between the two variables. On these grounds, as noted by Winston and Choi (1997), the properties of digital goods encourage digital technology production and innovation enhancements to suit the consumer in adapting to the digital environment. No relationship was found between digital music consumption and the regulation and closure of digital distribution services to reduce the illegal downloading of music (r=.116 and p=0.09). This suggests that, regardless of copyright laws, consumers will continue to download music from the Internet; hence demand will continue.

A strong correlation was found between the constant variable: free online music leading and further music consumption and music downloads (r=.280 and p=0); bandwidth speed (r=.249 and p=0); compatible devices (r=.256 and p=0); and independent music (r=.230 and p=0.001). This is confirmed by the literature. However, there is no significant relationship between free online music leading to further downloads and copyright laws (r=.117 and p=0.084) and complementary technologies (r=.108 and p=0.114); and an extremely negative relationship with the regulation and closure of illegal downloading services (r=-0.005 and p=0.94). This suggests that the respondents do not have faith in the current copyright laws and regulation within the recording industry and that despite the availability of complementary technologies, consumers will continue to download music with the resources that are available to them.

There were two significant positive correlations: between the constant variable current copyright laws; and the regulation and closure of illegal downloading services (r=.299 and p=0); and access to high bandwidth speed (r=.148 and p=0.029). Neither positive nor negative correlation was found between the current copyright laws and complementary technologies (r=.133 and p=0.05), although the relationship is significant at the 2-tailed level. Three negative correlations were reported: between the current copyright laws and music downloads (r=0.122 and p=0.074); compatible devices (r=0.022 and p=0.75); and the creation of independent music (r=-0.002 and p=0.98). The interpretation of this finding can be applied to the related discussion above.

Table 4.7 further indicates that there are statistically strong positive correlations between complementary technologies influencing customers to listen to more online music and music downloads (r=.308 and p=0); regulation and closure of illegal downloading services (r=.215 and p=0.001); access to high bandwidth speed (r=.203 and p=0.003); compatible devices (r=.220 and p=0.001); and the creation and promotion of independent music (r=.171 and p=0.011). These results confirm the work of Hracs (2012).

A negative correlation is reported between the constant variable music downloads being influenced by modular technological developments; and the regulation and closure of illegal downloading services (r=.108 and p=0.113); however there are positive correlations between music downloads being influenced by modular technological developments and access to high bandwidth speed (r=.305 and p=0); compatible devices (r=.316 and p=0); and the creation and promotion of independent music (r=.316 and p=0). The latter are identified in the literature as factors that encourage and harness music consumption.

There is strong positive correlation between the regulation and closure of illegal downloading services and access to high bandwidth speed (r=.157 and p=0.021); and compatible devices (r=.187 and p=0.006); however no significant relationship is reported between the regulation and closure of illegal downloading services and the creation and promotion of independent music (r=0.048 and p=0.478). Similarly there is a positive correlation between the constant variable access to high bandwidth speed; and compatible devices (r=.295 and p=0) and the creation and promotion of independent music (r=.243 and p=0). Finally, a positive, significant relationship is reported between access to technologically compatible devices and the creation and promotion of independent music (r=.340 and p=0). Given the centrality of these variables in music consumption and demand, this aligns with discussions in the literature. The variables digital music consumption, free online music, complementary technologies, music downloads, bandwidth speed, compatible devices and independent music production collectively create competitiveness in the supply chain. The two variables of concern are copyright laws and regulation of services. These are linked to the protection of musicians against illegal downloads which can be rectified by means of Digital Rights Management and Intellectual Property Rights. Once this is achieved and aligned with the other variables, a purely competitive supply chain strategy can be designed to protect musicians.

Table 4.8: Pearson Correlation: Supply Chain Competence and Capability

		Vai	Response time	Clock	Service delivery	TA	Lean
Value adding innovations (Vai)	Pearson Correlation	1	.165*	.204**	.254**	.159*	-0.016
	Sig. (2-tailed)		0.015	0.003	0	0.019	0.816
	N	217	217	217	217	217	217
Response time (Response)	Pearson Correlation	.165*	1	.336**	.261**	.304**	.211**
	Sig. (2-tailed)	0.015		0	0	0	0.002
	N	217	217	217	217	217	217
Clockspeed (clock)	Pearson Correlation	.204**	.336**	1	.276**	.316**	.201**
	Sig. (2-tailed)	0.003	0		0	0	0.003
	N	217	217	217	217	217	217
Service delivery	Pearson Correlation	.254**	.261**	.276**	1	.291**	.267**
	Sig. (2-tailed)	0	0	0		0	0
	N	217	217	217	217	217	217
Technological advancements (TA)	Pearson Correlation	.159*	.304**	.316**	.291**	1	.240**
	Sig. (2-tailed)	0.019	0	0	0		0
	N	217	217	217	217	217	217
Lean distribution (Lean)	Pearson Correlation	-0.016	.211**	.201**	.267**	.240**	1
	Sig. (2-tailed)	0.816	0.002	0.003	0	0	
	N	217	217	217	217	217	217
*. Correlation is significant at the 0.05 level (2-tailed).							
**. Correlation is significant at the 0.01 level (2-tailed).							

The data presented in Table 4.8 indicates that there is a strong positive correlation between the constant variable value adding innovations and response time (r=.165 and p=0.015); clockspeed (r=.204 and p=0.003); the Internet as a reliable means for the delivery of music products and services (r=.254 and p=0); and technological advancements (r=.159 and p=0.019). These variables illustrate a key idea behind digital distribution. Response time, clockspeed delivery, service delivery and technological advancements not only complement each other, but one another (supported by the data in Table 4.8) and combine to create a competent and capable supply chain. This in turn creates supply chain competitiveness. Despite these positive findings, there is a statistically significant strong negative correlation between innovations adding value to music and the Internet as a medium of lean distribution (r=-0.016 and p=0.816). This suggests that although there are products which add value to music, the Internet may not be the only distributor of new music offerings.

This study used a correlation matrix to predict the relationship between all possible pairs of variables using significance level of $p = 0.05$. The significance level shows how possible it is that the correlations reported may be due to chance in the random sampling error. A correlation matrix provides details of acceptable positive correlation values between each pair of variables with significance of less than 0.005.

4.4 Multivariate Data Analysis

"In order to determine the extent to which the independent variable or variables affects the dependent variable, multiple regression analysis is used" (Downing and Clark, 2003:67). The study analysed the influence of the dependent variable (digital distribution value) and the independent variables (music distribution, supply and demand, and supply chain competence and capability). Correlation and multiple regression analyses were conducted to examine the relationship between the dependent variable and independent variables (Cooper and Schindler, 2010:546).

4.4.1 Multiple Regression

Multiple regression analysis was used to examine the influence of the independent variables (music distribution, supply and demand, and supply chain competence and capability) on the dependent variable. A regression analysis is done for one of two reasons: to predict the value of the dependent variable for individuals for whom some information concerning the explanatory variables is available, or to estimate the effect of some explanatory variable on the dependent variable. Multiple regressions are a weighting equation used to generate the relationship between the two types of variables in order to distinguish models in the elements (Cooper and Schindler, 2008:546). Hence, the basic purpose of regression models is to establish how well variables explain the variation of the dependent variable.

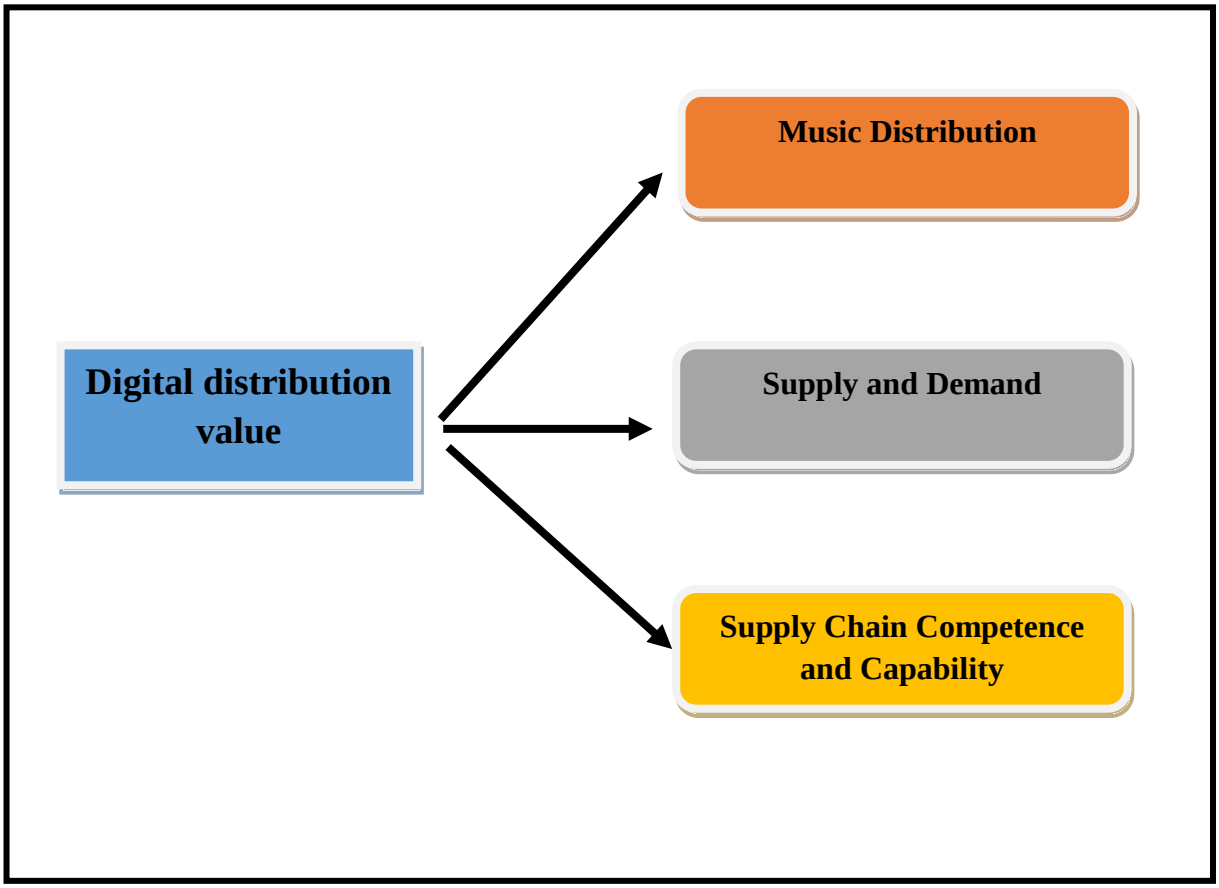
Table 4.9: Correlation Between Variables

		Digital consumption	**Clockspeed delivery**
The digital distribution of music has added value in the growth of the South African recording industry.	Pearson Correlation	.239**	.162*
	Sig. (2-tailed)	0	0.017
	N	217	217
**. Correlation is significant at the 0.01 level (2-tailed).			
*. Correlation is significant at the 0.05 level (2-tailed) p			

Correlation is used in this section to examine the relationship between the dependent variable "The digital distribution of music has added value in the growth of the South African recording industry" and the digital consumption and clockspeed delivery of music. There is a statistically significant positive relationship between digital music distribution and music consumption as $p < 0.05$.

Figure 4.15 shows the relationship between digital distribution value (dependent variable) and the three independent variables.

Figure 4.15: Dependent Variable and Independent Variables



Source: Developed by researcher from hypotheses.

The following three statements were created to test the strength of the relationship between the variables:

Model 1: Digital Distribution Value and Music Distribution

There is a relationship between digital distribution value and music distribution.

Model 2: Digital Distribution Value and Supply and Demand

There is a relationship between digital distribution value and supply and demand.

Model 3: Digital Distribution Value and Supply Chain Competence and Capability

There is a relationship between digital distribution value and supply chain competence and capability.

The table below shows the results of questions from the ranking aspects to illustrate the correlation between variables in multiple regression.

Table 4.10: Correlations for Multiple Regression on 3 Models

A: Model 1

Model 1	ID	Disint	Consump	Retail	Entrep	DoD
Internet distribution (ID)	1	.193**	.565**	0.085	.288**	0.06
Disintermediation (Disint.)	.193**	1	.193**	.273**	.190**	.194**
Mass consumption (Consump)	.565**	.193**	1	.151*	.341**	.155*
Retail music stores (Retail)	0.085	.273**	.151*	1	.235**	.171*
Music entrepreneurs (Entrep)	.288**	.190**	.341**	.235**	1	.184**
Distinction of distribution (DoD)	0.06	.194**	.155*	.171*	.184**	1

B: Model 2

Model 2	Dmc	Fom	CL	CT	M dl	Regulation	Band	Devices	Indep. music
Digital music consumption (Dmc)	1	.273**	.177**	.179**	.210**	0.116	.270**	.261**	.238**
Free online music (Fom)	.273**	1	0.117	0.108	.280**	-0.005	.249**	.256**	.230**
Copyright laws (CL)	.177**	0.117	1	.133*	0.122	.299**	.148*	0.022	-0.002
Complementary technologies (CT)	.179**	0.108	.133*	1	.308**	.215**	.203**	.220**	.171*
Music downloads (M dl)	.210**	.280**	0.122	.308**	1	0.108	.305**	.316**	.316**
Regulation	0.116	-0.005	.299**	.215**	0.108	1	.157*	.187**	0.048
Bandwidth speed (Band)	.270**	.249**	.148*	.203**	.305**	.157*	1	.295**	.243**
Compatible devices (Devices)	.261**	.256**	0.022	.220**	.316**	.187**	.295**	1	.340**
Independent music (Indep. music)	.238**	.230**	-0.002	.171*	.316**	0.048	.243**	.340**	1

C: Model 3						
Model 3	Vai	Response time	Clock	Service delivery	TA	Lean
Value adding innovations (Vai)	1	.165*	.204**	.254**	.159*	-0.016
Response time (Response)	.165*	1	.336**	.261**	.304**	.211**
Clockspeed (clock)	.204**	.336**	1	.276**	.316**	.201**
Service delivery	.254**	.261**	.276**	1	.291**	.267**
Technological advancements (TA)	.159*	.304**	.316**	.291**	1	.240**
Lean distribution (Lean)	-0.016	.211**	.201**	.267**	.240**	1

The correlations between variables are viewed as normal correlation relationships. All statistics tend to range positively for Pearson product movement correlation. The level values follow suit with moderate relationships with the dependent variable (digital distribution value). The normality of relationships relies on the strength of significance values to control the independent variables. In most cases, there appears to be a weak to moderately positive relationship among the variables. Weak relationships are classified as having a correlation value between 0.3 and 0.1, whereas moderate relationships have a correlation value that lies between 0.4 and 0.6 (Cooper and Schindler, 2008). Variables that display a strong positive relationship possess correlation values greater than 0.7 (Cooper and Schindler, 2008). From the correlation table, it is evident that some variables have a moderately positive effect on each other.

Once the strength and direction of the relationships between the variables was established, the next step was to determine those variables that have a predictive influence over the dependant variable. From the analysis of the variables, three model predictors (independent variables) were generated, using SPSS statistics package, which influence the dependant variable.

The three models can be further analysed in terms of variation and model fit. An important point to bear in mind regarding regression models is how well they explain the variation in the dependent variable. The model summary in table 4.11 informs the researcher how much of the variance in the independent variable is explained by the model. The coefficient of determination R square or (R^2) measures the degree of linear explanation provided by the model.

Table 4.11: Statistics on Model Summary. ANOVA, Coefficients and Residuals

Model Summary[b,c]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.466[a]	0.218	0.195	0.789	1.943
2	.392[a]	0.154	0.117	0.826	1.898
3	.430[a]	0.185	0.161	0.805	2.037
a. Predictors: (Constant)					
b. outlier = 1.00					
c. Dependent Variable: Digital distribution value					

ANOVA[b,c]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36.153	6	6.025	9.682	.000[a]
	Residual	130.065	209	0.622		
	Total	166.218	215			
2	Regression	25.568	9	2.841	4.161	.000[a]
	Residual	140.65	206	0.683		
	Total	166.218	215			
3	Regression	30.705	6	5.118	7.893	.000[a]
	Residual	135.512	209	0.648		
	Total	166.218	215			
a. Predictors: (Constant)						
b. outlier = 1.00						
c. Dependent Variable: Digital distribution value						

Coefficients[a,b]						
Model 1	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.636	0.416		3.937	0		
Internet distribution	0.309	0.08	0.286	3.874	0	0.686	1.458
Disintermediation	0.254	0.06	0.277	4.227	0	0.87	1.15
Mass consumption	-0.159	0.077	-0.157	-2.07	0.04	0.652	1.534
Retail music stores	0.182	0.065	0.184	2.825	0.005	0.881	1.135
Music entrepreneurs	-0.022	0.068	-0.022	-0.323	0.747	0.803	1.245
Distinction of distribution	0.045	0.062	0.046	0.722	0.471	0.922	1.084
a. outlier = 1.00							
b. Dependent Variable: Digital distribution value							

The model summary table depicts an increase in R^2 from 0.154 to 0.218 from model 2 to model 3 and then to model 1, which explains the variation in digital distribution value as more predictor variables are added to each model. For any model, as the number of explanatory

(independent) variables increases, there is a subsequent increase in R^2. Hence, a difference in comparison exists when regression models have the same dependant variable but a different number of explanatory variables. The value of R^2 in a multiple regression model can be misleading, as it only captures how well the model fits the data, but not how many variables the model contains. Thus instead of using R^2, adjusted R^2 is used, which takes into account the number of variables used and how well the model fits the sample data. Hence model 1 to model 3 shows an increase in their adjusted R^2 values ranging from 0.154 to 0.195 between models 1 and 3. An improvement is noted in the adjusted R^2 values where the first model has a higher value of adjusted R^2; therefore, it has a better degree of explanatory power (after controlling for the number of variables). Hence, model 1 is able to explain more of the variation in digital distribution value than the rest of the models.

R is the correlation of the independent variables with the dependent variable after inter-correlations among the independent variables have been taken into account. The R^2 value is defined as the explained variance. The table indicates that the F value is significant at the 0.001 level. Under the column df the first value represents the number of independent variables and the second value is the total number of responses for all the variables in the equation (N), minus the number of independent variables (K) minus 1 (Sekaran and Bougie, 2003:40-99). This means N-K-1=x. The R column represents the value of R for the three models, the multiple correlation coefficient. The values of 0.47; 0.39 and 0.43 indicate a good level of predication.

In Model 1, $R^2 = 0.218$. Therefore, the model is able to explain 22% of the variation in digital music distribution.

In Model 2, $R^2 = 0.154$. Therefore, the model is able to explain 15% of the variation in digital music distribution.

In Model 3, $R^2 = 0.185$. Therefore, the model is able to explain 19% of the variation in digital music distribution.

The "R-square" column represents the R^2 value (frequently known as the coefficient of determination) which is the proportion of the variance in the dependent variable that can be explained by the independent variables.
Model 1 – Adjusted $R^2 = 0.195$
Model 2 – Adjusted $R^2 = 0.117$
Model 3 – Adjusted $R^2 = 0.161$

Model 1 has the highest value of adjusted R^2; therefore it has a better degree of explanatory power (after controlling for the number of variables). Hence model 1 is able to explain more of the variation in information sharing than Models 2 and 3.

The Durbin-Watson test, tests that residuals in a multiple regression are independent. The purpose of the Durbin-Watson test is to validate the absence of autocorrelation in time series data. In testing for autocorrelation within the value of Durbin-Watson (0 to 4), the values close to 0 indicate extreme positive autocorrelation (standard errors of the B coefficients are too small); close to 4 indicate extreme negative autocorrelation (standard errors are too large); and close to 2 indicate no serial autocorrelation. The statistics test the presence of extreme positive autocorrelation among the value of Durbin-Watson which ranges from 1.5 to 2.5 for Model 1 (1.943); Model 2 (1.898); and Model 3 (2.037). The purpose of the test is to validate the absence of autocorrelation in time series data. The assumptions consider that error terms (ε_i) in the regression possess a zero mean and constant variance and are uncorrelated (Montgomery and Vinning, 2001). Thus:

$$[E(\varepsilon_i) = 0; \text{Var}(\varepsilon_i) = 2 \text{ and } E(\varepsilon_i\varepsilon_j) = 0]$$

In this study, Durbin Watson is 1.943 which is within the stipulated range; this also confirms non-autocorrelation between the residuals in this regression. To assess the statistical significance of the result, the researcher needs to consult the ANOVA table. ANOVA tests that the multiple R in the population equals 0. Results from the ANOVA table indicate that these predictors account for 21.8% of the Model 1 variance (R^2=.218, adjusted R^2=0.195, F=9.682, p<.0005); Model 2 variance (R^2=.154, adjusted R^2=0.117, F=4.161, p<.0005); and Model 3 variance (R^2=.185, adjusted R^2=0.161, F=7.893, p<.0005). The decrease then increase in variation R^2 from Model 1 to Model 3 is evident in digital music distribution as more predictor variables are added to each model. For any model, as the number of explanatory (independent) variables increases, there is a subsequent increase in R^2. Hence a difference in comparison exists when regression models have the same dependent variable but a different number of explanatory variables. The value of R^2 in a multiple regression model can be misleading as it only captures how well the model fits the data, and not how many variables the model contains. All t-tests (found in Appendix D) for the coefficients are significant at p<0.005.

