

The Move to Artist-Led On-Line Music Distribution: A Theory-Based Assessment and Prospects for Structural Changes in the Digital Music Market

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ABSTRACT: New forms of digital distribution are dramatically transforming market structures in the recorded music industry value chain. We propose a model and theoretical perspective that take account both of the music industry's traditional value chain and distribution network, and the product characteristics of digital music as related to consumer value creation. The model highlights changes in the market structure from the perspective of the players in the music industry value chain. Utilizing a series of propositions, we characterize the forces at work in the market transformation and show how each player's role in the industry value chain is likely to change. We also examine the effects of market structure changes on intellectual property rights issues. Finally, we present a series of mini-cases that provide evidence in support of the proposed theoretical perspective.

KEY WORDS AND PHRASES: Digital goods, digital music, e-commerce, intermediation, market structure, MP3s, music distribution, music industry, on-line music, property rights, value chains.

In recent years, the music industry has experienced dramatic shocks that will ultimately transform its structure. The transformation has been sparked by new technologies and Internet use for the distribution of music as a digital information good. The MP3 audio format and the wide distribution network that have become available via the Internet are driving changes in the recorded music market structure and simultaneously are having a significant impact on the players in the traditional recorded music value chain. This article discusses the theoretical basis for assessing the current market structure, analyzes the factors responsible for shaping the new marketplace, and evaluates

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the changing stakeholder roles in the value chain in the move to distribution of digital music. It also discusses intellectual property rights issues that have arisen around these changes, and evaluates the prospects for future changes in the digital music market.

Background History of Music Distribution and Pricing

Historically, musical artists have needed the support of a record label to produce, promote, and distribute music. Artists signed exclusive contracts with record labels allowing the labels to essentially act as monopolies for their artists' content. The labels were able to set royalty fees and subsequent retail-price levels consistent with the consumer's willingness to pay and not necessarily based on the quality of music. This resulted in consistent pricing strategies across labels and releases, reflecting the fact that the labels, because of their monopoly power, did not need to employ discriminatory pricing policies. Although some price dispersion is apparent in music pricing across artists and releases, the pricing mechanism is based on history, not on competition.

In the 1950s and 1960s, the dominant medium for recorded music distribution was the 45-rpm single, which was priced to be affordable for the mass teenage consumer population. Record labels still released full-length albums, but the production focus—and the majority of sales—was the single. In the mid-1960s, music distributed as albums (LPs) became increasingly popular, and record labels began creating music bundles that appealed to a more devoted fan willing to pay a higher price for additional content. Again, the pricing mechanism for full-length albums stayed relatively consistent across labels and artists regardless of popularity or quality of music. Not every recorded-music release results in profits for the music label or the artist. Many releases do not recoup their up-front production cost, and in the absence of discriminatory pricing based on popularity, record labels must rely on the success of a few albums and singles to make up for the losses incurred by a majority of unpopular releases. This pricing strategy is similar to the movie industry's, in which ticket prices are consistent across releases and production companies must rely on the box office sales of a few successful motion pictures to turn a profit.

The digital music industry has followed suit by maintaining consistent pricing mechanisms regardless of song and album quality and popularity. Thus the strong historical and legacy pricing mechanisms of the music industry have affected the pricing strategies employed by new digital music retailers. One may further note that the pricing of digital music on-line is quite different from the pricing of electronics or other information goods on-line.¹

The Growth of Digital Music

With the advent of digitization and the Internet, the music industry has experienced major changes in the past decade. United States retail sales of recorded music dropped from \$13 billion in 1999 to \$10.6 billion in 2003 [44], while the

popularity of digital music grew. One year later, in 2004, recorded-music sales were up 1.4 percent in the United States, and the industry's revenues had stabilized globally, according to a United Kingdom-based industry analyst, Claire Enders. However, the longer-run prediction is for further declines in revenues.² Apple iTunes' customer base expanded from 861,000 in July 2003 to 4.9 million in March 2004 [8], reflecting digital music's new role as a "strategic necessity" of the music industry. Analysts predict that within five years 20 percent to 33 percent of all music sales will shift from CDs to digital distribution [44].

New devices that play digital audio formats, such as the Apple iPod and the Dell JukeBox, are increasing in popularity and driving demand for digitally formatted music. Apple has sold millions of iPods and is offering multiple versions of the player to gain larger market share. In addition, Apple announced in July 2005 that its on-line digital download service, iTunes, had sold more than 500 million digital music files [2]. The digital music format is quite clearly here to stay and, indeed, is fast becoming the preferred product choice for many music consumers.