In this study, all three models have a significance value of 0 at the 95% confidence level; thus it is deduced that model 1 to model 3 reach statistical significance. Thus the researcher can accept

the alternate hypothesis and conclude there is a relationship between the variables of model 1, model 2 and model 3.

Test for Multicollinearity:

When analysing regressions it is critical for the researcher to conduct a test for multicollinearity. "If two or more independent variables are highly correlated, severe multicollinearity is present" (Chase Jr, 2013:67). According to Brooks (2008:172), "should multicollinearity be present, R square will be high but the individual coefficients will have high standard errors so that the regression seems acceptable but the individual variables are insignificant. As a result significance tests may provide inappropriate conclusions which make it difficult to draw inferences."

Table 4.12: Collinearity

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.636	0.416		3.937	0		
	Internet distribution	0.309	0.08	0.286	3.874	0	0.686	1.458
	Disintermediation	0.254	0.06	0.277	4.227	0	0.87	1.15
	Mass consumption	-0.159	0.077	-0.157	-2.07	0.04	0.652	1.534
	Retail music stores	0.182	0.065	0.184	2.825	0.005	0.881	1.135
	Music entrepreneurs	-0.022	0.068	-0.022	-0.32	0.747	0.803	1.245
	Distinction of distribution	0.045	0.062	0.046	0.722	0.471	0.922	1.084
2	(Constant)	1.808	0.476		3.798	0		
	Digital music consumption	0.197	0.072	0.191	2.714	0.007	0.828	1.208
	Free online music	0.106	0.068	0.11	1.556	0.121	0.828	1.208
	Copyright Laws	0.098	0.047	0.146	2.107	0.036	0.856	1.168
	Complementary technologies	0.078	0.085	0.064	0.926	0.355	0.853	1.173
	Music downloads	0.069	0.07	0.073	0.987	0.325	0.755	1.324
	Regulation	0.101	0.065	0.109	1.564	0.119	0.847	1.181
	Bandwidth speed	-0.14	0.072	-0.139	-1.95	0.052	0.807	1.238
	Compatible devices	-0.019	0.076	-0.019	-0.25	0.801	0.759	1.318
	Independent music	0.083	0.067	0.09	1.249	0.213	0.79	1.266
3	(Constant)	1.506	0.429		3.512	0.001		
	Value adding innovations	0.259	0.063	0.276	4.131	0	0.874	1.145
	Response time	0.096	0.077	0.086	1.248	0.214	0.818	1.223
	Clockspeed	0.037	0.076	0.034	0.488	0.626	0.8	1.249
	Service delivery	0.145	0.064	0.159	2.279	0.024	0.796	1.256
	Technological advancements	-0.01	0.072	-0.009	-0.14	0.893	0.811	1.233
	Lean distribution	0.102	0.06	0.113	1.692	0.092	0.872	1.146
a. Dependent Variable: Digital Music Distribution								

Multicollinearity is one of the important problems in multiple regression analysis. It is usually regarded as a problem arising from the violation of the assumption that the explanatory variation is linearly independent. However, the mere satisfaction of this assumption does not preclude the possibility of an approximate linear dependence among the explanatory variables; hence the problem of multicollinearity. When identifying if multicollinearity exists in the model, the researcher needs to look at the tolerance and VIF values.

Judging from the three models shown with coefficients, the tolerance level (1.000) is much greater than 0.10 which depicts that the multiple correlations with variables are low; hence, the factor of multicollinearity is omitted. The VIF factor (1.000) depicts values below 10; hence, there is no concern of multicollinearity in the analysis. Using the three models, the results generated positive coefficients for independent variables in conjunction with digital distribution value.

Since all three models have a significance value of 0 at the 95% confidence level, the indication is that all three reach statistical significance. It is evident from Table 4.12 that all three models have predictors with tolerance values greater than 1. Hence the multicollinearity assumption is not violated. This is further supported by the VIF values, which for all respective models is less than 10, indicating that multicollinearity does not exist with other variables. These results are expected, given that the Pearson correlation coefficient between these independent variables is relatively low. An assessment of the beta value is important when evaluating the independent variables.

The beta weight indicates the relative importance of a predicator in predicting the dependent variable. The larger the value of the beta weight, the more influence this factor has on predicting the dependant variable (digital music distribution). Technological value adding innovations in supply and demand has the highest beta value of 1.808 among the three models. Thus, technological value adding innovations monitoring supply and demand make the strongest unique contribution to explaining the dependent variable when all other variables in the model are controlled. The significance value *(p)* is 0.000 at the 95% level of confidence.

Digital Distribution Value
Y=A+BX1+ BX2+ BX3+ BX4+ BX5+ BX6 **Digital distribution value = 1.636+0.309Id + 0.254Disint. – 0.159Consump. + 0.182Retail – 0.022Entrep. – 0.045 Dod**

The above information thereby allowed the researcher to derive a linear equation that factors in all three variables in the model that impact on digital distribution value.

Table 4.13: Residual Statistics

Residuals Statistics[a,b]					
MODEL 1	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**	**N**
Predicted Value	2.7	4.98	4.06	0.41	216
Std. Predicted Value	-3.306	2.237	0	1	216
Standard Error of Predicted Value	0.061	0.275	0.137	0.038	216
Adjusted Predicted Value	2.92	4.98	4.06	0.407	216
Residual	-2.429	1.662	0	0.778	216
Std. Residual	-3.079	2.107	0	0.986	216
Stud. Residual	-3.158	2.133	0	1.005	216
Deleted Residual	-2.554	1.704	-0.001	0.808	216
Stud. Deleted Residual	-3.228	2.151	-0.002	1.009	216
Mahal. Distance	0.273	25.186	5.972	4.116	216
Cook's Distance	0	0.093	0.006	0.011	216
Centered Leverage Value	0.001	0.117	0.028	0.019	216
MODEL 2					
Predicted Value	3.23	4.8	4.06	0.345	216
Std. Predicted Value	-2.414	2.141	0	1	216
Standard Error of Predicted Value	0.067	0.293	0.172	0.045	216
Adjusted Predicted Value	3.13	4.79	4.06	0.345	216
Residual	-3.003	1.772	0	0.809	216
Std. Residual	-3.635	2.145	0	0.979	216
Stud. Residual	-3.72	2.201	0	1.005	216
Deleted Residual	-3.145	1.867	0	0.853	216
Stud. Deleted Residual	-3.842	2.222	-0.002	1.012	216
Mahal. Distance	0.423	25.957	8.958	5.109	216
Cook's Distance	0	0.104	0.005	0.011	216
Centered Leverage Value	0.002	0.121	0.042	0.024	216
MODEL 3					
Predicted Value	2.65	4.66	4.06	0.378	216
Std. Predicted Value	-3.728	1.6	0	1	216
Standard Error of Predicted Value	0.059	0.282	0.139	0.041	216
Adjusted Predicted Value	2.74	4.68	4.06	0.377	216
Residual	-2.923	1.891	0	0.794	216
Std. Residual	-3.631	2.349	0	0.986	216
Stud. Residual	-3.654	2.438	0	1.005	216
Deleted Residual	-2.96	2.038	-0.001	0.824	216
Stud. Deleted Residual	-3.767	2.468	-0.002	1.011	216
Mahal. Distance	0.169	25.447	5.972	4.34	216
Cook's Distance	0	0.095	0.006	0.011	216
MODEL 3	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**	**N**
Centered Leverage Value	0.001	0.118	0.028	0.02	216
a. outlier = 1.00					
b. Dependent Variable: Digital Music Distribution					

The purpose of residual analysis is to:

1) Identify heteroscadasticity;

2) Detect outliers; and

3) Spot stochastic errors that are associated with certain ranges of X variables.

Hence, the model response is largely dependent on the deterministic portion of the model and stochasticity (Frost, 2012). The studentised and standardised residuals are similar in measuring outliers and influential observations that exist in the data. The standardised residual in this study (min = -3.079 and max = 2.107) within expected interval (-3.3 or ±3) and studentised residual (min = -3.158 and max = 2.133). The model has a normal distribution mean of 0 (0.000) and standard deviation closer to 1 (0.986) from standardised.

The measure of Cook's Distance (D) is an indication of the level of influence an observation has on the overall model – if D > 1 this implies an outlier problem, that is, D > $4/N \rightarrow$ where N is sample size (Bryman and Bell, 2007). According to Karlaftis, Washington and Mannering (2011:101), "Cooks distance quantifies the impact of removal of each observation from the fitted regression function on estimated parameters in the regression function." This study illustrates Cook's Distance with (min = 0.000 and max = 0.093) and value of D less than 1, implying that the observations do not have large influences on the regression analysis.

The leverage of an observation is a measure of the ability to impact the regression model coefficients by shifting the value of the observation on the y-axis. Leverage takes on values between 0 and 1; where a 0 value implies no leverage and no effect on the regression model, while values closer to 1 indicate problems (Statistics Columbia, 2012:2). This study found leverage values between 0 (no influence on the model) and 1 (completely determines the model) (min = 0.001 and max = 0.117).

Mahalanobis distance is a scalar measure of where an observation lies within the multivariate parameter space of multiple regression used to detect outliers (Farhani and Hekmatfar, 2011:113). It examines how far scores lie from the centroid of all cases for the predictor variables. It serves the purpose of pattern recognition for the data distribution (Ekstrom, 2011:1). Mahalanobis distance takes on values (min = 0.273 and max = 25.186).The higher the Mahalanobis distance for a case, the more that case's values on independent variables diverge from average values.

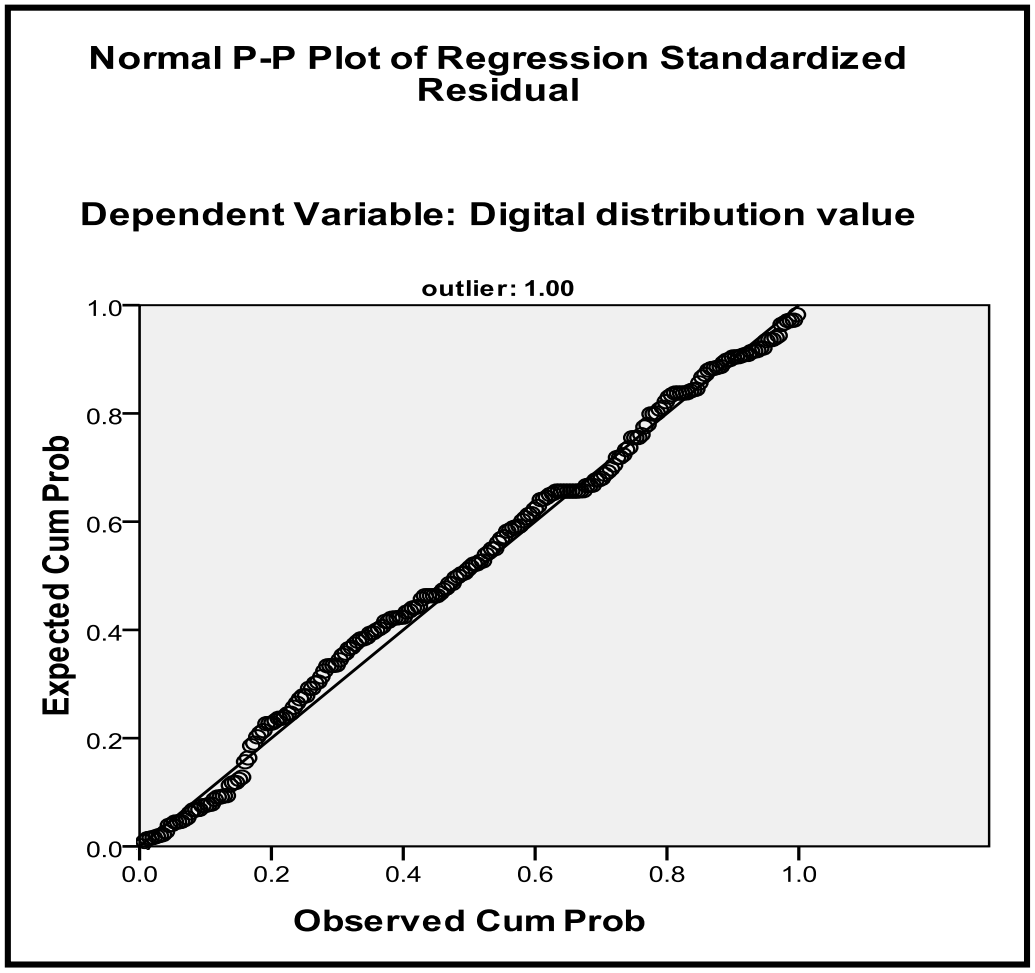
Data assessment is conducted to ensure that the assumption of common variance has not been violated. Hence, when analysing the data for outliers, normality, linearity, homoscedasticity, and independence of residuals, the Normal P-P plot of the regression standardised residual and the scatter plot is consulted.

The original data contained a number of outliers. In regression, these outliers simply identify those cases that are 3 standard deviations away from the best fit line for the regression (Butler, 2008:24). Cook's distance is a measure of influence. It measures the extent to which the line would change if data points were omitted. Points with Cook's distances that are greater than 1, or are larger than other points, may warrant investigation (Butler, 2008).

Normality and Linearity:

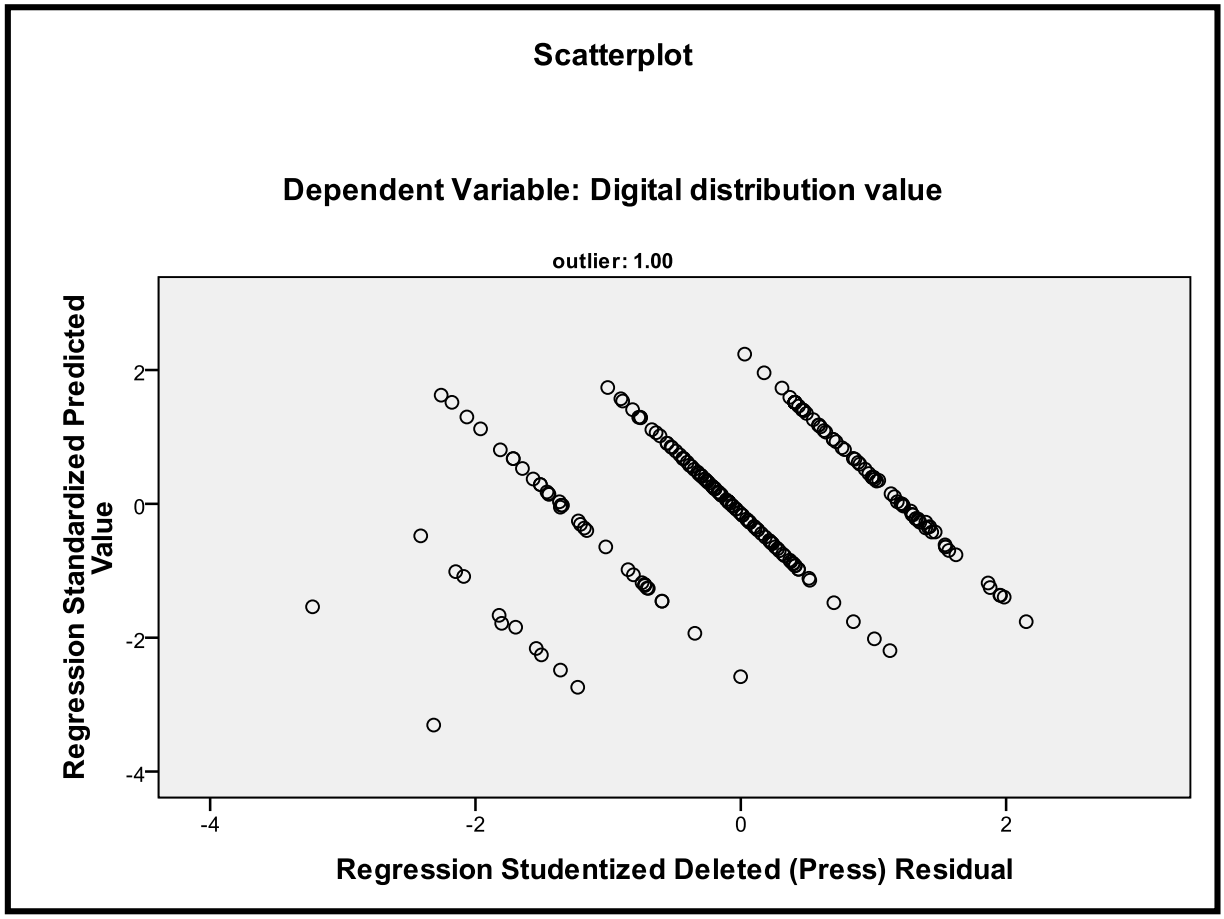
The normal P-P plot validates the assumption that residuals follow a normal distribution. The diagonal line represents the line of expected values and the points which coincide with this line are the expected values. In the normal P-P plot, points lie in a reasonably straight diagonal line from bottom left to top right, suggesting no deviations from normality.

Figure 4.16: Normal Plot Regression Standardised Residual



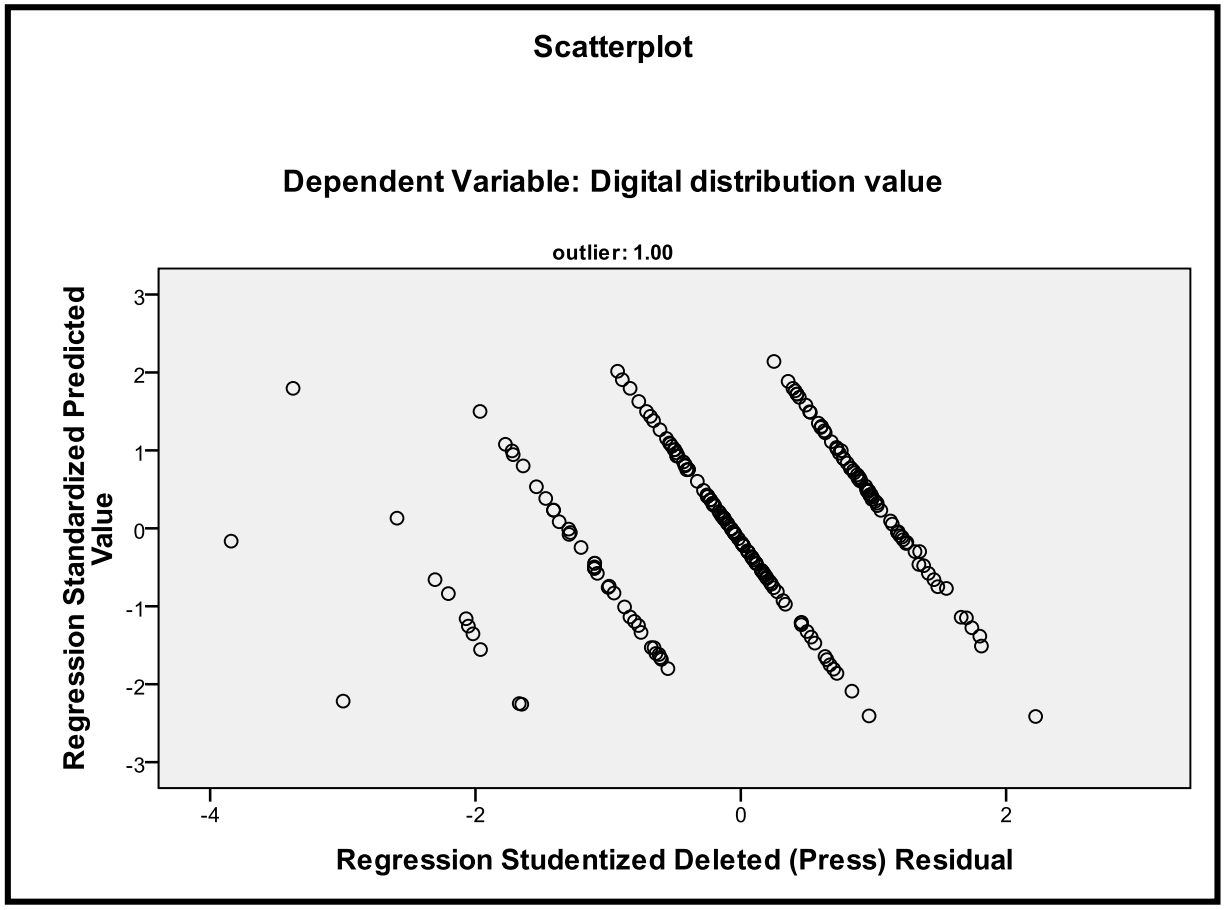
The histogram maintains points between the ranges of -3.3 and +3.3; hence, the introduction of outliers is abolished. The analysis for multiple regression above considers that there was no breach of the assumptions regarding multicollinearity, normality, linearity and homoscedasticity. This renders the formation of three models with regard to one dependent variable.

Figure 4.17: Partial Regression Plot Digital Distribution Value and Music Distribution (Model 1)



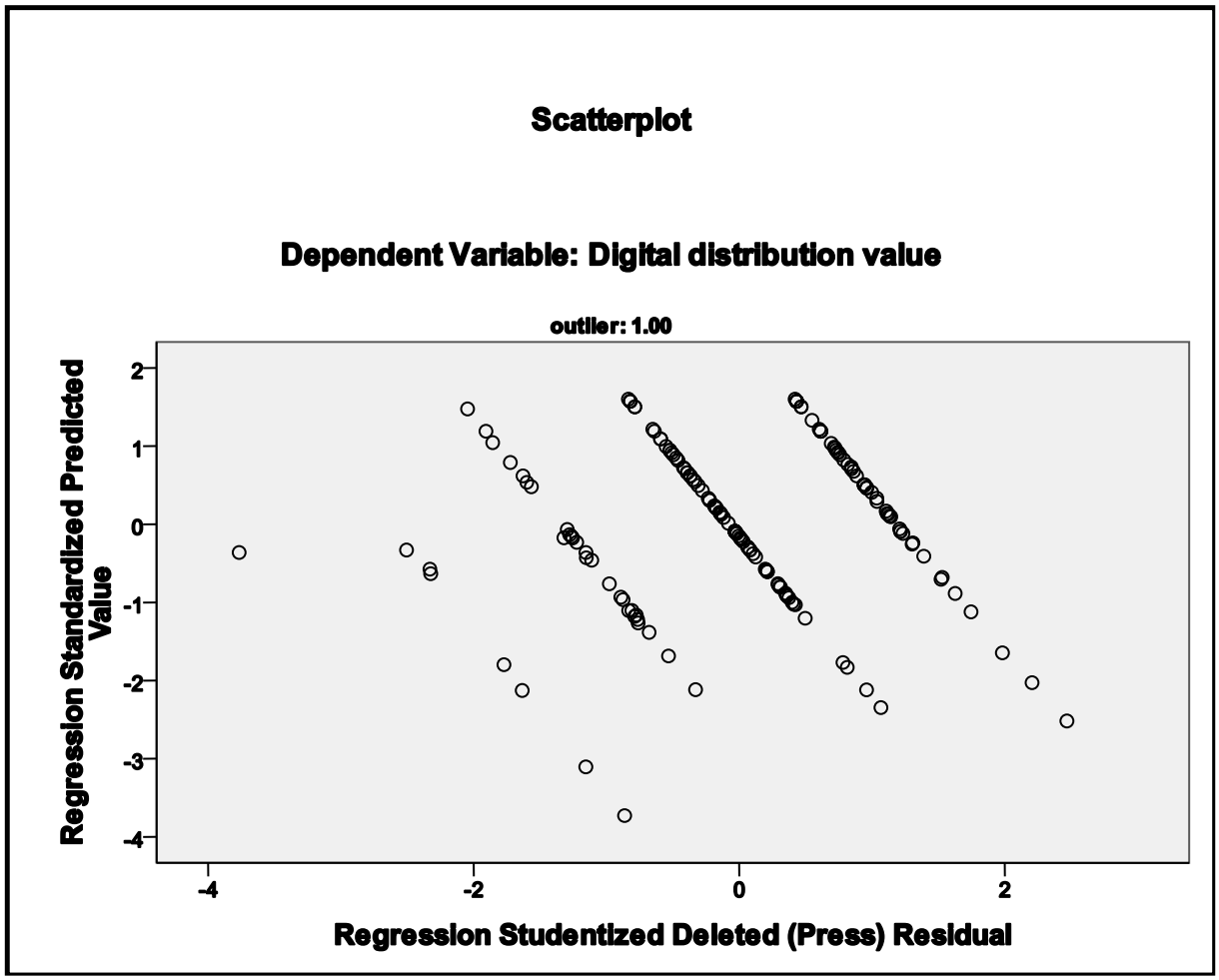
Tentatively, from the scatterplot, the assumption of equal variance has not been violated in the model between digital distribution value and music distribution. Hence, the researcher infers that the model assumes homoscedasticity. The presence of an outlier (an observation that deviates considerably from the other values) should not be a problem due to the large sample size.

Figure 4.18: Partial Regression Plot Digital Distribution Value and Supply and Demand (Model 2)



The regression plot for digital distribution value and supply and demand illustrates homoscedasticity in the model.

Figure 4.19: Partial Regression Plot Digital Distribution Value and Supply Chain (Model 3)



One again, the regression plot for digital distribution value and supply chain competence and capability illustrate homoscedasticity in the model. Homoscedasticity is further confirmed in factor analysis where more than one item loads on the same factor.

4.4.2 Factor Analysis

The reliability of the questionnaire was determined using the method of internal consistency. Cronbach's Alpha value indicates the level of internal consistency by showing construct validity where the constructs are measured with sufficient reliability. Assessing the 22 variables on the 5-point likert scale, Cronbach's Alpha of the instrument is 0.826. According to Cooper and Schindler (2010), acceptable alpha values range from 0.7 to 0.95. Therefore, the researcher infers that the instrument is reliable.

Factor analysis is used to reduce the total number of items to manageable factors. The adequacy of the sample was further determined using the Kasier-Meyer-Olkin (KMO) Measure of Sampling Adequacy. Factor analysis can be conducted using two tests. A principal component analysis was used to extract initial factors and an iterated principal factor analysis was performed using SPSS with an Orthogonal Varimax Rotation. Only item loadings > 0.6 were considered to be significant.

Table 4.14: Rotated Component Matrix

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.812
Bartlett's Test of Spherecity	Approx. Chi-square	1030
	Df	231
	Sif.	0.000

Rotated Component Matrix

	Factor Loading	**Eigenvalue**	**% of Variance**	**Cumulative %**	**Communalities Extraction**	**Alpha**
Factor 1: Bandwidth speed influences Digital Music Consumption						
Digital music consumption	0.668	4.94	22.454	22.454	0.515	0.635
Free online music consumption	0.633				0.495	0.646
Bandwidth speeds	0.608				0.472	0.628
Factor 2: Digital Responsiveness						
Service delivery	0.742	1.824	8.293	30.747	0.479	0.577
Clockspeed	0.605				0.469	0.568
Factor 3: Digital Music Legitimacy						
Regulation	0.722	1.664	7.594	38.31	0.577	0.662
Disintermediation	0.665				0.636	0.609
Copyright laws	0.636				0.527	0.687
Factor 4: Electronic distribution influences and is influenced by Internet Mass Consumption						
Mass consumption	0.814	1.227	5.576	43.886	0.685	0.598
Internet distribution	0.749				0.756	0.6
Factor 5: Digital Alliance						
Value adding innovations	0.73	1.105	5.023	48.91	0.61	0.644
Digital distribution value	0.727				0.647	0.625
Factor 6: Echelon Disintermediation						
Retail music stores	0.685	1.072	4.873	53.782	0.626	0.631
Extraction Method: Principal Component Analysis.						
Rotation Method: Varimax with Kaiser Normalization.						
a. Rotation converged in 13 iterations.						

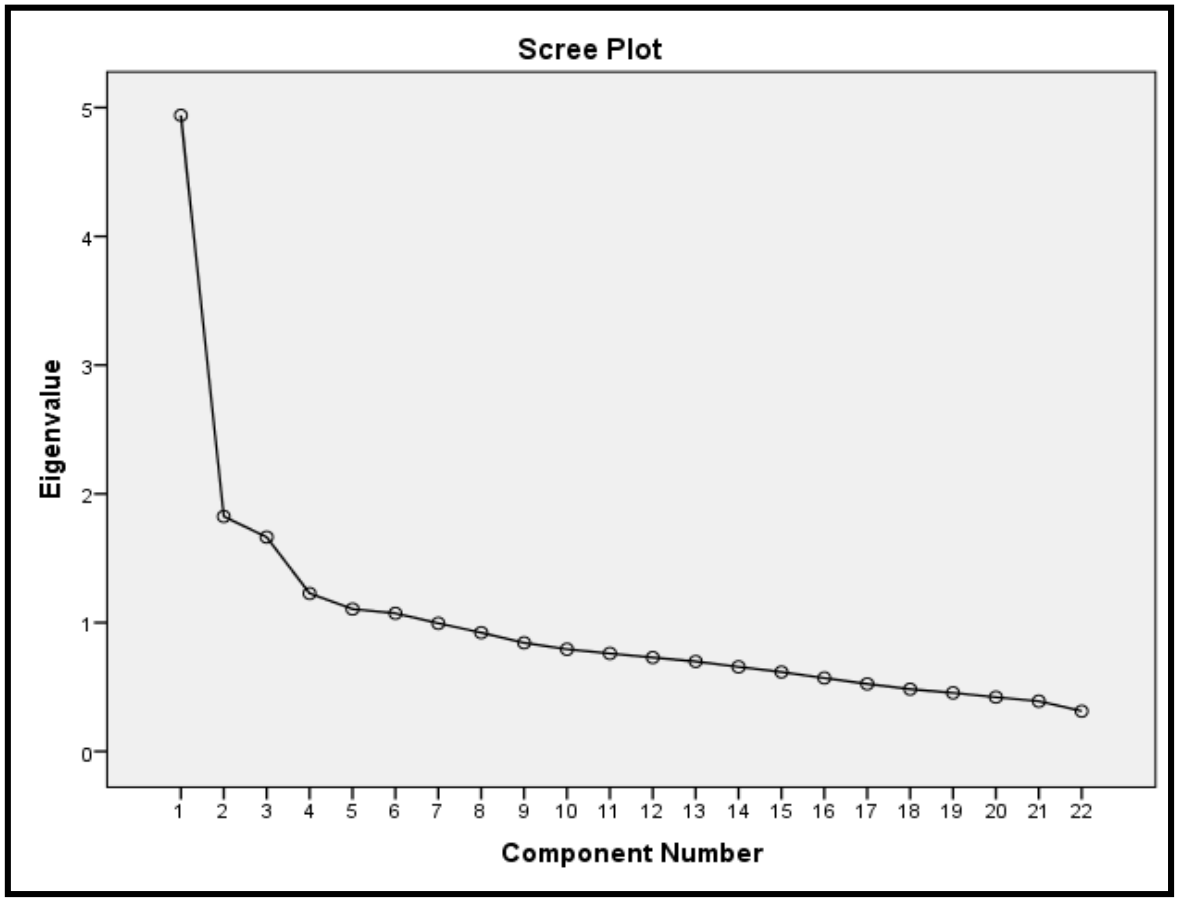
The KMO score of 0.812 > 0.6 indicates sampling adequacy. KMO has a desirable value with a suitable level of variance. Bigger KMO values are good as correlations between potential factors can be explained by other variables. The Bartlett's Test of Sphericity (1030.375) was

used to verify the assumption of homogeneity of variance. The Bartlett's test yielded a significant *p*-value of 0.000 at the 95% confidence level for factor analysis to be deemed appropriate. The significance of the Bartlett's test confirms there is some level of correlation among the variables (Pallant, 2011:323-326). The data matrix therefore has sufficient correlation for the application of factor analysis. The score of 0.812 presented by KMO depicts the strength of the other variables in explaining the correlation between potential factors. The KMO values are therefore good. According to Pallant (2011) "the data set is considered suitable if it is above 0.6". In factor analysis the KMO (0.812) and Bartlett's test of sphericity (1030.375) scores are suitable at degree of freedom (231) (Garson, 2012; Hatcher, 1994).

Communality refers to the amount of variance that can be explained by the common factors of a variable (Pallant, 2011; Saunders *et al.*, 2012). Communality values range from 0 to 1, where 0 indicates that the common factors do not explain any variance and 1 means that the common factors explain all the variance (Pallant, 2011; Saunders *et al.*, 2012). In general, values less than 0.3 indicate that the item does not fit well with the other items in its component. Table 4.14 shows that all items have an extraction value greater than 3; thus the items fit well with the other items in its component.

The factor extraction procedure determines the intention of reducing the complexity of the factors by stating the factor loading in a more clear, understandable and interpretable manner (Costello and Osbourne, 2005; Hatcher, 1994). According to Hatcher (1994:21) "principle components analysis converts a set of observations of possibly correlated variables into a set of values of linearly uncorrelated variables called principal components. The number of principal components is less than or equal to the number of original variables". Garson (2012) notes that the loadings of Likert scales with 0.6 may be considered "high". An alternate way to perform factor extraction is to use Kaiser's criterion or the eigenvalues rule. Using the eigenvalues rule, only factors with a value greater than 1.0 are retained for further investigation. By rule of thumb, any factor that has an eigenvalue of less than 1.0 does not have enough total explained variance to represent a unique factor, and is therefore disregarded (Pallant, 2011; Saunders *et al.*, 2012). In this analysis, components 1, 2, 3, 4, 5 and 6 have eigenvalues greater than 1 and relate to 4.94, 1.824, 1.664, 1.227, 1.105 and 1.072, respectively.

Figure 4.20: Eigenvalue Scree Plot



The purpose of the scree plot is to show variance segmentation data. Points occur in descending order of magnitude of the listed eigenvalues. Therefore the scree plot provides the visualisation pertaining to the relative importance of the factors. This scree plot recognises the first six components as the most important due to their positioning on the upper end of the slope.

Using Kaiser's criterion, the researcher is only concerned with components that have eigenvalue of 1 or more. The factor matrix indicates that all six components have an eigenvalue greater than 1. Factor 1 accounts for 22.454% of the variance, Factor 2 for 8.293%; Factor 3 for 7.594%; Factor 4 for 5.576%; Factor 5 for 5.023% and Factor 6 for 4.873%. As all the important factors that explain the variance have been determined, the factors are 'rotated' to assist in the interpretation. The approach to rotation used is orthogonal, which results in the assumption that the underlying constructs are not correlated (independent). The orthogonal technique used was varimax. Varimax rotation searches for the values of the loadings that bring the total communality prediction closer to the total of the observed variance. The varimax method advocates the discovery of factors, each of which is related to few variables while rejecting the discovery of factors manipulating all variables (Costello and Osbourne, 2005;

Garson, 2012). The intention is to search for the rotated loadings that exploit the variance of the squared loadings for each in order to convert some of these loadings to be smaller in absolute value. A varimax solution yields results which simplify the identification of each variable with a single factor as an orthogonal rotation of the factor axes (Garson, 2012; Pallant, 2011).

The rotated component matrix was used to report the factor loadings for each variable after the factors had been rotated. The rotation gives a clear indication of how each item correlates with each factor. In this research, items with a correlation value of greater than 0.5 were retained (Garson, 2012). Scores in this range are a good indicator of moderate to strong correlation (Bryman and Bell, 2007).

4.4.2.1 Interpretation and labelling of Factors

Costello and Osbourne (2005:3) suggest that purpose of rotation is to simplify and explain the data structure. This study employed factor loadings as the basis for imputing a label to the different factors wherein the researcher examined the most highly or heavily loaded indicators in each column and assigned a factor label. The factor interpretations and labels are confined to the assumption of face valid imputation of factor label (face validity) that is rooted in theory.

Factor 1: demonstrates the greatest variable loadings of the six extracted factors. Subsequently, the loadings on Factor 1 account for 22.454% of the total variance. This factor is categorised according to items related to the three independent variables, being digital music consumption; free online music consumption and bandwidth speed which are influenced by technological value-adding innovations in supply and demand. Thus, they are interpreted as "Bandwidth speed influences Digital Music Consumption".

The literature reviewed and that data analysed suggest that access to bandwidth encourages consumers to listen to more online music. This is done through streaming services where musicians, businesses and Internet radio stations, to name but a few, allow consumers free access to a myriad of music genres through electronically viable mediums. When customers stream music, then are aware of what their likes are and should they wish to download a favourite song, they are faced with the option of downloading free of charge or paying for the song through legal channels such as iTunes. The latter is a centralised distribution system which protects musicians' livelihoods. Diduck (2015) refers to this as a "try-some-buy-some" strategy which unfolds either through encouraging the jump to paid streaming services, or by spurring traditional sales. Just as the Internet is widely accessible to consumers, so too are the millions of

songs created by musicians that are available to download free of charge or at a price, depending on the individual.

Factor 2: Table 4.14 also indicates that two items load significantly on Factor 2 and account for 8.293% of the total variance. The two items relate to service delivery and clockspeed, both of which enhance flexibility in the supply chain through agility. Factor 2 may be thus labelled "Digital Responsiveness". The literature reviewed and the data support the view that the digitalisation of music enables quick/swift response to changing demands and that the Internet is reliable in the delivery of both music services and products in influencing or defining supply chain competence and capability. This results in an agile supply chain system which has been resilient in response to the disintermediation of the music retail industry. Albums that are physically released cannot be compared to those released digitally, as the digital environment gains more exposure by broadening musicians' audience base; eliminates the influence of gatekeepers and facilitates distribution through social networks.

Factor 3: Table 4.14 indicates that three items load significantly on Factor 3 and account for 7.594% of the total variance. One item relates to disintermediation in the supply chain, while the remaining two relate to copyright laws and the regulation and closure of digital services. Hence, Factor 3 can be labelled "Digital Music Legitimacy". Disintermediation is prominent in the literature and in the data generated. The disintermediation of the record label in the traditional supply chain resulted in mass consumption of free, electronically distributed music. As a result, musicians could no longer make a living from physical product sales. Their music could be downloaded from illegal services without paying a fee. This factor loading raises the need for a centralised legal music distribution channel in the South African recording industry, which provides adequate protection for musicians under copyright laws. A solution would be for musicians to rather stream music through centralised distribution channels such as Youtube, iTunes or Spotify. Although the music will not be paid for, it will be streamed. This is a distinction to countering piracy because the termination of websites encourages consumers to rather stream free online music services.

Factor 4: The two critical components relate to items from the mass consumption of music and Internet/electronic distribution; hence, Factor 4 is labelled "Electronic distribution influences and is influenced by Internet mass consumption". The two items loaded significantly on Factor 4 and account for 5.576% of the total variance. The literature on electronic distribution and music consumption abounds in the literature review. As musicians continue to distribute their music through electronic mediums, global access and consumption of music is facilitated by the Internet. These two factors work simultaneously whilst influencing each other. The IFPI (2014)

reported that streaming in the United Kingdom in 2014 accounted for 12.6% of the worldwide user mark, while streaming services Spotify reached the 60 million worldwide user mark. Of the 60 million users, 15 million pay for Spotify's services.

Factor 5: demonstrates two variable loadings which account for 5.023% of the total variance. The two factors are value-adding innovations and digital distribution value. Thus, they are interpreted and labelled as "Digital Alliance". The relationship between the digital distribution of music adding value in the growth of the South African recording industry and the introduction of innovative products (such as iPods) or services (iTunes) adding value to music equates at the level where complementary technologies and devices encourage music consumption and distribution. The DLNA model (Appendix A) confirms this adoption.

Factor 6: posses 4.873% of the total variance and accounts for only one item, namely, retail music stores, which resulted in Factor 6 being labelled "Echelon Disintermediation". This is in line with the view in the literature that Record Store Day was reintroduced to save the retail music sector; this could be a way for musicians to earn an income through the vinyl renaissance.

4.4.3 Reliability and Validity

The reliability of a research instrument is determined using the method of internal consistency. Respondents were asked to rate 22 variables on a 5-point Likert scale where 1 indicated 'strongly disagree' and 5 'strongly agree'.

Table 4.15: Cronbach's Coefficient Alpha: Combined Dimensions of Digital Music

Cronbach's Alpha	No. of items
0.826	22

Cronbach's Alpha was used to test the reliability of the instrument and also depicts the internal consistency of the study. It generally ranges between 0 and 1, and a value closer to 1 indicates a higher degree of internal consistency. Table 4.15 indicates that there is a high degree of internal consistency. Cronbach's Coefficient Alpha value indicates the level of internal consistency by showing construct validity where the constructs are measured with sufficient reliability. Internal consistency is discussed in terms of the interrelatedness among the items in the study. However, interrelatedness of items does not indicate unidimensionality and homogeneity. The dimensions of factors are only found when factor analysis is performed. Hence the reliability statistics

generated from the SPSS indicate that the instrument has a moderate level of internal consistency for reliability as suggested by the Cronbach's Alpha.

Table 4.16: Cronbach's Coefficient Alpha: Individual dimensions of Digital Music Distribution

Dimensions of Digital Music Distribution	No. of items	Cronbach's Alpha
Music Distribution	7	0.656
Supply and Demand	9	0.671
Competence and Capability	6	0.634

Furthermore, Table 4.16 indicates that the questionnaire had a high level of inter-item consistency (Cronbach's Alpha = 0.826), thereby implying that it has a high level of reliability. Item statistics indicate that item reliabilities ranging from 0.7 to 0.95 have acceptable Alpha values. Therefore the researcher infers that the instrument is reliable.

The reliability of each dimension relating to digital music distribution was also assessed. Table 4.16 illustrates that the dimensions of digital music distribution have strong to very high levels of reliability. The reliability statistics range from 0.634 to 0.671, thereby indicating that the items used to measure the dimensions of the study have internal consistency and are hence reliable.

4.5 Conclusion

This chapter analysed the study's results using the various methods discussed in Chapter three. It presented and interprets the results relating to the dimensions of the study. The data findings were described as correlations to the study variables and presented as tabulations. This chapter four lays the foundation for all discussions in relation to the theoretical framework. The results of the data analysis provide supporting evidence for previous studies. However, some of the findings may not correspond with those of other scholars.

CHAPTER FIVE

DISCUSSION OF RESULTS

5.1 Introduction

This chapter discusses the results obtained from the data analysis in relation to the researcher's conceptual framework and the study's objectives. The results determine the standing of the variables within the context of the effects of digital music distribution on the South African recording industry in the Durban region. The objectives of the study and the findings of the literature review are amalgamated with the interpretation of data to discuss the results.