Current Digital Music Pricing

An empirical regularity of the digital music marketplace, based on sample data on firm approaches to song and album pricing, is that pricing structures are similar industry-wide. Table 1 reveals the consistent prices for digital music observed in April 2005.

There are two basic pricing strategies for digital music: song-based purchase pricing and subscription services. The *de facto* standard price is currently 99¢ per song in the United States, or about \$10 per album, versus \$10 to \$15 per month for a subscription digital audio service. The market is in the early stages of development, and prices may be set to encourage growth and adoption as companies in the industry try to position themselves for long-run profit maximization. The 99¢ per song pricing approach is interesting because providers currently make little or no money on digital song purchases. Of the 99¢ per song, the owner of the recording, typically the record label, receives 70¢ to 75¢ for royalties or commissions. Credit card companies receive 27¢ per transaction. For single-song transactions the service provider will net a 3¢ loss to a 2¢ profit, assuming that there are no costs for providing the music [37]. This lack of profit opportunity suggests that the current 99¢ price may be set to grow the market as a whole, as well as the service provider's individual market share. Moreover, the sale of 99¢ songs in specific formats—such as Apple's licensed MPEG-4 Advanced Audio Coding (AAC)³ and Microsoft's Windows Media Audio (WMA)⁴—can also be seen as a lock-in strategy to promote sales of complementary products, such as expensive MP3 players.

Subscription services may become more popular due to Microsoft's new copyright protection tool, Janus [7]. Released in July 2004, Janus uses a hacker-proof clock to let consumers rent digital files for a predetermined amount of time. Bhattacharjee et al. [5] argue that because of piracy, a digital music distributor may be able to maximize profits by offering a mixed-model purchase and subscription service.⁵

Provider	Price per song	Price per album	Subscription price
Apple iTunes	99¢	\$9.99 for most albums	None
BuyMusic @ Buy.com	99¢, select songs 79¢	\$9.99 for most albums	None
MSN Music	99¢	\$9.90 for most albums	None
Napster	99¢	\$9.95, with select albums at \$6.95	\$14.95 per month access to entire collection
Yahoo Music	99¢ to burn a CD 79¢ with subscription	NA	\$4.99 per month access to entire collection
Walmart.com	88¢	\$9.44	None
eClassical.com	49¢ to 79¢	\$5.99 to \$7.99 for compilations	None

Table 1. Digital Music Providers' Current Pricing Practices.

Note: Prices are as of April 2005.

Research Questions

This paper analyzes the changing music industry from the perspectives of the players in the industry value chain: namely, the artists, the record labels/producers, the relevant intellectual property (IP) rights protection body, the physical retailers, the digital music retailers, and the consumers. It answers the following questions:

- What effect will digital music have on the music industry's market structure?
- What theoretical perspective can explain the changing roles of players in the recorded music value chain?
- What contextual evidence supports the robustness of the proposed theory for changes in the market structure of other digital goods industries?
- What actionable managerial recommendations does the analysis provide?
- What are the future prospects for artists, record labels, and consumers in the changing industry?

The paper evaluates the literature on pricing and property rights issues associated with information goods, as well as the literature on market structure and value-chain analysis. Based on this synthesis, it proposes a new *market participant role-based model* for understanding the digital music value chain. The model considers the traditional music value chain, key product characteristics of digital music, and related property rights issues. It enables a series of propositions that provide a theoretical interpretation of the ongoing industry transformation in terms of the roles of the market participants. We utilize

exploratory research methods to develop business and organizational mini-cases that identify leading issues and theoretical relationships in the digital music market [3, 25].

Overview of Relevant Theory

Three areas of theory are associated with digital music distribution: pricing of digital goods, market structure and value-chain analysis, and intellectual property rights. Theory related to the pricing of digital goods provides insights on the maturity of the digital music market and comparisons to other digital information goods. Market structure and value-chain analysis outlines the key theoretical concepts for the description of structural changes in the music market, and intellectual property rights theory provides a necessary lens for analyzing the key copyright issues associated with digital music.

Pricing in the Digital Economy

Pricing Strategy

Pricing strategy in Internet-based selling has received considerable attention in information systems (IS) research. Brynjolfsson and Smith argue that the Internet offers a low-friction channel for commerce [10], but other dimensions of Internet competition are important sources of heterogeneity among on-line retailers. For example, branding, trust, and awareness create additional drivers of price dispersion. In addition, Clay et al. [14] report substantial price dispersion among on-line book retailers. They suggest that Amazon.com was able to demand a premium price for on-line books because it differentiated itself based on service capability and brand recognition. Clemons et al. [16] found that product differentiation via on-line travel agents' services was a key driver of price dispersion.

The digital music market is in a *pre-price dispersion state* that may change as consumers begin to show differentiated demand for songs in digital format and for the service providers. Gallaway and Kinnear [29] found that older music could be offered at lower prices. Higher prices could then be reserved for new music, where demand is more inelastic and copyright protection is more strictly enforced. This suggests that pricing for digital music downloads should account for popularity. Thus, one expects to see the formation of market segments, price tiers, and increasing price dispersion. Recent research has provided new insights on pricing strategies and mechanisms for digital music on-line. For example, Chellappa and Kumar [11] argue that product competition and subsequent pricing on the Web is for expected and augmented bundles that include "free" Web-based services that add to the product-purchase experience. Chellappa and Shivendu [13] have developed a model for digital experience goods pricing and segmenting strategies in the presence of piracy, and Lang and Vragov [46] have developed a new pricing mechanism for digital content distribution using peer-to-peer networks.

Price Rigidity

The current consistent prices of digital music singles and albums suggest the existence of some basis for the observed price rigidity. Kauffman and Lee [42] suggest that there are five bases for price rigidity on the Internet: menu costs of price adjustment, underlying market structure, asymmetric information in industry business processes, demand-based drivers (e.g., consumer expectations), and contract-based drivers (e.g., subscriptions). Menu costs are low for digital music service providers because prices can be changed easily with an update to a database. Contract-based price rigidities are not likely because the market is too young to have any long-term contracts established between digital music sellers and buyers. In addition, industry price changes are easily viewed by competitors. But some firms maintain rigid prices to avoid signaling quality weaknesses to competitors or customers [58]. On-line firms compete on price first and then on non-price elements, such as customer service, promotions, and advertising [42]. Digital music is still in an early stage of development, so service providers have not established service capability or brand differentiation.

Versioning, Bundling, and Subscriptions

Shapiro and Varian [55] describe three strategies for pricing information goods: versioning, bundling, and fixed-fee pricing. As noted above, fixed-fee subscription services are available for digital audio streams. Similarly, bundles of digital music tracks—either a full album from one artist or a compilation of tracks compiled by the service provider—can be purchased for \$9.99. Altinkemer and Bandyopadhyay [1] demonstrate the application of flexible bundling strategies for digitized music based on an economic model. Different prices for different versions of digital music have also begun to surface. For example, BuyMusic from Buy.com provides 256 kbps songs (double the 128 kbps bit rate of standard music files) for a premium price. In addition, many on-line digital music retailers offer full-content or partial-content “try-before-buying” versions with lower audio quality. Naxos (www.naxos.com), a leading discount classical music label, used to provide full-download capabilities for individuals, but it recently altered its strategy to only permit potential customers to download 25 percent of the total content. Music versioning is also being considered in the physical CD market. BMG Germany began testing a new pricing model by offering three-tier versioned CDs: a €9.99 low-quality version with no cover art, a €12.99 medium-quality standard version, and a €17.99 high-quality version with bonus tracks and on-line extras (www.bertlesmann.com).⁶

For audio quality, a 128 kbps digital music file purchased from one provider is virtually the same as a 128 kbps digital music file purchased from another provider. Moorthy and Png [50] suggest that offering multiple versions of a physical good allows retailers to reach a market segment that may not already be served, yielding higher profits. Riggins [54] extends their model to an information-good setting with tiered Web sites. However, the same char-

acteristics of information-based goods that allow for easy versioning also allow unscrupulous users to violate copyrights by engaging in piracy activities. Wu et al. [61] argue that it is possible to fight the pirating of information goods with versioning. Still, versioning may become an effective tool in digital music pricing and marketing because it promotes self-selection.