5.2 Biographical data

A total of 217 respondents completed the questionnaire. Based on the data analysed and frequency distribution statistics, 66.4% of respondents belonged to the age category 18-25 years with a range of educational qualifications from matric to the highest qualification of a PhD. The percentage of generation C (aged between 18 and 25) augurs well for the digitalisation of music distribution. Respondents (54.8%) that were 'independent artists' and 'social entrepreneurs' (17.5%) constituted 72.3% of the respondents, pursuing independent careers in music. While 26.7% belonged to a label, around 69.9% of the respondents distributed their music themselves and 30.4% stated that their music was distributed through their record labels. Interesting to note is that 48.4% of the respondents distributed their music electronically; 17.5% through traditional means and 34.1% used both traditional and electronic mediums.

The data analysis further indicates that 53.9% of the respondents create music according to their own artistic tastes, 26.7% according to customer demand and 19.4% of respondents align their music with their label demands. This implies that the respondents were mainly younger and educated people that considered themselves independent artists and social music entrepreneurs and distributed their own artistic music through electronic mediums.

5.3 Discussion relating to research objectives

This section discusses the study's findings in relation to the study's objectives. The analysis makes use of variables that were analysed using SPSS.

Objective One: To explore the challenges confronting the supply chain distribution transition from analogue – brick and mortar – to digital music distribution systems.

The first objective was to explore the challenges confronting the supply chain distribution transition from analogue (brick and mortar) to digital (electronic). It was noted in the literature review that, as a medium of distribution, the Internet led to transition in music distribution in the South African music industry. This study revealed existing demand for brick and mortar (56.2% of the respondents) where retail music stores still facilitate easy access to music distribution, while 43.8% of the respondents, underpinned by 66.4% of the youthful (18-25 years) respondents adapted to digital music distribution systems.

A binomial test found no significant relationship between disintermediation and the closure of retail music stores as the *p* value was greater than 0.05. This not only indicated an insignificant relationship but also implies that respondents did not think retail music stores facilitate easy access to music distribution. However, the literature suggests that the reintroduction of vinyls and "Record Store Day' is the saviour of the physical retail environment (Peoples and Crupnick, 2014). In the dichotomous questions (yes or no), the respondents (82.9%) overwhelmingly stated that online retail music stores better facilitate access to music distribution. The revenue-driven decision looks at the mass consumption of online music (77.4%), although centralisation by means of an online distribution system through online retailers such as Spotify and iTunes has also driven accessibility.

By the same token, the Internet has taken over the role of record labels in managing musicians (61.3%) and the expected consumption level (77.4%) has increased. These findings are supported by those of Adner (2002); Alves (2004); and Lam and Tan (2001) who noted that musicians now control the creation, advertising and distribution of their own music. The Internet has undermined intermediation between record labels and retailers in the traditional supply chain system. The music supply chain disintermediation has allowed artists and consumers to be directly connected through websites as music entrepreneurs. The Internet has slightly (42.4%) contributed to the number of physical music retail stores being absorbed by online music distribution systems. In the traditional era, music distribution was considered a push effect. Advertising by record labels and in-store signings were used as tools to push sales. This strategy is a contrast to contemporary digital music distribution. In the digital era, music

distribution is both a push effect and a pull effect. The push strategy is visible through social media where musicians push their music onto consumers; and the pull strategy is evident where consumers dictate their music needs through social media and online retailers. Consumer needs may range from re-mixes of certain tracks to collaboration with other musicians and creating playlists which are shared with linked users. Brown and Hagel (2008:93) note that "pull models help people come together and innovate." The digital push strategy is effective when online retailers generate broader databases of eclectic genres of music. Electric genres of music ultimately attract more paying or streaming consumers. In this way, the musician attracts a wider fan base and audience by being digitally pushed by consumers and fans.

The findings confirm the disintermediation effect highlighted by Bielas (2013); Look & Listen (2014); McIntyre (2009); Shevel (2014); Stensrud (2014); and Warr and Goode (2011) who noted that the Internet has been responsible for an increase in online music consumption. This resulted in decreased album sales and hence less need for physical retail stores. The consequence is illegal mass consumption of online music results in reduced physical album sales and thereby less need to stock CDs in retail music stores. Previously, record labels withheld royalties from musicians and the distribution of music through the Internet lead to the disintermediation of the supply chain distribution of music in the industry, namely the role of the record labels. The respondents concurred with the challenges noted in the literature in relation to the supply chain distribution system's transition from analogue to digital. A significant portion of the respondents agreed that the traditional supply chain distribution of music experienced a transition with the advent of the Internet in the late 1990s. However, the rejuvenation of Record Store Day is noted to have saved physical retail stores.

New Internet technologies may compel labels that still exist to significantly alter their methods of selling to consumers, as well as how they provide intermediary service to musicians. The record labels' main source of bargaining power with musicians has traditionally been their ability to offer large scale distribution of CDs; and digital technologies threaten this source of strength. A paradox concerning digital Internet technologies is that they simultaneously threaten to terminate the record labels' distribution; as well as the ability to charge consumers for a single music file that has been replicated and sold repeatedly.

Objective 2: To examine the distribution operations processes for the digitalisation of music in relation to the effects of global market demand.

This research objective sought to examine the distribution operations processes for the digitalisation of music in relation to the effects of market demand. The survey instrument gathered data from respondents pertaining to the push-pull strategies used by artists in response to global demand. Six dichotomous questions were structured to ascertain these processes.

A binomial test for the dichotomous questions was used to ascertain whether there is a significant response of 'yes' or 'no'. The data shows that a significant number of the respondents (96.8%) indicated that live music performances are used as a promotional activity. Promotional activities for musicians are referred to as a push effect. The push effect was the result of musicians finding alternate means to make a living as their album sales decreased due to the digitalisation of music. These sentiments are aligned with the work of Dahl (2009); Informa UK (2010); Mortimer, Nosko and Sorensen (2012); and O'Neill (2009) who all allude to the fact that increased demand for live performances was a result of a decrease in albums sales due to file sharing on the Internet. Fitzsimmons and Fitzsimmons (2008:14) note that the product development model driven by technology and engineering could be titled a *push theory of innovation*. The push model is characteristic of manufacturers who develop an innovative product, identify a suitable target and create a distribution channel to push the product to the market (Chaffey, 2015:265).

A significant 90.3% of the respondents indicated that they thought social networking mediums increase the market base for music distribution. Chaffey (2015); and Flurry (2013) confirm that in addition to social media being used as a tool for the pull-based strategy, the use of mobile commerce will grow and become more popular. A large portion of the respondents concurred that online music stores better facilitate access to music distribution (82.9%). Similarly, 87.6% agreed that digital music distribution inspires innovation in the musician and that online music attracts a wider audience (89.9%). This is an indication that online distributors such as iTunes and Youtube are successful in the Durban market as online retailers, based on the responses on "medium of distribution" of the questionnaire. An important balancing strategy identified by Mkhize (2008); and RiSA (2014) is that online retail stores and streaming services are a regulatory medium to reduce piracy in the South African music industry.

The mediums used by musicians to distribute their music are also significant in understanding the push-pull strategies utilised by musicians. Results from the "choice of distribution site" revealed that 52.1% of the respondents' most popular choice of website to distribute music was

social media sites, followed by Soundcloud with 21.7% and iTunes with 18.9%. Surprisingly, SAmp3.com was not the most popular and achieved a representation of 16.6%. The new Napster – bearing in mind that the older Napster created disintermediation in the music industry – is at the lower end of the scale (5.1%). Some of the "Other" categories at 6.5% mentioned by respondents were Youtube, cdbaby, and datafilehost.

Pearson correlation was used to test whether there is an association between SAmp3.com as a distributor and digital music innovation by employing cross-tabulation. The results from the cross-tabulation indicated that those who used SAmp3.com did not think that digital music inspires innovation in the musician as p=0.005. An important point to consider is that of the 83.4% of the respondents who did not use SAmp3.com, 75.6% indicated that digital music distribution inspires innovation in the musician. The researcher infers that there is a relationship or association between respondents using SAmp3.com and digital music distribution inspiring innovation in the musician. The Chi-Square test for independence reaches statistical significance at p=0.005. Therefore, the researcher infers that distribution through SAmp3.com plays an influential role in digital music distribution and inspiring innovation in musicians. The literature and the data analysed strongly confirm the push-pull strategies used in the music industry.

The Internet brings new players and business models to the South African recording industry and is becoming a vehicle that provides strength and focus in the area of digital distribution. Technological advancements have undoubtedly changed the way organisations conduct business and the emergence of centralised digital distribution channels is accelerating to accommodate consumption habits in the South African recording industry.

Objective 3: To evaluate the effects of supply chain value adding innovations in influencing digitalised music distribution and consumption in the recording industry.

This study evaluated the effects of supply chain value adding innovations in influencing digitalised music distribution and consumption in the recording industry by interpreting the frequency distribution and descriptive statistics generated on the respondents' significant agreement or disagreement with factors relating to technological value-adding innovations and their relation to digital music distribution.

According to Alves (2004); and Bockstedt, Kaufman and Riggins (2005) the move towards digitalisation was a result of the large volume of music streamed, downloaded and distributed through the Internet. Some of the factors which attract, enhance or encourage fans to download

music or more music relate to technological viability and compatibility, such as cellular technologies which features DLNA compatibility like the Samsung S6 and LG G4, and home and cellular branding compatibility with Samsung and LG products (Panton, 2008).

A combined percentage of 77.9% of the respondents agreed that digital music distribution has added value in the growth of the South African recording industry. The mean value of 4.05 and standard deviation of 0.9 further indicate that the respondents were in significant agreement that digital distribution has added value to the recording industry. Soosay and Hyland (2004:42) notes that technologically-driven and knowledge-based environments demand a faster flow of information to tap into the best integration of technology. Hence, products which integrate innovative products and music add value to the music industry and enhance competitiveness.

The study's findings also support Leyshon (2009); Pietila (2009); and Waldfogel's (2012) findings in that the Internet plays a role in both the creation and promotion of music entrepreneurs. A significant percentage of 44.7% of the respondents and a mean value of 4 and standard deviation of 0.86 show that similarly, the large majority of the respondents agreed that the Internet plays a role in both the creation and promotion of music entrepreneurs. This confirms Avdeeff's (2012) finding that digitalisation has changed the ways in which consumers conduct their daily activities, including the creation of, access to and consumption of music. Similarly, 85.3% of the respondents agreed (mean value=4.25 and standard deviation=0.84) that the Internet has advanced the methods of digital music distribution. This signifies a close relationship between these concepts and their inter-relatedness in the digital music industry. The success of self-released albums by bands Radiohead and Nine Inch Nails illustrates that, together with innovative digital technologies, the Internet creates music entrepreneurs.

The highest number of neutral responses recorded illustrates that 31.8% of the respondents did not agree or disagree that there is a distinction between traditional music distribution and digital music distribution; however, 37.8% agreed that there is such a distinction. Nonetheless, it was noted that the respondents were in significant agreement that there is a distinction between traditional music distribution and digital music distribution (m=3.78 and standard deviation=0.9). Hence, although the data analysis indicates that respondents were in positive significant agreement that the Internet is a medium of distribution in digital music distribution, the close range or perceptions of the respondents on this item is cause for concern. Cross-tabulation between the variables "music is distributed by" and "medium of distribution" was conducted to gain clarity. The cross-tabulation data yielded inferred that a large portion of the total sample (48.4%) distributed their music electronically, whilst 34.1% of the respondents

distributed their music through both traditional means (physical music retailers) and electronic means. In summary, the correlation *p* value of 0.012 is indicative that there is a relationship between who distributes music and the medium of distribution.

It is interesting to note that no respondents disagreed that complementary technology adoption influences customers to listen to more online music, with a significant 79.8% in agreement. It was noted that the high volume of music downloads is influenced by modular technological developments, such as smartphones; 78.8% of the respondents agreed with this statement. Furthermore, the majority of the respondents (76.5%) agreed that access to technologically compatible media devices influences online downloads. This concurs with Heye and Lamont (2010); and Krause and North's (2014) observation that the distribution of music is facilitated by the flexibility, modularity, and portability of media sharing offered by specific types of devices. Combined, complementary technologies; music downloads and modular technological developments; and technologically compatible devices work together to achieve technological integration and competitiveness by being at the forefront of innovation.

Digital technologies and the Internet have together altered the way in which music is consumed as well as the level of consumption. Rapid technological advances enable consumers to store non-physical products on remote or compatible mobile devices. Thus, the interaction of the consumption and demand of music is two-way as each influence and is influenced by the other. Alves (2004:130) notes that technology not only impacts on customers, but is also shaped by consumer adoption and modification.

Objective 4: To establish the extent of technological viability to which the Diffusion of Innovation theory enhances supply chain distribution competitiveness.

The fourth objective was to establish the extent to which technological viability enhances supply chain distribution competitiveness in line with the Diffusion of Innovation theory. According to Alves (2004); and Evans and Wurster (2000) "developments in technology including an increase in awareness of the MP3 standard, a rise in unlimited Internet and broadband and the proliferation of MP3 devices which are encouraging users to download more despite the downloading of free music." This suggests that the use of the Internet as a medium of digital distribution, coupled with high broadband or bandwidth speeds, has resulted in a large number of downloads.

Frequency distribution and descriptive statistics were used to analyse the responses from this component of the questionnaire. The data analysis for this objective revealed that a large portion of the respondents (77%) agreed that digital music distribution methods have transformed the

consumption of music. A mean value of 4.02 reflects that the majority of respondents agreed that digital music distribution methods have transformed the consumption of music (m=4.02 and standard deviation=0.86). Similarly, 79.3% of the respondents were in significant positive agreement that online music leads to further music consumption. The highest mean value (4.09) and standard deviation (0.91) indicate that the majority of respondents were of the opinion that free online music leads to further music consumption. The data further indicated that 50.2% of the respondents agreed that the current copyright laws offer adequate protection of artists' music rights. This is cause for concern as the lowest mean value of 3.32 and standard deviation of 1.30 indicate that the respondents neither agreed nor disagreed that the current copyright laws offer adequate protection of music rights. The increase in illegal music downloads has not only deprived musicians of their livelihoods, but has also resulted in the closure of physical music retailers. This calls for action by the RiSA and the stringent measures advocated by Bernardo and Martins (2013); and IFPI (2014) to reduce theft and piracy through Digital Rights Management (DRM) and Intellectual Property Rights (IPR).

It is interesting to observe that no respondents strongly disagreed that complementary technology adoption influences customers to listen to more online music with more than three-quarters (79.8%) agreeing. However, the mean value of 4.04 shows that the respondents agreed that complementary technology adoption influences customers to listen to more online music. Furthermore, 78.8% of the respondents agreed that the high volume of music downloads is influenced by modular technological developments such as smartphones. The second highest mean value (4.08) and standard deviation (0.92) similarly show that the majority of respondents agreed that music downloads are influenced by modular technological developments such as smartphones. This is confirmed in the work of Alves (2004); and Sweeny and Ryan (2008).

A significantly large number of respondents agreed (66.9%) that access to high bandwidth speed influences online downloads; coupled with a mean value of 3.8 and standard deviation of 0.88, this indicates that the respondents agreed that access to high bandwidth speed influences online downloads. In addition, access to technologically compatible media devices influences music downloads (m=3.97 and standard deviation=0.85) and technological advancements that encourage independent music production (m=4.06 and standard deviation=0.95) are significant contributors to online music consumption. The IFPI (2014); Lam and Tan (2001); and Sweeny and Ryan (2008) attribute the growing popularity of downloads to technological developments due to the increase in downloading as a result of the movement towards broadband communication in the home, giving consumers high speed connection and faster downloads. This was confirmed by majority of the respondents that agreed (76.5%) that access to technologically compatible media devices influences online downloads. Similarly, 74.2% of the

respondents strongly agreed that technological advancements encourage independent music production. Hence, the data analysed for this objective indicates that respondents were in positive significant agreement with the supply and demand strategies used in digital music distribution.

The results of the data analysed for supply and demand indicate that the strategies used by musicians in the music industry promote competitiveness as factors such as high bandwidth speed; complementary technologies; and access to compatible media devices have been adopted by the respondents. It is also important to note that due to the Internet creating a portal for digital innovation in music, digitalisation has facilitated the entrance of small independent labels to the music industry, as well as music entrepreneurship (Pietila, 2009; Waldfogel, 2012) and the rise of digitally-driven music consumption.

Objective 5: To assess the relative magnitude of the supply chain competence and capability response to digital supply chain music distribution.

The final objective was to assess the relative magnitude of the supply chain competence and capability response to digital supply chain music distribution. The third and final component of sub-section C used six variables to ascertain the effectiveness of the digital supply chain.

The results generated by frequency distribution, correlation between variables and descriptive statistics indicate the respondents' significant agreement (77.8%) that the introduction of innovative products (such as iPads) or services (iTunes) adds value to music. The mean value for this variable was m=4.09 and the standard deviation=0.96, indicating that the respondents affirmed that the introduction of innovative products (such as iPods) or services (iTunes) adds value to music. The evidence suggests that 83.8% of the respondents agreed that music tracks can be re-mixed and uploaded in a shorter period than during the CD era. The mean value revealed for the response time for musicians to remix and upload digital tracks is m=4.2 and standard deviation=0.79, indicating that respondents are in significant agreement that the response time of the digital supply chain is flexible and efficient. This is confirmed by Simchi-Levi *et al*. (2009) who note that flexibility is the ability to respond to change, thereby implying that the distribution is flexible.

None of the respondents strongly disagreed that the digitalisation of music enables quick/swift response to changing demands; while 72.4% agreed with this statement. The mean of 3.95 and standard deviation of 0.79 imply that the clockspeed of the digital supply chain is efficient in distributing music in a short period of time, which sets the process apart from traditional music distribution. Simchi-Levi *et al.* (2012) identify technology clockspeed as an innovation that is

continually advancing and is used to create competitive advantage, thus enabling the system to be highly competitive.

The fact that a significantly large number of the respondents agreed (70.5%), together with a mean value of 3.86, that the Internet is reliable in the delivery of both music products and services is a clear indication of the veracity of this statement. Thirty per cent of the respondents agreed and 45.6% strongly agreed that technological advancements have facilitated the evolution of digital music. Furthermore, the mean of 4 and standard deviation of 0.85 affirm that technological advancements create supply chain competitiveness. Tidd and Bessant (2009) observe that innovative tools such as technological advancements create competitive advantage among musicians in the music industry. Finally, the mean of 4.11 and standard deviation of 0.98, together with a significant agreement (78.8%) by the respondents indicate that the Internet is the most effective way to continuously provide updated or new music offerings to the consumer. According to Stevenson (2012) a lean operation is a flexible system of operation that uses considerably fewer resources than a traditional system and lean systems achieve greater productivity and lower costs. This means that the Internet as a medium of digital music distribution provides lean or just-in-time distribution for products and services.

Pearson correlation was used to examine the relationship between the dependent variable (digital distribution value) and the independent variables comprised of digital consumption and clockspeed delivery. There is a statistically significant positive relationship between digital music distribution and the impact it has had on music consumption as $p < 0.05$, thereby rejecting the null hypothesis; and this is the result of access to high bandwidth speed as $p < 0.05$. Therefore, there is a strong positive correlation between digital distribution value and the supply chain's competency in digital consumption and clockspeed delivery, as both null hypotheses were rejected, thereby revealing the relationship positive and acceptable. The dynamics of competitive interactions are supported by the data analysis for competence and capability as the results indicate that respondents were in positive significant agreement with supply chain competence and capability in digital music distribution.

5.4 Conclusion

The current complement of musicians have moved away from traditional ways of doing business in the music industry. The literature reviewed and the data analysed confirm that the Internet and the illegal downloading of music have caused disintermediation in the distribution of music. Globally, physical retail music stores have experienced declining profits, leading to

closures. As musicians could no longer earn a livelihood from physical album sales, they adapted to the transition caused by digital enabling technologies and assimilated them to fit the virtual online marketplace. Activities such as live performances and the sale of merchandise as well as peer-to-peer sharing services are used as promotional tools to make up for the lack of album sales. Musicians have gone a step further to cut their ties with record labels and have moved towards independent music production and music entrepreneurship, thereby assuming 360 degree control of their music and services. South African musicians are following these global trends. However, there is cause for concern with regard to the current copyright laws that seek to protect musicians as well as the sudden downtime of the official regulatory South African music website, the "RiSA". Musicians are concerned about the effects of piracy and illegal downloading in the South African market which affects their income. More stringent measures are required to control music services and to regulate them through efficient channels, such as Deezer, Spotify or iTunes. The iTunes store which opened its official South African online store in 2012 (Ramkissoon, 2012b:1), is the most successful online music retailer.

This study has thus shown that technology should be embraced as a critical driver in the digital sphere of music distribution and its implementation by Durban musicians is evident.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This research study makes a positive contribution to understanding the digital supply chain distribution of music in the South African recording industry in the Durban region. Although some limitations and delimitations were identified, strong conclusions were drawn regarding digital music distribution in the Durban region. Based on the knowledge gained, future research could assist the country's recording industry.

6.2 Conclusions arising from the Major Findings

Digital music distribution has its origins in the unauthorised file-sharing phenomenon of the late 1990s. As peer-to-peer networks become popular, a digital music value chain emerged comprising of music distribution on the Internet through personal computers, portable media devices and cellular phones.