Music Market Structure and Virtual Value Chain

The Virtual Value Chain

A new virtual value chain characterizes the digital music market. Rayport and Sviokla argue that there is a series of value-adding activities connecting a company's supply side with its demand side—the traditional value chain treats information as a “supporting element of the value-adding process, not as a source of value” [52, p. 76]. A virtual value chain exists when value-adding steps are performed through and with information. For digital music, there is no longer a physical product to manufacture. Instead the product itself is information—the digital music recording. Rayport and Sviokla further comment that companies which “create value with digital assets may be able to re-harvest them in an infinite number of transactions” [52, p. 82]. A song is recorded once, but in a digital format it can be replicated and distributed an infinite number of times with low costs for reproduction. In addition, songs in digital format can be sampled and remixed.

Benjamin and Wigand [4] identify four areas of opportunity and risk for stakeholders in on-line distribution: (1) benefits to consumers in that they have free market access to suppliers connected via the Internet, which translates into more choices, (2) lower coordination costs throughout the industry value chain, enabling e-links between suppliers (i.e., artists and digital distributors) and consumers, thereby reducing transaction and coordination costs, (3) lower physical distribution costs because digital music is reproducible at nearly zero cost, reducing distribution costs compared to physical formats of recorded music, and finally (4) potential for redistribution and reduction in total profits. With the changes come new opportunities for artists to bypass production of physical CDs and avoid royalty contracts that depend on recouping production costs. With lower costs, consumers may gain from lower prices, while artists gain a share of the profits they have not obtained before. However, Gopal et al. [33] caution that some leading music “stars” may see their star status diminished because of piracy. Contrada quotes one of the authors: “The news is bad for music's superstars. . . . Users are more likely to pirate a superstar's music than they are to pay to sample it because they are already aware of the value or likeability of the superstar's music” [20, p. 1]. Meantime, record labels and production companies may lose their shares. Thus, the changing structure of the value chain may have a major impact on the distribution of profits within the industry. Zhu [62] examined e-distribution of digital videos and found that, in the short term at least, more use of digital production and distribution technologies may result in significant cost reductions throughout the value chain.

Newly Vulnerable Market Structures

Changes in the value chain can drive changes in the underlying market structure, and vice versa. Mahadevan [48] discusses the new market structures of Internet-based e-commerce and the accompanying business models. Digital music providers act as product and service providers by dealing directly with the end-customer. The emerging digital music market supports dramatic reductions in production and distribution costs. But technology allows them to disintermediate other players too, by cutting out unnecessary steps in the value chain. Market structures and value chains are similarly subject to change.

Gosain and Lee [34] argue that the music market is especially subject to change. The Internet demographics of young, educated, well-off customers are suited to music purchases. The Internet allows sampling of products using digital audio files. The low consumer and seller risks resulting from the relatively low product costs may lead to impulse purchases. Moreover, the Internet provides reach and connectivity within the music market for buyers and sellers. The Internet also supports an emergent virtual market in which music labels and artists may move to distribute directly to consumers. There are five key differences between the physical and digital market channels: (1) decoupling of digital content from the physical carrier, (2) easy unbundling and rebundling of digital goods, (3) finer-grained control over the customer experience and dynamic pricing, (4) lesser importance of physical logistics and brick-and-mortar infrastructure, and (5) increased role for value-added information and the support of information-processing tasks. Each is apparent in digital music distribution.

Clemons et al. [15] interpret the emerging competition between music companies and their star artists as a result of on-line distribution. They note that music is increasingly produced using digital technology and distributed on digital media such as CDs, or in pure digital formats such as MP3s. Some music is created, distributed, and enjoyed without ever requiring physical production. Using the theories of resource-based value retention and newly vulnerable markets, the authors argue that music labels are vulnerable to falling profits due to the potential increase in the power of the artists because of digital technology. The digital music market is a newly vulnerable market: newly easy to enter, attractive to attack, and difficult to defend [15, 17]. Dramatic technology change has reduced the necessary cost of resources. The market is attractive to attack because of the presence of cross-subsidies from stars to unprofitable artists. It is difficult to defend because artists have opportunities to easily break away from record labels.

Recent economic analysis using the theory of incomplete contracts confirms that in the new virtual value chain for digital music, star artists' increased bargaining power should lead to profit-sharing arrangements that are more favorable to them [38, 53]. As a result, the new vulnerability of record labels and production facilities is forcing these players to adopt new strategies to maintain profit levels. The record labels can provide promotional and production management services, and can offer piracy prevention and copyright protection services, or they can attack on-line channels to lock out independent distribution.

Intellectual Property Rights

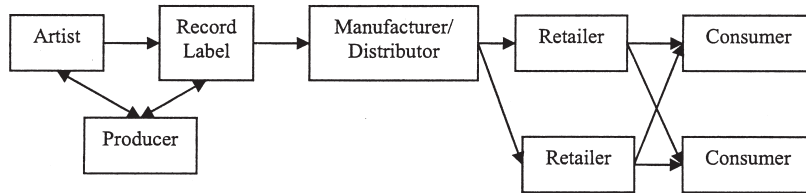
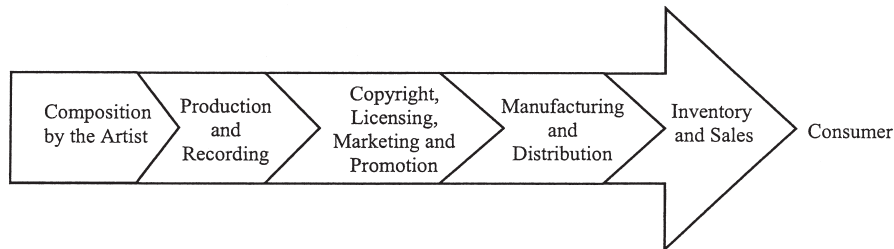
With information-based goods such as digital music, software, news, and e-books, most of the costs are in the development of the first copy of the good. Once developed, information goods can be reproduced and distributed at essentially zero cost. This unique aspect of information goods allows the producer to version the good to create free samples for potential buyers. However, the nature of information goods also allows pirates and file sharers to illegally copy and use the good without the producer's knowledge. Peer-to-peer (P2P) file-sharing networks such as Gnutella, KaZaA, and earlier versions of Napster threaten the business model of information goods producers by significantly reducing their sales. The popularity of these networks has become increasingly evident.⁷ Thus, enforcement of IP rights is crucial to the viability of on-line information-based goods markets. Conner and Rumelt [19] have shown that in the software industry, under certain circumstances, piracy can be beneficial to both firms and consumers by raising profit levels and lowering selling costs. Jiang and Sarkar [41] expanded this idea for digital music and have shown that some piracy may be useful in certain circumstances to encourage usage. Recent research by Chellappa and Shivendu [12] exploring the use of variable technology standards across geographic regions to thwart movie piracy may prove insightful in the digital music context. Gopal et al. [32] have developed an economic model to determine who, if anyone, benefits from on-line music sharing. Finally, Shapiro and Varian [55] point out that a key managerial trade-off in these markets is to balance the value created by allowing some freedom in terms of the mechanics of distribution, while maintaining a viable revenue model.

Theoretical Development

Conventional Recorded Music Value Chain

The traditional process for producing and distributing recorded music is complex and involves many players. The costs of developing and releasing a CD to the public can be in the millions of dollars, and most artists require label support to cover these costs. Typically, artists sign exclusive deals with record labels to get their music to the public. The record labels provide many essential services for their artists, such as artistic development, music production, CD manufacturing and distribution, marketing, promotion, publicity, sales, and legal representation. Figure 1 outlines the key players in the traditional music industry and shows the main drivers for value in the traditional recorded music value chain, which include copyright and licensing for airplay, production, distribution and inventory, and promotion and marketing costs.

Because of the essential services they provide, record labels make the most profit and have the most control over the value chain in the traditional market. According to Clemons et al. [15], record labels retain 35 percent or more of the revenues received from retailers. However, with the advent of digital music formats, there are many opportunities for changes in the recorded music

(a) Industry Market Structure**(b) Value Chain****Figure 1. Traditional Music Distribution Value Chain**

distribution value chain. Kauffman and Walden [43] argue that technology enables the transformation of products, business processes, and markets. In addition, markets are defined by the business process that permits transactions of specific products. With digital music, the new audio format standards and the Internet have enabled new music products and distribution processes. The roles of all the players in the traditional music industry are subject to change as the market adapts to the new digital music format.

The Digital Music Virtual Value Chain

The new digital music products have many characteristics that influence market structure. Like all information goods, digital music is easily reproduced, easily transferred, easily searched, and easily stored. These characteristics provide new opportunities for the production and distribution of music, but they also raise copyright concerns for artists and labels. Digital music files are also easily modified. This characteristic gives retailers and record labels the opportunity to easily version music files for new pricing strategies, and to provide clips and low-quality versions for product-sampling purposes. The modifiability of information goods makes it possible to supply the consumer with additional content, such as artwork and lyrics. Consumers value this characteristic because they can customize the music they purchase by remixing and sampling digital music files, but it raises copyright issues.