In examining digital supply chain music distribution, the study's five objectives were to:

- To explore the challenges confronting the supply chain distribution transition from analogue – brick and mortar – to digital music distribution systems.
- To examine the distribution operations processes for the digitalisation of music in relation to the effects of global market demand.
- To evaluate the effects of supply chain value adding innovations in influencing digitalised music distribution and consumption in the recording industry.
- To establish the extent of technological viability to which the Diffusion of Innovation theory enhances supply chain distribution competitiveness.
- To assess the relative magnitude of the supply chain competence and capability response to digital supply chain music distribution.

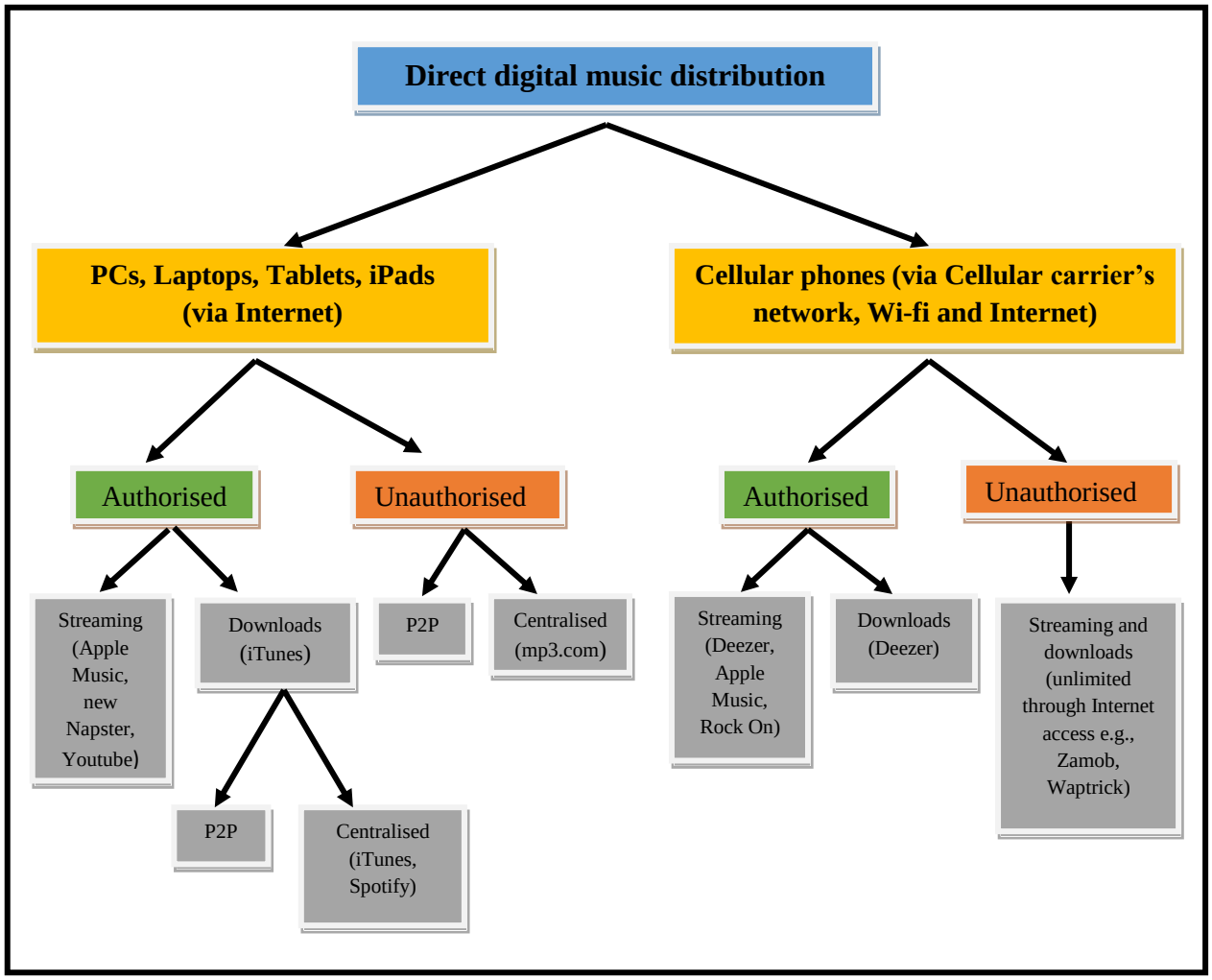
It is important to note that, as a medium of distribution, the Internet both influences and is influenced by consumer interaction. Hence, the roles of the different variables in the research such as consumption, demand, efficiency, and bandwidth speed are interrelated and encourage

consumers to consume or distribute within the process. It is evident that the respondents agreed that there has been a transition from traditional music distribution to digital music distribution by acknowledging the impact of the Internet on the disintermediation of record labels. The Internet has resulted in mass consumption of music downloads which resulted in reduced sales of musicians' CDs; however, their adaption to technology and social media yields far better results. Musicians now consider themselves music entrepreneurs and independent artists. Some have taken the 360 degree route and completely management their own profiles. As a medium of distribution, the Internet creates supply chain competency and offers musicians the tools they require to succeed in a competitive market. Furthermore, music nowadays is no longer confined to the musician's geographic location; a musician's talent can reach any part of the globe, even remote villages as access to the Internet and a compatible device is all that is basically required.

The main area of concern is Digital Rights Management (DRM). Although respondents were in general agreement that the current copyright laws provide adequate protection of artists' music rights, the result was marginal indicating that uncertainty surrounds the protection of musicians' rights. Furthermore, the respondents agreed that regulation and closure of various digital distribution services will reduce the illegal downloading of music. Theft and piracy is a global phenomenon which requires urgent attention. According to Britton (2015), illegal music sharers in the United Kingdom could face ten years in jail according to new government plans. The RiSA should consider implementing stringent control measures and watertight regulation to reduce theft and piracy.

Figure 6.1 presents a summarised diagram of the literature review and the study's major findings on digital music distribution in the Durban region.

Figure 6.1: Scenarios for Digital Music Distribution



Source: Developed by researcher from the study's findings.

DRM has been used as a strategic mechanism to tie content to different components, addressing inadequacy in the digital value chain. Two types of models arose from authorised music distribution. The first is device-centric and is the exclusive domain of Apple's iTunes Music Store and the second comprises of online music stores selling music supported by Windows Media Player (WMP) relating to a software-centric model. Recently, mobile or cellular services have added a third category (network-centric) where both the portable player and content are tied to the delivery channel (the carrier's network). The network-centric model not only increases scarcity in the digital value chain, but also shifts certain aspects of control back to network operators. However, as mobile networks improve, music phones also complement P2P sharing techniques by enabling consumers to share and exchange music through social media applications such as Whatsapp. Music sharing through social media channels such as Whatsapp is illegal, if the sending party does not have ownership of the content being shared thereby

posing a negative development for musicians if their music is transferred without legal ownership.

Music downloading continues to emerge as an efficient method for distributing music given the following basic preconditions:

- Advances in audio compression technology;
- End user resources including PC storage capabilities, and sufficient processing power to distribute music, such as Soundcloud;
- Internet connectivity through high bandwidth speed access by end-users; and
- Efficient practice or distributing music through social media.

These components were interchangeable and were personalised by consumers, providing a loosely-coupled infrastructure for the distribution and consumption of unprotected music files at a rate that crippled the music industry. The central triggers in digital music distribution are related to technology, regulation and social media. These triggers cause a transition in digital distribution in both authorised and unauthorised mediums. The objectives discussed in the literature apply to digital music distribution in the Durban music industry.

6.3 Recommendations arising from the findings

The recommendations suggest various improvements that address the issues identified in this study. These include recommendations made by previous scholars as well as contemporary literature on the subject. Suggestions are also made for future research that could enhance understanding of digital music distribution in the Durban region. Based on the analysis of the data and the discussion of the study's results, its objectives were achieved and the research questions were answered. The study identified the problems in the Durban music industry in relation to DRM. DRM has been used as a strategic mechanism to tie content to different components, introducing scarcity in the digital value chain. The reason hereof is that there is now a lack of control on the content being disseminated. It was noted that of the 217 respondents, 26.7% belonged to a label, 54.8% were independent artists and 17.5% considered themselves music entrepreneurs. However, 69.9% of the respondents stated that they distribute their music themselves while 30.4% reported that their music is distributed by their label. Some musicians distribute their music both electronically and using tradition means (34.1%); while 48.4% used only electronic means and 17.5% only used traditional means. This suggests that there are two approaches to dealing with piracy, offline (traditional) and online (digital).

In dealing with DRM in the traditional business sphere, protection of intellectual property rights and copyright protection and regulation falls under the umbrella of the RiSA that is the main body representing the South African recording industry. Musicians require protection and regulation of their copyright as well as protection against the illegal activities of peer-to-peer networks. Thus, the RiSA should adopt more stringent measures to address piracy. Stringent laws and tougher penalties could reduce music downloads and encourage consumers to purchase physical products.

On the other hand, because music is consumed on a massive scale through the Internet, DRM can be used to tie software and/or hardware compatibility to devices, thereby enabling music to be downloaded on a wider scale rather than being restricted. However, increased copyright protection could reduce music downloads and encourage customers to purchase physical products or digital products from authorised online retailers. The device-centric model enables authorised distribution services through a legal, authorised online retailer. It was found that 19% of the respondents distribute their music through iTunes and 52% through social media websites.

It is evident from the literature and the data analysed that society has adapted to the digital age. The benefits of listening to music through Internet streaming are overtaking traditional distribution domains. Whereas a physical product had to be shipped internationally weeks in advance of new releases, nowadays music can be instantaneously and conveniently delivered by electronic means to consumers across the globe. Consumers no longer face 'out-of-stock' situations and physical inventory is replaced by compressed files. Some of the long-term advantages of steaming music are:

- Music reaches a wider audience;
- If a consumer cannot afford to buy a physical product, they can stream an album online. Where the consumer cannot afford to buy the CD, they can legally listen to an album online. Although consumers may not be buying the CD, they are investing in the future of the band by saving money to attend a live performance or purchase band merchandise. This is a win-win situation. Money generated from merchandise sales assists musicians to create a new album; and
- Musicians do not necessarily want to make large scale profits from streaming or downloads; many create and distribute music in order to fulfil their aesthetic needs. Profits and sales do not always matter to musicians as music, creativity and collaboration is born from passion for music.

Streaming music can be achieved at no cost or by paying for the service. A balance is thus required between counteracting digital piracy and the willingness to pay for digital products.

It is evident from the discussion on the study's findings and its recommendations that there are solutions to the factors that contribute to the problems experienced by musicians in the Durban music industry. Stricter laws and regulations regarding copyright protection and music downloading need to be adopted and implemented in response to the increased growth and consumption of digital music. This would reduce or prevent online piracy that affects businesses, consumers and the wider economy both online and offline. Imposing tougher penalties for business-scale online offences will offer greater protection to business and will send a clear message that deters criminals from piracy.

6.4 Contribution to knowledge

One of the contributions of this research study is to make musicians in the Durban region aware of the mediums of music distribution, as well as most frequent route used by musicians to distribute music. Identifying the effects of digital music distribution will enable musicians to identify the shortcomings of traditional distribution and the gateway of offerings the new digital distribution creates. Providing insight into problems will enhance the economic viability and regulation in the music industry. This could assist musicians in the Durban region to reach the next level and ensure that South African musicians are on par with global market strategies of digital distribution, thereby promoting the availability of the country's diverse music offerings at the global level.

6.5 Limitations and Delimitations

This study examined the digital supply chain distribution of music in the South African recording industry in the Durban region. Due to the different types of musicians (through record labels, music entrepreneurs, and independent musicians) operating in Durban, the survey focused on the mediums of distribution employed by these musicians. The sample size was more than ample and the responses produced illuminating results. The measurement instrument used was quantitative; however, a qualitative research approach would have enabled the researcher to interview musicians and further probe certain issues. An important point to note is that although the RiSA is the main body representing the South African recording industry with a list of members in KZN, their downtime prevented access to a list of these musicians. To

address this problem - communicating through social media, personally attending live performances and promotional events allowed direct access to the musicians in order to administer the questionnaire. Throughout the study, its objectives were addressed by combining the discussion of the results with the research questions.

6.6 Opportunities and Directions for Further Research

This study on the digital supply chain distribution of music in the South African recording industry in the Durban region could assist with the identification of the positive and negative aspects of distributing music traditionally and digitally. The identification of problems relating to DRM could assist the industry to reduce illegal downloading and piracy. It was observed that a large number of musicians have migrated to producing music independently and as social entrepreneurs. Further research on both categories could assist future musicians with guidance on this process as well as shortcomings. Furthermore, a qualitative research approach with the ten top-ranked Durban musicians could assist the music industry to identify alternate distribution mediums. It is recommended that further research be conducted on other South African musicians residing in Johannesburg and Cape Town. Finally, music accessibility and compatibility in relation to cellular network providers could be investigated in order to determine whether unlimited data inflates music downloads to another level.

A crucial point is that, due to the increase in the number of musicians operating as entrepreneurs and independently, it is not possible for the RiSA or the South African recording industry to keep an anthology or database of South African musicians. It is thus recommended that a model be developed to keep a record of musicians based on their geographical region, or collectively as South Africans. At the moment, there is no body that can confidently confirm the total number of musicians in the South African market.

6.7 Summary

This study aimed to understand the digital supply chain distribution of music in the South African recording industry in the Durban region. The data was collected from a sample of 217 musicians and focused primarily on the variables identified in the literature review.

The challenges confronting musicians in relation to the transition from traditional to digital music distribution were identified in the literature review and it is evident that they are

occurring on a global scale. The advent of the Internet resulted in online music consumption. As there were no digital protection rights to the file, files could be replicated and sold hundreds and thousands of times. This bypassed the traditional route of physical CD sales which, in turn, resulted in decreased album sales and the disintermediation of supply chain distribution and closure of music stores. However vinyl records made a return in 2014 which shifted the sale of physical format product offerings. Realising that they needed to go with the flow, musicians adapted to the digital market and began distributing their music through legal channels such as iTunes, SAmp3.com, social media sites, and Youtube. The interaction between the musician and the customer or fan is a push-pull effect which encourages direct interaction and in some instances results in the consumer becoming the distributor. The introduction and further enhancement of portable devices encourage music downloads through PCs, iPads, and cellular devices and brand compatible technologies influence digital music distribution and consumption in the recording industry. These two factors work together and influence and are influenced by each other. In addition, complementary technology not influences music downloads, but also encourages music innovation and creation. Music can be created while sitting at Wimbledon or in home studios with compatible software that enables musicians to explore, create and collaborate with other musicians to re-mix music tracks and release them in a short space of time, thereby making the digital supply chain extremely efficient in music delivery and competency. The digital supply chain is competitive as it uses technological viability to enhance supply chain distribution competitiveness.

The variables set out in the study were fully explained and the factors were outlined and linked to the research questions. The answers to the questions and interpretations were controlled by recommended means in order to assess the future of the music industry in Durban. The recommendations flow from the interpretation of the effects of digital music distribution in the Durban music industry.

BIBLIOGRAPHY

Adner, R. (2002) *Online music battles: FullAudio vs. Pressplay*. [online], available: http://faculty.insead.edu/adner/PREVIOUS/Projects%20May/Online%20music%20Final.pdf [7 July 2014].

Al-Jabri, I.M. and Sohail, M.S. (2012) 'MOBILE BANKING ADOPTION: APPLICATION OF DIFFUSION OF INNOVATION THEORY', *Journal of Electronic Commerce Research*, 13(4): 379 – 391.

Alves, K. (2004) *Digital distribution music services and the demise of the traditional music industry: three case studies on Mp3.com, Napster and Kazaa*. [online], available: http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1008&context=thesesinfo [21 July 2014].

Armstrong, C. (2015) *HOW DID VINYL MAKE ITS COMEBACK.* [online], available: http://diffuser.fm/how-did-vinyl-make-its-comeback/ [16 May 2015].

Avdeeff, M. (2012) 'Technological engagement and musical eclecticism: An examination of contemporary listening practices', *Participations: Journal of Audience and Reception Studies*, 9(2): 265 – 285.

Babbie, E. and Mouton, J. (2006) *The practice of social research*, 6th ed., South Africa, Cape Town: Oxford University Press.

Bacache, M., Bourreau, M., and Moreau, F. (2014) *Digitalization and Entrepreneurship: Self-releasing in the Recorded Music Industry*. [online], available: http://webmeets.com/files/papers/EARIE/2014/442/autoprod_15Feb2014.pdf [6 December 2014].

Baltagi, B. H. (2011) *Econometrics.* (5.baski). Berlin: Springer.

Bell, J. (2010) *Doing Your Research Project*. 5th ed., Maidenhead: Open University Press.

Benjamin, R. and Wigand, R. (1995) *Electronic Markets and Virtual Value Chains on the Information Superhighway*. [online], available: http://sloanreview.mit.edu/article/electronic-markets-and-virtual-value-chains-on-the-information-superhighway/ [2 December 2014].

Benton, W.C. (2014) S*upply Chain Focused Manufacturing Planning and Control*, United States: Cengage Learning

Bernard, H. R. (2000) *Social Research Methods: qualitative and quantitative approaches.* Boston: Sage.

Bernardo, F. and Martins, L.G. (2013) *Disintermediation effects in the music business – A return to old times?* [online], available: https://musicbusinessresearch.files.wordpress.com/2013/06/bernardo_desintermediation-effects-in-the-music-business.pdf [2 December 2014].

Bernasek, A. (2014) *Two Numbers: Vinyl Records Are Back.* [online], available: http://diffuser.fm/how-did-vinyl-make-its-comeback/ [12 May 2015].

Bielas, A (2013) *The Rise and Fall of Record Labels*. [online], available: http://scholarship.claremont.edu/cgi/viewcontent.cgi?article=1595&context=cmc_theses [19 August 2014].

Bizcommunity. (2011) *Digital music sales only 5%-6% of SA market.* [online], available: http://www.bizcommunity.com/Article/196/394/68569.html [21 August 2014].

Black, K. (2011) *Business Statistics: For contemporary decision making. 7th ed. USA: John Wiley and Sons Inc.*

Bless, C., Kagee, A. and Higson-Smith C. (2006) *Fundamental of Social Research Methods: An African Perspective*, 4th ed., South Africa: Juta and Company Publishers.

Bockstedt, J., Kaufman, R. and Riggins, F. (2005) *The Move To Artist-Led Online Music Distribution: Explaining Structural Changes In The Digital Music Market*. [online], available: http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=1385598 [30 March 2014].

Bowersox, D.J., Closs, D.J., and Cooper, M.B. (2007) *Supply Chain Logistics Management*. 2nd ed., Michigan State University: McGraw Hill International Edition.

Bowersox, D.J., Closs, D.J., and Cooper, M.B., Bowersox, J. C. (2013) *Supply Chain Logistics Management*. 4th ed., Michigan State University: McGraw Hill International Edition.

Britton, L.M. (2015) *Illegal music sharers could face 10 years in jail according to new government plans.* [online], available: http://www.nme.com/news/various-artists/86989 [20 July 2015].

Brooks, C. (2008) *Introductory econometrics for finance.* 1st ed. Cambridge: University Press.

Brown, J.S. and Hagel, J. (2005) *The next frontier of innovation*. [online], available: http://www.cfo.com/printable/article.cfm/4503443?f=options [17 July 2014].

Brown, J.S. and Hagel, J. (2008) 'From Push To Pull: Emerging Models For Mobilizing Resources', *Journal of Service Science*, 1(1): 93-110.

Bryman, A. and Bell, E. (2007) *Business Research Methods*, 2nd ed., New York: Oxford University Press.

Brynard, P.A. and Hanekom, S.X. (1997) *Introduction to Research in Public Administration and related academic disciplines*, Pretoria: van Schaik.

Butler, S.N. (2008) *Perspective Aperture Widths during Teleoperation*. 1st ed. USA: Proquest.

Baym, N.K., and Burnett, R. (2009) 'Amateur experts: International fan labor in Swedish independent music', *International Journal of Cultural Studies*, 12(5): 433 – 449.

Carr, N.G. (2000) 'Hypermediation: Commerce as Clickstream', *Harvard Business Review*, 77(1): 43-47.

Castellano, S., Ivanova, O., Adnane, M., Safraou, I., and Schiavone, F. (2013) *Back to the future: adoption and diffusion of innovation in retro-industries*. [online], available: http://www.emeraldinsight.com/doi/pdfplus/10.1108/EJIM-03-2013-0025 [1 December 2014].

Chaffey. D. (2015) *Digital Business and E-Commerce Management Strategy, Implementation and Practice*, 6th ed., London: Pearson.

Chase Jr, C.W. (2013) *Demand driven forecasting.* 2nd ed. Oxford: Wiley Publishers.

Chang, H.C. (2010) *A New Perspective on Twitter Hashtag Use: Diffusion of Innovation Theory*. [online], available: http://onlinelibrary.wiley.com/doi/10.1002/meet.14504701295/pdf [1 December 2014].

Chircu, A.M. and Kaufman, R.J. (1999) *Strategies for Internet Middlemen in the Intermediation/Disintermediation/Reintermediation Cycle*. [online], available: http://aws.iwi.uni-leipzig.de/em/fileadmin/user_upload/doc/Issues/Volume_09/Issue_01-02/V09I1-2_Strategies_for_Internet_Middlemen_in_the_Intermediation-Disintermediation-Reintermediation_Cycle.pdf [16 August 2014].

Chowdhury, S., Bergquist, M. and Akesson, M. (2014) *Architectural Characteristics of Digital Services Enabled by Embedded Technology: A Study on Remote Diagnostics Services*. [online], available: http://www.academia.edu/4774779/Chowdhury_S._Bergquist_M._and_%C3%85kesson_M._Architectural_Characteristics_of_the_Digital_Services_Enabled_by_Embedded_Technology_A_Study_on_the_Remote_Diagnostics_Services_Accepted_for_the_Hawaii_International_Conference_on_System_Sciences_HICSS_2014 [3 December 2014].

Churchill, G.A., Brown, T.J., and Suter, T.A. (2010) *Basic Marketing Research,* 7th ed., South Western: Cengage Learning.

Cooper, D.R. and Schindler, P.S. (2010) *Business Research Methods,* 8th ed., New York: McGraw Hill.

Costello, A.B. and Osbourne, J.W. (2005) *Best Practices in Exploratory Factor Analysis: Four Recommendations for Getting the Most From Your Analysis.* [online], available: http://pareonline.net/pdf/v10n7.pdf [20 August 2015]

Coupey, E. (2005) *Digital Business: Concepts and Strategy*, 2nd ed., New Jersey: Pearson Prentice Hall.

Creswell, W. (2014) *Research Design,* 4th ed., University of Wisconsin. Thousand Oaks, California: Sage.

Dahl, K. (2009) *A Change is Gonna Come: The Future of Copyright and the Artist/Record Label Relationship in the Music Industry*. [online], available: http://www.rslaw.com/wp-content/uploads/2011/12/1255020173Kurt-Dahl-Thesis-2-S0272156.pdf [2 December 2014].

De Vaus, D. A. (2002) *Surveys in social research*. 5th ed. Australia: Routledge.

Dewenter, R., Haucap, J. and Wenzel, T. (2012) 'On File Sharing with Indirect Network Effects Between Concert Ticket Sales and Music Recordings', *Journal of Media Economics,* 25(3): 168-178.

Diduck, R. (2015) *Bandwidth: Streaming might be the future, but is it an unfair economy that exploits artists?* [online], available: http://www.factmag.com/2015/08/24/fact-mix-510-throwing-shade/ [23 August 2015].

Diffusion of Innovations. (2014) *Diffusion of innovations*. [online], available: http://diffusionofinnovations.weebly.com/ [26 June 2014].

Digital Living Network Alliance (DLNA). (2014) *Our Organization*. [online], available: http://www.dlna.org/dlna-for-industry/our-organization [12 September 2014].

Downing, D and Clark, J. (2003) *Business Statistics.* 4th Edition. New York: Barrons Educational Series.

eCommerce Awards 2014. (2014) *eCommerce Awards Website*. [online], available: http://www.ecommerceawards.co.za/ [26 July 2014].

Ekstrom, A. (2011) *Mahalanobis Distance Beyond Normal Distributions.* [online]. available: http://www.google.de/url?sa=tandrct=jandq=andesrc=sandfrm=1andsource=webandcd=6andsqi=2andved=0CE8QFjAFandurl=http%3A%2F%2Fstatistics.ucla.edu%2FxNF8yOV8zNjFfTWFoYWxhbm9iaXNfRGlzdGFuY2VfQmV5b25kX05vcGoTcswa634HYDAandusg=AFQjCNH_M3P-UpHrZxeixfwnBy3XgzqhiA. Accessed: [20 August 2015].

eThekwini Municipality. (2014) The Official Website of the eThekwini Municipality. [online], available: http://www.durban.gov.za/Pages/default.aspx [20 June 2014].

Ernst & Young. (2011) *The Digitalisation of everything how organisations must adapt to changing consumer behaviour*. [online], available: http://performance.ey.com/2012/06/06/the-digitalization-of-everything/ [24 December 2014].

Evans, N.D. (2003) *Business Innovation and Disruptive Technology Harnessing The Power Of Breakthrough Technology…For Competitive Advantage*, New Jersey: Pearson Prentice Hall.

Evans, P., and Wurster, T.S. (2000) *Blown to bits: How the new economics of information transforms strategy*. Harvard Business Press.

Farahani, R. and Hekmatfar, M. (2011) *Facility Location: Concepts, Models, Algorithms and Case Studies.* Germany: Springer Dordrecht

Fernandez, G. C. (2002) 'Discriminant Analysis: a powerful classification technique in data mining', in *Proceedings of the SAS Conference Proceedings*. pp. 247 – 256.

Fine, C.H., Vardan, R., Pethick, R and El-Hout, J. (2002) *Rapid-Response Capability in Value-Chain Design.* [online], available: http://sloanreview.mit.edu/article/rapidresponse-capability-in-valuechain-design/ [3 December 2014].

Fitzsimmons, J.A. and Fitzsimmons, M.J. (2008) *Service Management Operations, Strategy, Information Technology*. 6th ed. McGraw Hill International: Singapore.

Fleming, M. (2014) *What is 3D Printing?* [online], available: http://www.3dprinter.net/reference/what-is-3d-pprinting [2 December 2014].

Flurry, X. (2013) Flurry Five-Year Report: It's an App World. The World Just Lives in It. Blog posted by Simon Khalaf, 3 April 2013. [online], available: http://blog.flurry.com/bid/95723/Flurry-Five-Year-Report-It-s-an-App-World-The-Just-Web-Lives-in-It. [20 January 2015].

Fox, M. (2004) 'E-commerce business models for the music industry', *Popular Music and Society*, *27*(2): 201-220.

Frost, J. (2012) *Why You Need to Check Your Residual Plots for Regression Analysis*. [online], available: http://blog.minitab.com/blog/adventures-in-statistics/why-you-need-to-check-your-residual-plots-for-regression-analysis. Accessed: [20 August 2015].

Gallaugher, J.M. (2002) *E-commerce and the Undulating Distribution Channel.* [online], available: https://www2.bc.edu/~gallaugh/cacmundulating02.pdf [23 May 2014].

Garcia, R. and Calantone, R. (2002) *A critical look at technological innovation typology and innovativeness terminology: a literature review.* [online], available: http://www.sciencedirect.com/science/article/pii/S0737678201001321 [15 September 2014].

Garson, G.D. (2012) *Testing Statistical Assumptions.* USA: David Garson and Statistical Associates Publishing.

Giletti, T. (2012) *Why pay if it's free. Streaming, downloading and digital music consumption in the "iTunes era"*. [online], available: http://www.lse.ac.uk/media@lse/research/mediaWorkingPapers/MScDissertationSeries/2011/71.pdf [3 May 2014].

Given, L.M. (2008) 'The Sage Encyclopedia of Qualitative Research Methods', Sage: Thousand Oaks, CA Vol.2: 697 – 698.

Gordon, J. (2014) *Jack White's Lazaretto "Ultra LP" Contains Hologram in Vinyl, Tracks Hidden Under Labels, More Fun Stuff.* [online], available: http://pitchfork.com/news/55075-jack-whites-lazaretto-ultra-lp-contains-hologram-in-vinyl-tracks-hidden-under-labels-more-fun-stuff/ [20 August 2015].

Grabham, D. (2013) *DLNA: what it is and what you need to know*. [online], available: http://www.techradar.com/news/digital-home/home-networking/dlna-what-it-is-and-what-you-need-to-know/ [12 September 2014].

Graham, G., Burnes, B., Lewis, G.L., and Langer, J. (2004) 'The transformation of the music industry supply chain A major label perspective', *International Journal of Operations and Production Management*, 24(11): 1087 – 1103.

Greenburg, Z.O. (2012) 'Label Maker', *Forbes*, Entrepreneurs: 54-58.

Grow, K. (2014) *Hear James Murphy's US Open Remixes.* [online], available: http://www.rollingstone.com/music/news/hear-james-murphys-us-open-remixes-20140909 [10 September 2014].

Hatcher, L. (1994) *A step-by-step guide to using SPSS for Factor Analysis and Structural Equation Modelling*. USA: SAS Institute.

Heye, A. and Lamont, A. (2010) 'Mobile listening situations in everyday life: The use of MP3 players while travelling', *Musicae Scientiae*, 14(1): 95 – 120.

Hill, B. (2003) *The Digital Songstream Mastering the World of Digital Music*, Routledge: New York.

Hiscott, R. (2014) *Will 3D Printing Upend Fashion Like Napster Crippled The Music Industry*. [online], available: http://mashable.com/2014/03/03/3d-printing-fashion/ [2 December 2014].

Holt, R.D and Lewis, M.A. (2010) *Research Methods for Business: Central Tendency*. New York: Pearson Education Inc.

Hornor, S.H. (2008) *Diffusion of Innovation Theory*. [online], available: http://www.disciplewalk.com/files/Marianne_S_Hornor.pdf [19 June 2014].

Hracs, B.J. (2012) 'A Creative Industry in Transition: The Rise of Digitally Driven Independent Music Production', *Growth and Change*, 43(3): 442-461.

Hypergeo. (2004) *Spatial diffusion*. [online], available: http://www.hypergeo.eu/spip.php?article187 [22 June 2014].

Informa UK. (2010) *The international business newsletter of global music copyright*. [online], available: http://www.informatm.com/pdf/Nov-2006/10/m_c331_110806.pdf [3 May 2014].

International Federation of the Phonographic Industry (IFPI). (2014) *IFPI Digital Music Report 2014. Industry Report*, London: International Federation of the Phonographic Industry.

Jaakkola, H., Linna, P., Henno, J., Makela, J., and Welzer-Druzovec, T. (2012) 'A path towards networked organisations – the push of digital natives or the pull of the needs?', *Int. J. Knowledge Engineering and Soft Data Paradigms*, 3(4): 240-260.

Jin, B.H. and Li, Y.M. (2012) 'Analysis of emerging technology adoption for the digital content market', *Inf. Technology Management*, 13: 149-165.

Karlaftis, M., Washington, S. and Mannering, F. (2011) *Statistical and Econometric Methods for Transportation Data Analysis.* 2nd Edition. New York: Taylor and Francis Group

Karubian, S. (2009) '360 Degree Deals: An Industry Reaction To The Devaluation of Recorded Music', *Southern California Interdisciplinary Law Journal*, 18: 395-462.

Khambatti, M., Ryu, K., and Dasgupta, P. (2003) 'Push-Pull Gossiping for Information Sharing in Peer-to-peer Communities', *PDPTA*. 1393 – 1399.

Kinnear, T.C. and Taylor, J.R. (1991) *Marketing Research: An Applied Approach*. New York: McGraw-Hill.

Klym, N. (2005) *Digital Music Distribution*. [online], available: http://cfp.mit.edu/docs/digital-music-dec2005.pdf [11 August 2014].

Knopper, S. (2014) *Digital Music Takes a Dive as Record Sales Slip Again in 2013: Streaming services have picked up slack, but album sales in nearly all genres dipped last year*. [online], available: http://www.rollingstone.co.za/musicrev/item/3030-digital-music-takes-a-dive-as-record-sales-slip-again-in-2013 [24 October 2014].

Korb, K.A. (2012) *Conducting Educational Research Step 2: Identify Key Variables and Research Design*. [online], available: http://korbedpscych.com/R02Variables.html [26 March 2014].

Krause, A.E. and North, A.C. (2014) 'Music listening in everyday life: Devices, selection methods, and digital technology', Sage, 1 – 19. doi: 10.1177/0305735614559065.

Kruger, De Wit and Ramdass. (2007) *Operations Management*, 1st ed., Oxford University Press. Southern Africa.

Kumar, R. (2014) *Research Methodology: a step by step guide for beginners*. 4th ed. UK: Sage Publications.

Lam, C.K.M. and Tan, B.C.Y. (2001) 'THE INTERNET IS CHANGING THE MUSIC INDUSTRY', *Communications of the ACM*. 44(8): 63 – 68.

Laughlin, A. (2014) *What is DLNA?* [online], available: http://www.which.co.uk/reviews/televisions/article/advice/what-is-dlna [12 September 2014].

Leyshon, A. (2009) 'The software slump? Digital music, the democratisation of technology, and the decline of the recording studio sector within the musical economy', *Environment and Planning,* A 41: 1309-1337.

Longerneck, M. (2010) *An introduction to Statistical Methods and Data Analysis.* 2nd ed., USA: Cengage Learning.

Look & Listen. (2014) *Look & Listen is in Business Rescue.* [online], available: http://www.lookandlisten.co.za/ [16 June 2014].

Macedonia, M. (2000) *Distributed file sharing: barbarians at the gates?* [online], available: http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=863986 [13 September 2014].

Martin, B. and Davidson, L. (2014) *Apple shares climb a day after watch launched*. [online], available: http://www.telegraph.co.uk/finance/markets/11087260/Apple-shares-climb-a-day-after-watch-launched [12 September 2014].

Mathambo, S. and Rasethaba, L. (2014) *Future Sound of Mzansi*, [online], available: http://www.durbanfilmfest.co.za/2014/documentary-films/future-sounds-of-mzansi [16 September].

McCann, M. (2014) *NAP Africa celebrates a new peak at 15Gbps*. [online], available: http://www.teraco.co.za/news/current-news/napafrica-peaking-at-15gbps.html [12 September 2014].

McIntyre, A. (2009) *Diminishing varieties of active and creative retail experience: The end of the music shop?* [online], available: http://ac.els-cdn.com/S0969698909000575/1-s2.0-S0969698909000575-main.pdf?_tid=cc36b0b6-2869-11e4-81b100000aab0f6b&acdnat=1408539739_fc85a005d5abff7b55e4724c553da857 [13 March 2014].

McNabb, D.E. (2004) *Research Methods for Political Science: Quantitative and Qualitative Approaches.* 2nd ed. ME: Sharpe Publishers.

Messerschmitt, D. and Szyperski, C. (2003) *Software Ecosystem: Understanding an Indispensable Industry*, MIT Press: Cambridge.

Michaels, S. (2014) *James Murphy turns tennis into tunes with new algorithm project.* [online], available: http://www.theguardian.com/music/2014/aug/29/james-murphy-tennis-us-open-algorithm-project [10 September 2014].

Mittleman, D. (2010) *Adaption and Diffusion of Groupware*. [online], available: http://pm440.pbworks.com/w/page/26720451/Adoption%20and%20Diffusion%20 [26 June 2014].

Mkhize, T. (2008) *Piracy sinks local music sales*. [online], available: http://www.bizcommunity.com/Article/196/307/23334.html [21 August 2014].

Molitch-Hou, M. (2014) *How 3D Printing Change the World of Music.* [online], available: http://3dprintingindustry.com/2014/08/26/3d-printing-changes-world-music/ [17 September 2014].

Molteni, L. and Ordanini, A. (2003) 'Consumption patterns, digital technology and music downloading', *Long Range Planning*, 36: 389 – 406.

Montgomery, D. C., Peck, E. A. and Vining, G. G. (2001) *Introduction to Linear Regression Analysis*. 3rd Edition. New York: John Wiley and Sons

Mortimer, J.H., Nosko, C. and Sorensen, A (2012) *Supply responses to digital distribution: Recorded music and live performances*. [online], available: http://www.sciencedirect.com/science/article/pii/S016762451200008X [5 June 2014].

NAPAfrica. (2014) *NAP Africa*. [online], available: http://www.napafrica.net/ [7 December 2014].

Neumayr, T. (2014) *Apple to Acquire Beats Music and Beats Electronics*. [online], available: http://www.apple.com/pr/library/2014/05/28Apple-to-Acquire-Beats-Music-Beats-Electronics [12 September 2014].

Ng, T.W., and Chung, W. (2008) 'The Roles of Distributor in the Supply Chain – Push-pull Boundary', *International Journal of Business and Management*, 3(7): 28 – 39.

Nieman, G., Hough, J., and Nieuwenhuizen, C. (2009) *Entrepreneurship A South African Perspective*, 10th ed., Pretoria: Van Schaik Publishers.

NME. (2007) *Nine Inch Nails: "We're free agent.,"* [online], available: http://www.nme.com/news/nine-inch-nails/31657 [2 December 2014].

O'Neill, S. (2009) *Music enterprise and cultural entrepreneurship: How are independent music entrepreneurs adapting to working in the digital economy?* [online], available: http://www.slideshare.net/susioneill/digital-marketing-and-the-music-entrepreneur-2011 [5 March 2014].

Pallant, J. (2009) *SPSS Survival Manual: A step by step guide to data Analysis Using SPSS.* 2nd ed. Australia: Allan and Unwin.

Pallant, J. (2011) *SPSS Survival Manual: A step by step guide to data Analysis Using SPSS.* 4th ed. Australia: Allan and Unwin.

Panton, M. (2008) *DLNA for media streamers—what does it all mean?* [online], available: http://www.cnet.com/news/dlna-for-media-streamers-what-does-it-all-mean/ [12 September 2014].

Pasick, A. (2014) *U2's Apple deal shows why musicians don't sell music anymore*. [online], available: http://qz.com/262852/u2s-apple-deal-shows-why-musicians-dont-sell-music-anymore/ [12 September 2014].

Peoples, G. and Crupnick, R. (2014) *The True Story of How Vinyl Spun Its Way Back From Near-Extinction.* [online], available: http://www.billboard.com/articles/business/6406630/vinyl-records-comeback-music-industry-record-store-day [9 August 2015].

Picot, A. and Bortenlanger, C. (2006) 'An Organisation of Electronic Markets: Contributions from the New Institutional Economics', *The Information society*, 13(1): 107-123.

Pienaar, W.J. and Vogt, J.J. (2009) *Business Logistics Management*, 3rd ed., Oxford University Press. Southern Africa.

Pietila, T. (2009) 'WHOSE WORKS AND WHAT KINDS OF REWARDS The persisting question of ownership and control in the South African and global music industry,' *Information, Communication and Society*, 12(2): 229 – 250.

Punch, K. (2003) *Survey research: The Basics*. London: Sage Publishers.

Ramkissoon, N. (2012a) *South African music industry loving iTunes*. [online], available: http://www.timeslive.co.za/scitech/2012/12/10/south-african-music-industry-loving-itunes [14 June 2104].

Ramkissoon, N. (2012b) *Apple launches iTunes in South Africa*. [online], available: http://www.timeslive.co.za/entertainment/music/2012/12/04/apple-launches-itunes-store-in-south-africa [14 June 2014].

Rangaswamy, A. and Gupta, S. (1999) *Innovation Adoption and Diffusion in the Digital Environment: Some Research Opportunities*. [online], available: http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1008&context=thesesinfo [8 July 2014].

Rao, A. (2008) *Research Methodology for management and social sciences.* Excel books.

Rayna, T. and Striukova, L. (2010) *Monometapoly: Market Structure and Welfare of the Music Industry*. [online], available: http://www2.druid.dk/conferences/viewpaper.php?id=501781&cf=43 [2 December 2014].

Recording Industry of South Africa. (2014) *Recording Industry of South Africa*. [online], available: http://www.risa.org.za/ [16 June 2014].

Remenyi, D., Williams, B., Money, A., and Swart, E. (2010) *Doing Research in Business and Management: An Introduction to Process and Method*, Britain: SAGE Publications Ltd.

Research Methods Knowledge Base. (2014) *Likert Scales*. [online], available: http://www.researchproposalsforhealthprofessionals.com/likert_scale.htm [15 June 2014].

Rings, T. and Niewiem, S. (2014) *Why Manufacturing Will Resemble the Music Industry*. [online], available: http://www.businessweek.com/articles/2013-07-12/why-manufacturing-will-resemble-the-music-industry [18 August 2014].

Ross, M. (2014). *Inside Jack White's World's Fastest Record*. [online], available: http://www.rollingstone.com/music/news/inside-jack-whites-worlds-fastest-record-20140421 [24 October 2014].

Rossman, G. (2012) *CLIMBING THE CHARTS: WHAT RADIO AIRPLAY TELLS US ABOUT THE DIFFUSION OF INNOVATION*, Princeton University Press: New Jersey.

Roussel, P., Saad, K., and Erickson, T. (1991) *Third-Generation R and D: Managing the Link to Corporate Strategy*, Havard Business School Press: Boston.

Sarkar, M.B., Butler, B., and Steinfield, C. (2006) *Intermediaries and Cybermediaries: A Continuing Role for Mediating Players in the Electronic Marketplace*. [online],

available: http://onlinelibrary.wiley.com/doi/10.1111/j.1083-6101.1995.tb00167.x/full [2 December 2014].

Saunders, M., Lewis, P., and Thornhill, A. (2012) *RESEARCH METHODS FOR BUSINESS STUDENTS*. 6th ed. Pearson Education: London.

Schilling, M.A. (2010) *Strategic Management of Technological Innovation*, 3rd ed., New York University: McGraw-Hill Irwin.

Sekaran, U. (2003) *Research Methods for Business: A Skill Building Approach*, 4th ed., New Jersey: John Wiley and Sons.

Sekaran, U. and Bougie, R. (2010) *Research Methods for Business: A Skill Building Approach*, 5th ed., United Kingdom: John Wiley and Sons.

Seo, Y.J., Dinwoodie, J. and Kwak, D.W. (2014) *The impact of innovativeness on supply chain performance: Is supply chain integration a missing link?* [online], available: http://www.emeraldinsight.com/doi/pdfplus/10.1108/SCM-02-2014-0058 [15 September 2014].

Shane, S.A. (2014) *Technology Strategy for Managers and Entrepreneurs*, 1st ed., Pearson New International Edition: Pearson Publishing.