An example of this occurred in early January 2004 when DJ Danger Mouse, a relatively unknown artist at the time, combined digital versions of the Beatles' *The White Album* with rapper Jay-Z's *The Black Album* to produce *The Grey*

Album [30].⁸ This “mash-up” album became one of the most downloaded music files of 2004, with more than 100,000 downloads on February 24, 2004, alone, making it the most downloaded music that day on the Internet. This took place as part of an electronic civil disobedience protest against music label copyrights [60].

The equivalent-quality characteristic of digital music implies that for the average consumer there is no significant loss of quality in switching to a digital music file from a physical CD. For many consumers, digital music files are a product substitute for physical CDs. Finally, the digital format allows music to be separated into individual songs and rebundled in unique ways to form new products. Due to the separability characteristic, music content stored in the digital music format allows consumers the option of buying individual songs, full albums, or customizable compilations through new digital music retailers.

All of these characteristics enable new business processes and products for players in the music industry, and seem to be creating some new driving forces for market structure change. Table 2 outlines the impact of these characteristics on the players in the music industry value chain.

The adoption and diffusion of digital music, reduction of the “distance” between artists and consumers, wide distribution networks through the online channel, reduced costs of replication and production, and copyright protection and piracy issues will affect the music market structure. Moreover, the nature of the new digital music format will be a key driver of the new virtual value chain in the industry.

Five activities occur in the virtual value chain: gathering, organizing, selecting, synthesizing, and distributing information [52]. Clemons and Lang [17] provide a detailed analysis of the impact of changing digital technologies on these five value-added activities. For digital music, the creation and recording of music and the signing and promotion of artists represent the gathering and organizing steps. Selection and synthesis occur when the artists and record labels produce digital recordings. Distribution of information goods occurs when consumers buy digital music files from a distributor and download or stream content.

Intermediaries are economic agents that facilitate transactions between suppliers and buyers. They set market-clearing prices, make purchase and sales decisions, manage inventories, supply information, and coordinate transactions to provide the underlying market microstructure [57]. Their role in the music market is changing as a result of the digital music format. Physical retailers are being replaced by digital music retailers. Manufacturers and distributors are becoming obsolete as record labels, producers, and artists can go directly to digital music retailers without producing a physical product, bringing the music supplier and the consumer closer together. Figure 2 sketches the music industry value chain and market structure for digital music.

The added value to the music product from manufacturing and distribution is decreasing, but today digital music retailers are able to add new value. With Internet distribution and music piracy, they can now add value through marketing, promotions, copyrighting, and licensing. There is also value added through enforcement of IP rights and piracy prevention. The channel power

Characteristic	Players affected	How affected
Easily reproduced	Artist, record label	Low manufacturing costs High cost of making master Low break-even
Easily transferred	Artist, record label	Copyright issues Low distribution costs
Easily searched	Consumer Digital music retailer	Copyright issues Cheap, high-quality product Low display costs
Easily stored	Consumer Digital music retailer	Low search costs Low inventory costs Low menu costs
Easily modified	Consumer Digital music retailer Artist, record label Consumer	Likes high portability Values high compatibility Versioning opportunities Easy pre-purchase sampling Versioning opportunities Copyright issues Customizability Demands additional product features: artwork, lyrics, etc.
Equivalent quality	Consumer Physical retailer	More product options New entrants can compete
Separability	Artist, record label	Song single is product

Table 2. Digital Music Product Characteristics.