Shapiro, C. and Varian, H. (1999) *Information Rules*. Boston: Havard Business School Press.

Shevel, A. (2014) *Music fades for Look & Listen*. [online], available: http://www.bdlive.co.za/businesstimes/2014/06/15/music-fades-for-look-listen [21 June 2014].

Sibanda, N. (2009) *Quantitative Research*. [online], available: http://victoria.ac.nz/postgradlife/downloads/quantitative%20seminar18Aug09.pdf [15 June 2014].

Simchi-Levi, D., Kaminsky, P. and Simchi-Levi, E. (2009) *Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies*, 3rd ed., New York: McGraw Hill.

Smirke, R. (2014) IFPI's '*Recording Industry in Numbers': U.S. at $4.4 Billion, Germany Overtakes U.K.* [online], available: http://www.billboard.com/biz/articles/news/global/6029448/ifpis-recording-industry-in-numbers-us-at-44-billion-germany [10 May 2104].

Soosay, C.A. and Hyland, P.W. (2004) *Driving innovation in logistics: case studies in distribution centres.* [online], available: http://www.sciencedirect.com/science/article/pii/S0737678201001321 [15 September 2014].

South African Broadcasting Corporation (SABC). (2014) *SABC*. [online], available: http://www.sabc.co.za/wps/portal/SABC/SABCFREQUENCYMAP [16 June 2014].

South African Music Performance Rights Association (SAMPRA). (2014). SAMPRA Homepage. [online], available: http://www.sampra.org.za/about [26 June 2014].

Statistics Columbia. (2012) *Model Diagnostics for Regression*. [online]. available: http://www.stat.columbia.edu/~martin/W2024/R7.pdf. Accessed: [20 August 2015].

Statistics South Africa. (2014) [online], available: http://beta2.statssa.gov.za/?page_id=1021&id=ethekwini-municipality [19 June 2014].

Steyn, M.M. (2005) *A Supply Chain Model for the South African Recording Industry*. [online], available: http://repository.up.ac.za/bitstream/handle/2263/28217/07back.pdf?sequence=8 [11 June 2014].

Stensrud, B. (2014) *Thoughts on the supply chain for Recorded Music*. [online], available: http://businessofclassicalmusic.blogspot.com/2008/12/thoughts-on-supply-chain-for-recorded.html [9 July 2014].

Stevenson, W.J. (2012) *Operations Management: Theory and Practice*, 11th ed., United Kingdom: McGraw-Hill Education.

Stoller N. (2014) '*Bad Neighbours',* [DVD] Universal Studios, Los Angeles, CA.

Suede. (2014). *#MyMusicMondays: The SAMA's Numbers Game – Part 2*. [online], available: http://www.rollingstone.co.za/opinion/item/2362-mymusicmondays-the-samas-numbers-game-part-2 [24 October 2014].

Sweeny, E. and Ryan, C. (2008) 'Exploring the Digital Supply Chain: Implications and Models for Online Software Distribution', *Supply Chain Innovations: People, Practice, and Performance, perspectives*, Proceedings of the 13th Annual Conference of the Logistics Research Network, 217 – 221. Liverpool, September 2008.

Tabachnick, B.G. and Fidell, L.S. (2007) *Using multivariate statistics*. Boston: Pearson International Edition.

Taylor, S. (2014) *Tangible Orchestra: What Happens When 3D Printing Meets Live Art and Music?* [online], available: http://3dprintingindustry.com/2014/05/09/3d-printing-meets-live-art-music-tangible-orchestra/ [18 August 2014].

Terry, L. (2009) *Snapshot: Entertainment Logistics.* [online], available: http://www.inboundlogistics.com/cms/article/snapshot-entertainment-logistics/ [11 February 2014].

Thomas, S. (2015) *50 of South Africa's top ecommerce sites* [online], available: http://ventureburn.com/2015/08/50-south-africas-top-ecommerce-sites/ [18 August 2015].

Tidd, J. and Bessant, J. (2009) *Managing Innovation: Integrating Technological, Market and Organisational Change*, 4th ed., West Sussex: John Wiley and Sons Ltd.

Urdan, T.C. (2005) *Statistics in Plain English*. 2nd ed. USA: Routledge.

USAID. (2011) *Supply Chain Integration: Seamlessly Linking the Pieces*. [online], available: http://deliver.jsi.com/dlvr_content/resources/allpubs/logisticsbriefs/SCIntSeamLinkPiec.pdf [2 December 2014].

van der Berg, R. (2014) *Microsoft unveils TV white-spaces trial*. [online], available: http://www.techcentral.co.za/microsoft-unveils-tv-white-spaces-trial/48948/ [12 September 2014].

Vermeulen, J. (2014) *Music sales tanking in South Africa*. [online], available: http://mybroadband.co.za/news/internet/104009-music-sales-tanking-in-sa.html [24 October 2014].

Waldner, F., Zsifkovits, M, Lauren, L., and Heidenberger, K. (2011) Cross-Industry Innovation: The Transfer of a Service-Based Business Model from the Video Game Industry to the Music Industry. In *Emerging Intelligent Data and Web Technologies (EIDWT)*, 2011 International Conference: 143 – 147, IEEE.

Waldfogel, J. (2012) 'Copyright Protection, Technological Change, and the Quality of New Products: Evidence from Recorded Music since Napster', *Journal of Law and Economics*, 55(4):.715-740.

Walliman, N. (2001) *Your Research Project*. London: Sage Publications.

Warr, R. and Goode, M.M H. (2011) *Is the music industry stuck between rock and a hard place? The role of the Internet and three possible scenarios*. [online], available: http://www.sciencedirect.com/science/article/pii/S0969698910001256# [8 June 2014].

Waxman, K. T. (2013) Financial and Business management for the Doctor of Nursing Practice. [e-book] New York: Springer Publishing Company, available: https://books.google.co.za/books?hl=en&lr=&id=mJ0VkZhb9vUC&oi=fnd&pg=PP2&dq=waxman+Financial+and+Business+management+2013&ots=VwztaV_lHW&sig=LUhEhHPVQnhD_5VvNsV8s4XGQvQ#v=onepage&q=waxman%20Financial%20and%20Business%20management%202013&f=false [20 August 2015].

Wegner, J. (2007) *Applied Business Statistics: Methods and Applications*, Cape Town: Juta and Co. Ltd.

Weinberg, T. (2010) *The New Community Rules: Marketing on The Social Web.* John Wiley and Sons, Hoboken: New Jersey.

Werfs, M. (2013) *Agile IT Department – Concepts, Frameworks, Feasibility (Part 1).* [online], available: http://thinkcreative30.wordpress.com/2013/03/01/agile-it-departments-concepts-frameworks-feasibility-part-1/ [3 December 2013].

Whinston, A.O.D., Stahl, D. and Choi, S. (1997) Economics of Electronic Commerce. MacMillan Publishing Company, 656.

Young, S. and Collins, S. (2010) 'A View from the Trenches of Music 2.0.', *Popular Music and Society*, 33(3): 339-355.

Zikmund, W.G., Babin, B.J., Carr, J.C., and Griffin, M. (2013) *Business Research Methods*. 9th ed. Canada: South-Western, Cengage Learning.

Zentner, A. (2008) 'Online sales, Internet use, file sharing, and the decline of retail music speciality stores', *Information Economics and Policy*, 20(2008), 288-300.

APPENDICES

APPENDIX A: The Digital Living Network Alliance (DLNA)

The information provided below was obtained from two sources. The first is the DLNA website and the second is Laughlin (2014).

Specifications and how DLNA works

The DLNA Certified Device Classes are separated as follows. This provides the reader with a holistic framework of how media streaming provides convenience for consumers:

- Home network devices

    - Digital Media Server (DMS): stores content and makes it available to networked digital media players (DMP) and digital media renderers (DMR). Examples include PCs and network-attached storage (NAS) devices.

    - Digital Media Player (DMP): finds content on DMS and provides playback and rendering capabilities. Examples include televisions, stereos and home theatres, wireless monitors and game consoles.

    - Digital Media Renderer (DMR): plays content as instructed by the digital media controller (DMC), which will find content from a DMS. Examples include televisions, audio/video receivers, video displays and remote speakers for music. It is possible for a single device to function as both a DMR (which receives "pushed" content from DMS) and DMP (which "pulls" content from DMS).

    - Digital Media Controller (DMC): finds content on DMS and instructs the DMR to play the content. The content does not stream from or through the DMC. Examples include Internet tablets, Wi-Fi enabled digital cameras and smartphones.

    - Digital Media Printer (DMPr): provides printing services to the DLNA home network. Generally, DMP and DMC with print capability can print to DMPr. Examples include networked photo printers and networked all-in-one printers.

- Mobile handheld devices

  Mobile Digital Media Server (M-DMS): stores content and makes it available to wired or wireless networked mobile digital media players (M-DMP) and DMPr. Examples include mobile phones and portable music players.

  Mobile Digital Media Providers (M-DMP): find and play content on a digital media server (DMS) or M-DMS. Examples include mobile phones and mobile media tablets designed for viewing multimedia content.

  Mobile Digital Media Uploader (M-DMU): sends or uploads content to a DMS or M-DMS. Examples include digital cameras and mobile phones.

  Mobile Digital Media Downloader (M-DMD): finds and stores (download) content from a DMS or M-DMS. Examples include portable music players and mobile phones.

  Mobile Digital Media Controller (M-DMC): finds content on a DMS or M-DMS and sends it to DMR. Examples include personal digital assistants (PDAs) and mobile phones.

- Home infrastructure devices

  - Mobile Network Connectivity Function (M-NCF): provides a bridge between mobile handheld device network connectivity and home network connectivity.

  - Media Interoperability Unit (MIU): provides content transformation between required media formats for home network and mobile handheld devices.

The above specifications use Digital Transmission Content Protection (DTCP-IP) as "link protection" for copyright protected commercial content between one device and another, thereby eliminating theft by hackers. Laughlin (2014:2) identifies two main types of DLNA products, DLNA servers (such as PCs or a networked storage device) and DLNA clients. One of each is needed to stream content using DLNA. A DLNA client is the device on which the content is viewed or played, and such products include most smart TVs, soundbars and digital radios. Advanced DLNA-enabled TVs are sold with bespoke PC software that once installed, allows one's PC to talk directly with the consumer's television.

Member Companies / Affiliates

As at February 2014 there were 17 promoter members and 215 contributing members of the DLNA. Most are consumer electronics manufacturers that have worked with the DLNA to

create standard-enabling DLNA devices to share media over a home network. The promoting members are:

- ACCESS
- Arris
- Awox
- Broadcom
- CableLabs
- Comcast
- Dolby Laboratories
- DTS
- Intel
- LG Electronics
- Microsoft
- Nokia
- Panasonic
- Samsung Electronics
- Sony Electronics
- Time Warner Cable
- Verizon

Products supporting DLNA

DLNA certified devices – there are over 9 000 products on the market that are DLNA certified. These include TVs, DVDs, and Blu-ray players, game consoles, digital media players, photo frames, cameras, NAS devices, PCs, and mobile handsets. Today, it is easy for consumers to purchase products that are DLNA certified by identifying the logo on the device or by verification of a DLNA product search.

DLNA technology components – software vendors are allowed to claim their software is a DLNA Technology Component if the software has undergone certification testing on a device and the device has been classified as DLNA Certification. DLNA technology components are not marketed to the consumer but through the industry. Alves (2004:130) noted that technology not only impacts on customers, but technology is also shaped by consumer adoption and modification. DLNA interoperability guidelines enable manufacturers to participate in the

growing environment of networked devices and are separated into the following key technology components:

- Network and connectivity
- Device and service discovery and control
- Media format and transport model
- Media management, distribution and control
- Digital rights management and content protection; and
- Manageability.

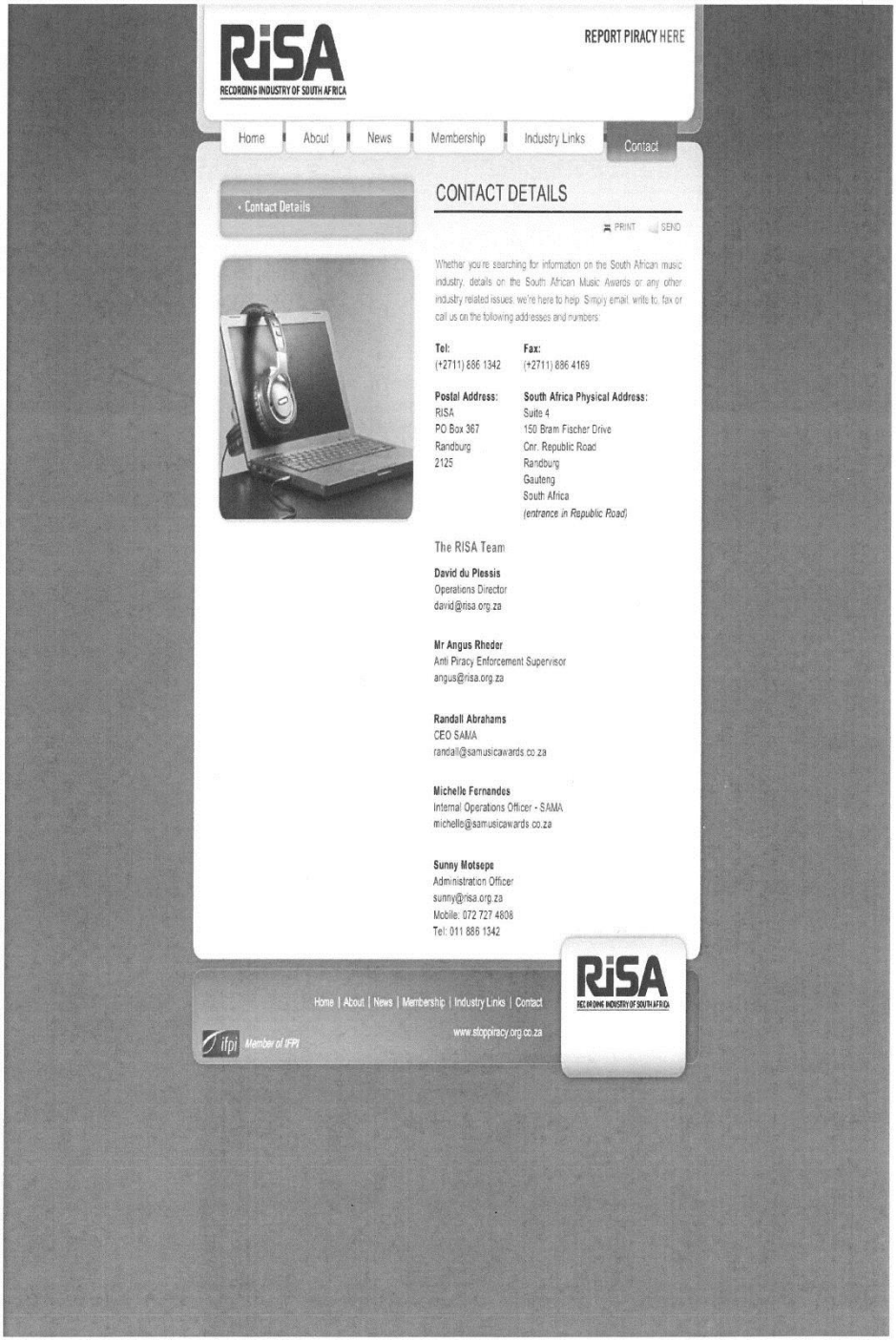
Figure: A1 DLNA Premium content devices act as hubs, streaming protects content to existing non-certified appliances

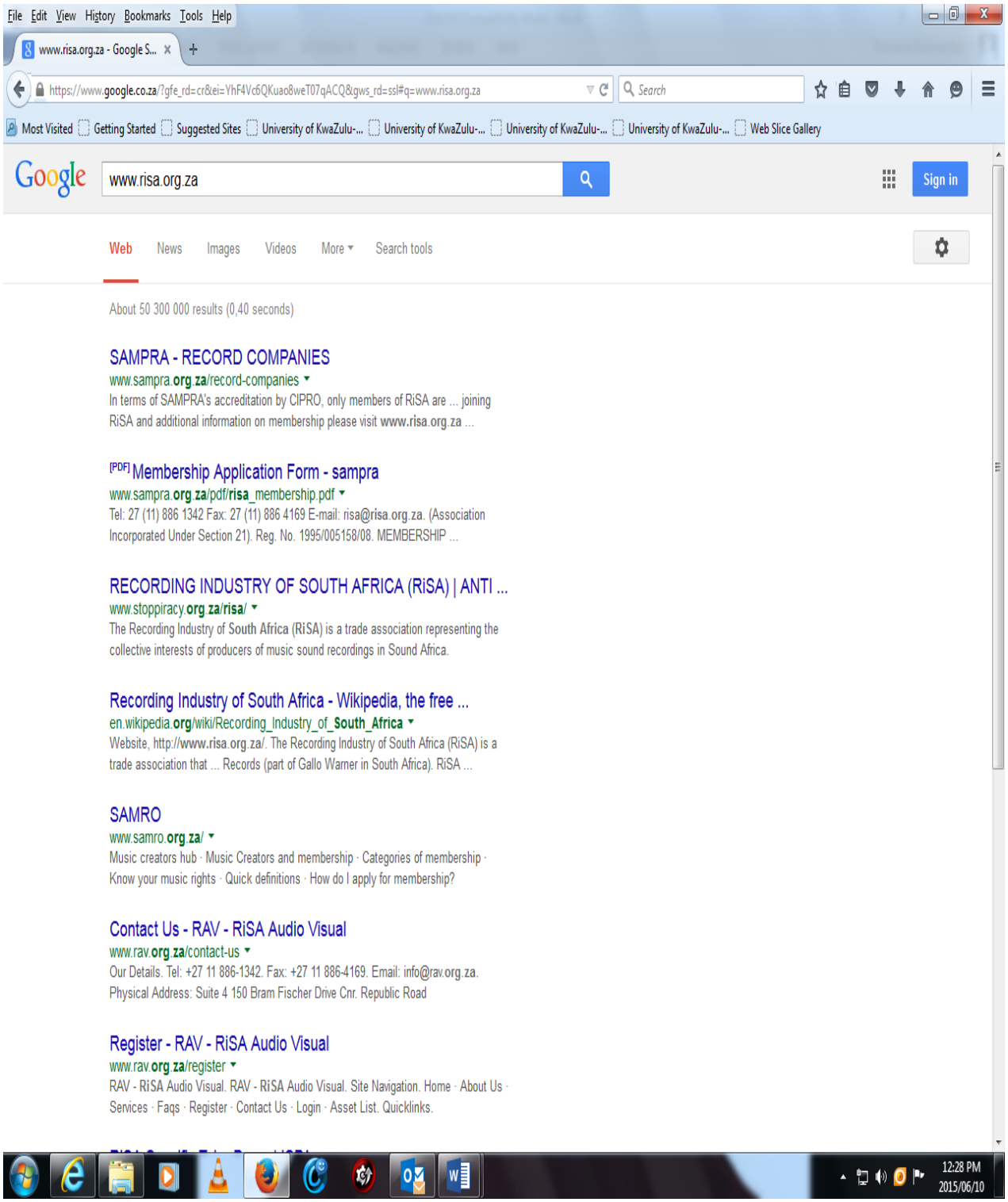
Source: Grabham, D. (2013) *DLNA: what it is and what you need to know*. [online], available: http://www.techradar.com/news/digital-home/home-networking/dlna-what-it-is-and-what-you-need-to-know/ [12 September 2014]: P. 3.

DLNA certified software – in 2005 the DLNA introduced a Software Certification programme to make it easier for consumers to share their digital media across a broader range of products. The organisation certifies software that is sold directly to consumers through retailers, websites and mobile application stores. Consumers can now upgrade products from within their home

networks. This assists in introducing content such as videos, photos and music stored on DLNA certified devices to a larger selection of consumer electronics, mobiles and PC products.