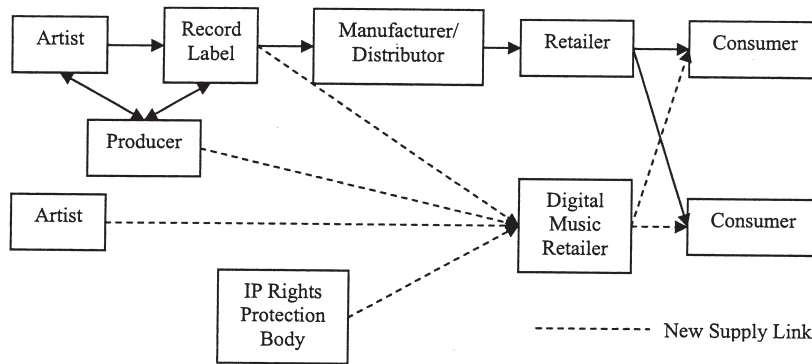
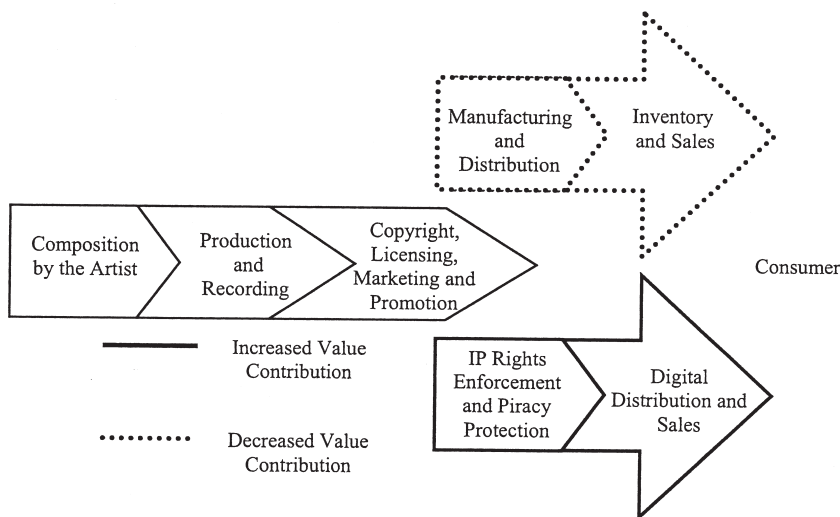
dynamics have been changing, and there are new incentives as roles in the value chain shift. The changed value chain is also likely to be affected by issues that relate to IP copyrights.

Propositions for Transforming the Digital Music Industry

The propositions presented below specify how each player is affected in a transforming digital music industry. The arguments are based on exploratory mini-case evidence selected for presentation from among a larger number of instances of similar changes observed in the marketplace over the past several years. The present analysis and discussion of the propositions are organized according to the players in the industry: music artists, record labels and music production companies, traditional brick-and-mortar retailers, digital music retailers, digital music consumers, and a newly proposed IP rights body.

Music Artists

New digital recording and distribution technologies present opportunities for artists to adopt a do-it-yourself approach. In the traditional recorded music

(a) Industry Market Structure**(b) Value Chain****Figure 2. Digital Music Industry Distribution**

industry, artists depended heavily on labels for access to production and distribution capabilities. With new digital technologies and the Internet, music artists have the ability to produce, record, and distribute music without help from record labels. A leading example is ArtistLed, Inc. (www.artistled.com), which focuses on the Internet. The company calls itself "classical music's first Internet recording company."

A survey by Rainie and Madden [51] reveals that 83 percent of musicians and songwriters provide music samples on-line. Free downloads provide consumers with a means to try an artist's music before purchasing and provide artists with a way to market themselves to sell more music and increase concert attendance. In this new digital environment, artists have incentives to compete directly with record labels and producers [15]. The digital music format has had a positive impact for the artist, who can leverage the technology

for further gains. Gosain and Lee [34] anticipate a decoupling of digital content from the physical carrier. Artists can distribute music directly to consumers through the Internet, bypassing intermediaries involved in the production and distribution of physical music media. The separability of digital music gives artists new incentives to unbundle full-length albums and focus on producing singles for sale.

Consider these propositions related to the artists:

Proposition 1a (Artist-Led Direct Distribution): *New incentives will induce artists to form their own on-line direct-distribution capabilities.*

Proposition 1b (Digitally Intermediated Distribution): *New incentives will induce artists to contract with digital music retailers for on-line distribution of their music.*

Proposition 1c (Music Singles Production): *New incentives will induce artists to focus on producing singles, not bundled music, for on-line distribution.*

The following three mini-cases illustrate these propositions.

Mini-Case 1a (Artists): “Beastie Boys Link to iTunes from Web Site.”

Prior to their full-length album release in June 2004, the Beastie Boys made use of their Web site to promote sales of their new album. The Web site provided samples of new singles and linked to Apple iTunes, where it was possible for a consumer to immediately purchase their music in digital format. The Beastie Boys continue to leverage their Web site to sell digital copies of their music, potentially cutting out the distribution and manufacturing intermediaries by shifting a percentage of sales from CDs to digital music files. *Source:* www.beastieboys.com.

Mini-Case 1b (Artists): “Freezepop—A Do-It-Yourself Approach.”