APPENDIX B: Screenshot of the RiSA website being Active then Inactive or offline




File Edit View History Bookmarks Tools Help
www.risa.org.za - Google S...
https://www.google.co.za/?gfe_rd=cr&ei=YhF4Vc6QKuao8weT07qACQ&gws_rd=ssl#q=www.risa.org.za
Search
Most Visited
Getting Started
Suggested Sites
University of KwaZulu-...
University of KwaZulu-...
University of KwaZulu-...
University of KwaZulu-...
Web Slice Gallery
Google
www.risa.org.za
Sign in
Web
News
Images
Videos
More
Search tools
About 50 300 000 results (0,40 seconds)
SAMPRA - RECORD COMPANIES
www.sampra.org.za/record-companies
In terms of SAMPRA's accreditation by CIPRO, only members of RiSA are ... joining RiSA and additional information on membership please visit www.risa.org.za ...
[PDF] Membership Application Form - sampra
www.sampra.org.za/pdf/risa_membership.pdf
Tel: 27 (11) 886 1342 Fax: 27 (11) 886 4169 E-mail: risa@risa.org.za. (Association Incorporated Under Section 21). Reg. No. 1995/005158/08. MEMBERSHIP ...
RECORDING INDUSTRY OF SOUTH AFRICA (RiSA) | ANTI ...
www.stoppiracy.org.za/risa/
The Recording Industry of South Africa (RiSA) is a trade association representing the collective interests of producers of music sound recordings in Sound Africa.
Recording Industry of South Africa - Wikipedia, the free ...
en.wikipedia.org/wiki/Recording_Industry_of_South_Africa
Website, http://www.risa.org.za/. The Recording Industry of South Africa (RiSA) is a trade association that ... Records (part of Gallo Warner in South Africa). RiSA ...
SAMRO
www.samro.org.za/
Music creators hub · Music Creators and membership · Categories of membership · Know your music rights · Quick definitions · How do I apply for membership?
Contact Us - RAV - RiSA Audio Visual
www.rav.org.za/contact-us
Our Details. Tel: +27 11 886-1342. Fax: +27 11 886-4169. Email: info@rav.org.za. Physical Address: Suite 4 150 Bram Fischer Drive Cnr. Republic Road
Register - RAV - RiSA Audio Visual
www.rav.org.za/register
RAV - RiSA Audio Visual. RAV - RiSA Audio Visual. Site Navigation. Home · About Us · Services · Faqs · Register · Contact Us · Login · Asset List. Quicklinks.
12:28 PM
2015/06/10

APPENDIX C: Research Questionnaire

School of Management, Information Technology and Governance

Voluntary Questionnaire

Master's Research Project

Researcher: Praveena Ramnandan (082 354 6250) Email: ramnandanp@ukzn.ac.za

Supervisor: Dr T.P Mbhele (031-2607524) Email: mbhelet@ukzn.ac.za

Research Officer: Ms. P. Ximba 031-2603587 Email: ximbap@ukzn.ac.za

Title: The digital supply chain distribution of music in the South African Recording Industry: Durban Region

The purpose of this questionnaire is to generate information from musicians in Durban regarding the digital supply chain distribution of music in the South African Recording Industry. The information that is provided by you is strictly private and confidential to the researcher. The questionnaire will take approximately 8-10 minutes to complete.

Thank you for participating!!!

CONSENT

I ***(Optional)*** _____ (full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that I am at liberty to withdraw from the project at any time, should I so desire.

_____ _____

Signature of Participant Date

This page is to be retained by the researcher.

Questionnaire

Section A: Bibliographic Data and Artist Profile

The following section relates to the **biographical details** of the respondent. All answers you provide are based on your experience, perceptions and knowledge. **Please tick (√) or encircle the appropriate box.**

1. Age:

18 to 25 years		26 to 35 years		36 to 45 years		46 years and older	

2. Gender:

Male		Female	

3. Race:

African		Indian		White		Coloured		Asian		Other	

4. Educational Qualifications:

High School		Matric		Bachelor Degree		Honours		Masters		PhD		Other	

5. Artist Category:

Belong to a Label		Independent artist		Social entrepreneur		Other, please specify	

6. Number of years in the music industry:

Less than a year		1 to 3 years		4 to 6 years		7 to 10 years		Over 10 years	

7. My music is distributed by:

Myself		My Label	

8. The music is distribute using:

Electronic distribution		Traditional means (music stores)		Both	

9. The following websites are used to distribute my music:

iTunes		Social Media sites		SAmp3.com		Napster		Soundcloud		Other, please specify	

10. The music is aligned with the following categories:

Customer demands		Label demands		My own artistic taste	

Section B:

This section aims to obtain information on dichotomous questions (Yes or No) with regards to the general perceptions of artists. Please tick (√) or encircle the appropriate response
(Yes or No)

Push – pull strategies used by artists		
11. Live music performances are used as a promotional activity.	Yes	No
12. Social networking mediums increase the market base on music distribution.	Yes	No
13. Retail music store/s facilitates easy access to music distribution.	Yes	No
14. Online retail music store/s better facilitate access to music distribution.	Yes	No
15. Digital music distribution inspires innovation to the musician.	Yes	No
16. The availability of online music attracts a wider audience.	Yes	No

Section C: The following questions are based on a Likert scale ranging from
1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree.
Please tick (√) or encircle the appropriate box.

Music Distribution	**SA**	**A**	**N**	**D**	**SD**
17. The digital distribution of music has added value in the growth of the South African recording industry.	5	4	3	2	1
18. The Internet has advanced the methods of distributing the music.	5	4	3	2	1
19. The Internet has taken over the role of record labels in the managing of musicians.	5	4	3	2	1
20. The Internet has contributed to the mass consumption on music online.	5	4	3	2	1
21. The Internet has reduced the number of physical music retail stores.	5	4	3	2	1
22. The Internet plays a role in both the creation and promotion of music entrepreneurs.	5	4	3	2	1

23.	There is a distinct value between traditional music distribution and digital music distribution.	5	4	3	2	1
	Technological Value adding innovations – Supply and Demand	**SA**	**A**	**N**	**D**	**SD**
24.	Digital music distribution methods have transformed the consumption of music.	5	4	3	2	1
25.	In my opinion free online music leads to further music consumption.	5	4	3	2	1
26.	The current copyright laws provide adequate protection for artists' music rights.	5	4	3	2	1
27.	Complementary technology adoption influences customers to listen to more online music.	5	4	3	2	1
28.	Music downloads are influenced by modular technological developments, such as smartphones.	5	4	3	2	1
29.	Regulation and closure of various digital distribution services will reduce the illegal downloading of music.	5	4	3	2	1
30.	Access to high bandwidth speeds influences online downloads.	5	4	3	2	1
31.	Access to technological compatible media devices influences online downloads.	5	4	3	2	1
32.	Advancements in technology encourage independent music production	5	4	3	2	1
	Supply Chain Competence and Capability	**SA**	**A**	**N**	**D**	**SD**
33.	The introduction of innovated products (such as iPods) or services (iTunes) adds value to music.	5	4	3	2	1
34.	Music tracks can be re-mixed and uploaded in a shorter period than the CD era.	5	4	3	2	1
35.	Digitalisation of music enables quick / swift response to changing demands.	5	4	3	2	1
36.	The Internet is reliable in the delivery of both music products and services.	5	4	3	2	1
37.	Technological advancements have facilitated the evolution of digital music.	5	4	3	2	1
38.	The Internet is the most effective way to continuously provide updated or new music offerings to the consumer.	5	4	3	2	1

Thank you for participating!!!

APPENDIX D: Frequency Distribution and Raw Data on Statistics

Frequency Distribution

Section A: Biographical Data

Table 4: Composition of Biographical Sample

Biographical Variables		**Frequency**	**Percentage**
4.1 Age	18 – 25 years	144	66.4
	26 – 35 years	51	23.5
	36 – 45 years	16	7.4
	46 years and older	6	2.8
	Total	**217**	**100.0**
4.2 Gender	Male	106	48.8
	Female	111	51.2
	Total	**217**	**100.0**
4.3 Race	African	135	62.2
	Indian	46	21.2
	White	19	8.8
	Coloured	14	6.5
	Other	3	1.4
	Total	**217**	**100.0**
4.4 Education	High School	11	5.1
	Matric	84	38.7
	Bachelor Degree	90	41.5
	Honours	19	8.8
	Masters	6	2.8
	PhD	2	.9
	Other	5	2.3
	Total	**217**	**100.0**
4.5 Artist Category	Belong to a label	58	26.7
	Independent artist	119	54.8
	Social music entrepreneur	38	17.5
	Other	2	.9
	Total	**217**	**100.0**
4.6 Number of years in the music industry	Less than a year	61	28.1
	1 – 3 years	99	45.6
	4 – 6 years	34	15.7
	7 – 10 years	11	5.1

	Over 10 years	12	5.5
	Total	**217**	**100.0**
4.7 Music is distributed by	Myself	151	69.6
	My Label	66	60.4
	Total	**217**	**100.0**
4.8 Medium of Distribution	Electronic distribution	105	48.4
	Traditional means	38	17.5
	Both	74	34.1
	Total	**217**	**100.0**
4.9 Websites used to distribute music	iTunes	41	18.9
	Social Media Websites	113	52.1
	SAmp3.com	36	16.6
	Napster	11	5.1
	Soundcloud	47	21.7
	Other	14	6.5
	Total	**262**	**120.9**
4.10 Music is aligned with	Customer demands	58	26.7
	Label demands	42	19.4
	My own artistic taste	117	53.9
	Total	**217**	**100.0**

Section B: Dichotomous Questions

4.11 Frequency Distribution – Questions 11 to 16

Live music performances are used as a promotional activity

		Frequency	Percent (%)
Valid	Yes	210	96.8
	No	7	3.2
	Total	217	100.0

Social networking mediums increase the market base on music distribution

		Frequency	Percent (%)
Valid	Yes	196	90.3
	No	21	9.7
	Total	217	100.0

Retail music store/s better facilitate access to music distribution

		Frequency	Percent (%)
Valid	Yes	122	56.2
	No	95	43.8
	Total	217	100.0

Online retail music store/s better facilitate access to music distribution

		Frequency	Percent (%)
Valid	Yes	180	82.9
	No	37	17.1
	Total	217	100.0

Digital music distribution inspires innovation to the musician

		Frequency	Percent (%)
Valid	Yes	190	87.6
	No	27	12.4
	Total	217	100.0

The availability of online music attracts a wider audience

		Frequency	Percent (%)
Valid	Yes	195	89.9
	No	22	10.1
	Total	217	100.0

Binomial Test on Questions 11 to 16

		Category	N	Observed Prop.	Test Prop.	Asymp. Sig. (2-tailed)
Live music performances are used as a promotional activity.	Group 1	Yes	210	.97	.50	.000[a]
	Group 2	No	7	.03		
	Total		217	1.00		
Social networking mediums increase the market base on music distribution.	Group 1	Yes	196	.90	.50	.000[a]
	Group 2	No	21	.10		
	Total		217	1.00		
Retail music store/s facilitates easy access to music distribution.	Group 1	No	95	.44	.50	.077[a]
	Group 2	Yes	122	.56		
	Total		217	1.00		
Online retail music store/s better facilitate access to music distribution.	Group 1	Yes	180	.83	.50	.000[a]
	Group 2	No	37	.17		
	Total		217	1.00		
Digital music distribution inspires innovation to the musician.	Group 1	Yes	190	.88	.50	.000[a]
	Group 2	No	27	.12		
	Total		217	1.00		
The availability of online music attracts a wider audience.	Group 1	Yes	195	.90	.50	.000[a]
	Group 2	No	22	.10		
	Total		217	1.00		

a. Based on Z Approximation.

Section C: Likert Scale

4.12 Frequency Distribution – Questions 17 to 23

The digital distribution of music has added value in the growth of the South African recording industry.

Question 17		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	1.4	1.4	1.4
	Disagree	10	4.6	4.6	6.0
	Neutral	35	16.1	16.1	22.1
	Agree	95	43.8	43.8	65.9
	Strongly Agree	74	34.1	34.1	100.0
	Total	217	100.0	100.0	

The Internet has advanced the methods of distributing the music.

Question 18		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	1.8	1.8	1.8
	Disagree	2	.9	.9	2.8
	Neutral	26	12.0	12.0	14.7
	Agree	88	40.6	40.6	55.3
	Strongly Agree	97	44.7	44.7	100.0
	Total	217	100.0	100.0	

The Internet has taken over the role of record labels in the managing of musicians.

Question 19		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	1.4	1.4	1.4
	Disagree	17	7.8	7.8	9.2
	Neutral	64	29.5	29.5	38.7
	Agree	80	36.9	36.9	75.6
	Strongly Agree	53	24.4	24.4	100.0
	Total	217	100.0	100.0	

The Internet has contributed to the mass consumption on music online.

	Question 20	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	.9	.9	.9
	Disagree	10	4.6	4.6	5.5
	Neutral	37	17.1	17.1	22.6
	Agree	91	41.9	41.9	64.5
	Strongly Agree	77	35.5	35.5	100.0
	Total	217	100.0	100.0	

The Internet has reduced the number of physical music retail stores.

	Question 21	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	.9	.9	.9
	Disagree	10	4.6	4.6	5.5
	Neutral	49	22.6	22.6	28.1
	Agree	92	42.4	42.4	70.5
	Strongly Agree	64	29.5	29.5	100.0
	Total	217	100.0	100.0	

The Internet plays a role in both the creation and promotion of music entrepreneurs.

	Question 22	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	.9	.9	.9
	Disagree	11	5.1	5.1	6.0
	Neutral	40	18.4	18.4	24.4
	Agree	97	44.7	44.7	69.1
	Strongly Agree	67	30.9	30.9	100.0
	Total	217	100.0	100.0	

There is a distinct value between traditional music distribution and digital music distribution.

Question 23		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	.9	.9	.9
	Disagree	12	5.5	5.5	6.5
	Neutral	69	31.8	31.8	38.2
	Agree	82	37.8	37.8	76.0
	Strongly Agree	52	24.0	24.0	100.0
	Total	217	100.0	100.0	

4.13 Frequency Distribution – Questions 24 to 32

Digital music distribution methods have transformed the consumption of music.

Question 24		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.5	.5	.5
	Disagree	11	5.1	5.1	5.5
	Neutral	38	17.5	17.5	23.0
	Agree	100	46.1	46.1	69.1
	Strongly Agree	67	30.9	30.9	100.0
	Total	217	100.0	100.0	

In my opinion free online music leads to further music consumption.

Question 25		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	1.4	1.4	1.4
	Disagree	10	4.6	4.6	6.0
	Neutral	32	14.7	14.7	20.7
	Agree	92	42.4	42.4	63.1
	Strongly Agree	80	36.9	36.9	100.0
	Total	217	100.0	100.0	

The current copyright laws provide adequate protection for artists' music rights.

Question 26		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	24	11.1	11.1	11.1
	Disagree	40	18.4	18.4	29.5
	Neutral	44	20.3	20.3	49.8
	Agree	61	28.1	28.1	77.9
	Strongly Agree	48	22.1	22.1	100.0
	Total	217	100.0	100.0	

Complementary technology adoption influences customers to listen to more online music.

Question 27		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	4	1.8	1.8	1.8
	Neutral	40	18.4	18.4	20.3
	Agree	116	53.5	53.5	73.7
	Strongly Agree	57	26.3	26.3	100.0
	Total	217	100.0	100.0	

Music downloads are influenced by modular technological developments, such as smartphones

Question 28		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	.9	.9	.9
	Disagree	14	6.5	6.5	7.4
	Neutral	30	13.8	13.8	21.2
	Agree	90	41.5	41.5	62.7
	Strongly Agree	81	37.3	37.3	100.0
	Total	217	100.0	100.0	

Regulation and closure of various digital distribution services will reduce the illegal downloading of music.

Question 29		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	1.8	1.8	1.8
	Disagree	19	8.8	8.8	10.6
	Neutral	62	28.6	28.6	39.2
	Agree	89	41.0	41.0	80.2
	Strongly Agree	43	19.8	19.8	100.0
	Total	217	100.0	100.0	

Access to high bandwidth speeds influences online downloads.

Question 30		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.5	.5	.5
	Disagree	16	7.4	7.4	7.8
	Neutral	55	25.3	25.3	33.2
	Agree	98	45.2	45.2	78.3
	Strongly Agree	47	21.7	21.7	100.0
	Total	217	100.0	100.0	

Access to technological compatible media devices influences online downloads.

Question 31		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.5	.5	.5
	Disagree	13	6.0	6.0	6.5
	Neutral	37	17.1	17.1	23.5
	Agree	107	49.3	49.3	72.8
	Strongly Agree	59	27.2	27.2	100.0
	Total	217	100.0	100.0	

Advancements in technology encourage independent music production

Question 32		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.5	.5	.5
	Disagree	15	6.9	6.9	7.4
	Neutral	40	18.4	18.4	25.8
	Agree	74	34.1	34.1	59.9
	Strongly Agree	87	40.1	40.1	100.0
	Total	217	100.0	100.0	

4.14 Frequency Distribution – Questions 33 to 38

The introduction of innovated products (such as iPods) or services (iTunes) adds value to music

Question 33		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	2.8	2.8	2.8
	Disagree	6	2.8	2.8	5.5
	Neutral	36	16.6	16.6	22.1
	Agree	83	38.2	38.2	60.4
	Strongly Agree	86	39.6	39.6	100.0
	Total	217	100.0	100.0	

Music tracks can be remixed and uploaded in a shorter period than the CD era.

Question 34		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.5	.5	.5
	Disagree	5	2.3	2.3	2.8
	Neutral	29	13.4	13.4	16.1
	Agree	96	44.2	44.2	60.4
	Strongly Agree	86	39.6	39.6	100.0
	Total	217	100.0	100.0	

Digitalisation of music enables quick / swift response to changing demands.

Question 35		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	8	3.7	3.7	3.7
	Neutral	52	24.0	24.0	27.6
	Agree	100	46.1	46.1	73.7
	Strongly Agree	57	26.3	26.3	100.0
	Total	217	100.0	100.0	

The Internet is reliable in the delivery of both music products and services.

Question 36		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	1.8	1.8	1.8
	Disagree	17	7.8	7.8	9.7
	Neutral	43	19.8	19.8	29.5
	Agree	94	43.3	43.3	72.8
	Strongly Agree	59	27.2	27.2	100.0
	Total	217	100.0	100.0	

Technological advancements have facilitated the evolution of digital music.

Question 37		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	13	6.0	6.0	6.0
	Neutral	40	18.4	18.4	24.4
	Agree	99	45.6	45.6	70.0
	Strongly Agree	65	30.0	30.0	100.0
	Total	217	100.0	100.0	

The Internet is the most effective way to continuously provide updated or new music offerings to the consumer.

Question 38		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	1.8	1.8	1.8
	Disagree	13	6.0	6.0	7.8
	Neutral	29	13.4	13.4	21.2
	Agree	80	36.9	36.9	58.1
	Strongly Agree	91	41.9	41.9	100.0
	Total	217	100.0	100.0	

Raw Data on Statistics

One Sample Test – Questions 18 to 23: Music Distribution

	N	Mean	Std. Deviation	Std. Error Mean
The Internet has advanced the methods of distributing the music.	217	4.25	.842	.057
The Internet has taken over the role of record labels in the managing of musicians.	217	3.75	.959	.065
The Internet has contributed to the mass consumption on music online.	217	4.06	.890	.060
The Internet has reduced the number of physical music retail stores.	217	3.95	.888	.060
The Internet plays a role in both the creation and promotion of music entrepreneurs.	217	4.00	.885	.060
There is a distinct value between traditional music distribution and digital music distribution.	217	3.78	.905	.061

One-Sample Statistics - Questions 24 to 32: Supply and Demand

	Test Value = 3					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Digital music distribution methods have transformed the consumption of music.	17.545	216	.000	1.018	.90	1.13
In my opinion free online music leads to further music consumption.	17.681	216	.000	1.088	.97	1.21
The current copyright laws provide adequate protection for artists' music rights.	3.593	216	.000	.318	.14	.49
Complementary technology adoption influences customers to listen to more online music.	21.246	216	.000	1.041	.94	1.14
Music downloads are influenced by modular technological developments, such as smartphones.	17.226	216	.000	1.078	.95	1.20
Regulation and closure of various digital distribution services will reduce the illegal downloading of music.	10.572	216	.000	.682	.55	.81
Access to high bandwidth speeds influences online downloads.	13.454	216	.000	.802	.68	.92
Access to technological compatible media devices influences online downloads.	16.733	216	.000	.968	.85	1.08
Advancements in technology encourage independent music production	16.500	216	.000	1.065	.94	1.19

One-Sample Test – Questions 33 to 38: Supply Chain Competence and Capability

	N	Mean	Std. Deviation	Std. Error Mean
The introduction of innovated products (such as iPods) or services (iTunes) adds value to music.	217	4.09	.958	.065
Music tracks can be re-mixed and uploaded in a shorter period than the CD era.	217	4.20	.791	.054
Digitalisation of music enables quick / swift response to changing demands.	217	3.95	.806	.055
The Internet is reliable in the delivery of both music products and services.	217	3.86	.967	.066
Technological advancements have facilitated the evolution of digital music.	217	4.00	.853	.058
The Internet is the most effective way to continuously provide updated or new music offerings to the consumer.	217	4.11	.975	.066

APPENDIX E: Letter from the Editor

62 Ferguson Road
Glenwood
DURBAN 4001
Tel: 072 442 7896
Email: deanne.collins30@gmail.com
Income tax number: 0526066204

11 November 2015

This is to confirm that I have edited the dissertation, "Digital supply chain distribution of music in the South African Recording Industry: Durban Region" by Praveena Ramnandan, student number 961111758.

Yours sincerely,

D Collins

(Ms) Deanne Collins (MA)

Professional Editor

APPENDIX F: Ethical Clearance Form

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

14 October 2014

Ms Praveena Ramnandan (961111758)
School of Management, IT & Governance
Westville Campus

Protocol reference number: HSS/1352/014M
Project title: Digital supply chain distribution of music in the South African Recording Industry: Durban region

Dear Ms Ramnandan,

Full Approval – Expedited Application

In response to your application received on 08 October 2014, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol have been granted **FULL APPROVAL.**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

.....
Dr Shenuka Singh (Chair)

/ms

Cc Supervisor: Dr TP Mbhele
Cc Academic Leader Research: Professor Brian McArthur
Cc School Administrator: Ms Angela Pearce

Humanities & Social Sciences Research Ethics Committee
Dr Shenuka Singh (Chair)
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Telephone: +27 (0) 31 260 3587/8350/4557 **Facsimile**: +27 (0) 31 260 4609 **Email:** ximbap@ukzn.ac.za / snymanm@ukzn.ac.za / mohunp@ukzn.ac.za
Website: www.ukzn.ac.za