Freezepop, a Boston group, recorded an album using a \$300 sequencer, made two animated videos using inexpensive Shockwave Flash software, and developed a fan base by posting news, photos, and tour dates and offering merchandise on its Web site. The group subsequently managed to broker download-only distribution deals with on-line music stores, such as iTunes and Napster, effectively cutting out the need for a label and avoiding the production and distribution costs. This extreme example demonstrates the opportunities artists have to “go it alone” in the music industry by leveraging digital technologies. *Source:* Boutin [9].

Mini-Case 1c (Artists): “ArtistLed, Inc., the Living Room Record Label.” “[T]he Internet . . . favors cottage industries such as ArtistLed, the living room record label belonging to the husband-and-wife duo of cellist David Finckel, and pianist Wu Han. Finckel and Wu produce

their own CDs of cello sonatas . . . [sell] exclusively through their own website. Their costs are minimal and they pocket 100% of the sale price, so they do not need to sell many copies to break even. . . . 'Where do you think the clerk in an ordinary store would file our CDs?' asks Wu. 'Under "Miscellaneous Cello.'" But the Web site is like having our own store.'" *Source:* Davidson [24].

Mini-Case 1d (Artists): "Warner Music to Start e-Label." Warner Music recently announced a strategy to create a new music distribution mechanism that will rely only on digital downloads with no physical CD production. The new "e-label" will have its own roster of artists who focus on releasing two or three song "clusters" of music every few months rather than full-length albums every year or two. *Source:* McCullagh [49].

Record Labels and Production Companies

Record labels and production companies may lose in this new environment. Digital music distribution has the potential to reduce some of the major costs of producing an album and also opens the door for artists to bypass record labels. These costs include pressing and packaging the album, shipping costs for getting CDs to retail stores, and warehousing costs for maintaining inventory. Digital music is virtually costless to reproduce, transfer, and store. As manufacturing, distribution, and inventory costs are removed, artists will require less up-front investment to produce their music, and record labels will lose power over the value chain. Furthermore, as artists gain control, traditional producers and intermediaries will lose profits—unless they develop ways to maintain their capability to contribute value to the process by emphasizing value that artists cannot provide themselves. Record labels may choose to focus on providing services such as promotion and marketing management, production consulting services, and copyright enforcement services to maintain value contribution [15]. The record labels thus have an incentive to claim a new stake.

***Proposition 2a (Service Alliances):** Record labels will invest in digital distribution services alliances to maintain control over distribution in the new digital music industry.*

***Proposition 2b (Copyright and Promotion):** Record labels will find new ways to add value to the music production process via copyrights and new forms of promotions.*

The next two mini-cases illustrate these ideas.

Mini-Case 2a (Record Labels/Production Companies): "Bertlesmann Forms Alliance with Napster." Probably the first indication that record companies were taking digital music seriously occurred in 2001

when the media conglomerate Bertelsmann, owner of BMG Entertainment (a major record label), formed an alliance with the P2P file-sharing service Napster. Following legal battles, Roxio Inc. acquired Napster and restructured the firm as an on-line legal pay per download and subscription service in 2004. BMG's interest signaled the power of the digital music format in the eyes of the record labels. *Source:* Borland [6].

Mini-Case 2b (Record Labels/Production Companies): "Sony Launches Download Service." Sony launched its own on-line music service, Connect, on May 4, 2004, to compete with the industry leader, Apple iTunes. Sony not only produces music through its record label, Sony Music, but also manufactures electronic devices that play digital music formats. Connect will provide digital music downloads that are compatible with Sony devices using flash media technology. Sony Music also provides digital music files to other on-line music distributors, such as iTunes and MSN Music. *Source:* Graham [35].

Intellectual Property Rights Protection Body

Since digital music is easy to reproduce and transfer, there is growing concern and debate over music copyright issues. Legal, government, and advocacy organizations (e.g., the Recording Industry Association of America, or RIAA) have begun to take a larger stake in the music industry because of these new concerns. Several technological advances, such as digital encryption, digital watermarking, traffic-volume monitors, and time-triggered content-decay mechanisms, can dissuade illegal copying of digital files.⁹ Even so, Clemons et al. [15] note that the music industry can add value to the digital music value chain by developing a contracting and legal mechanism to stamp out digital music piracy. This will include newer and tougher enforcement of existing copyright laws and perhaps the creation of new copyright laws for the digital age. Recent research has shown the increased impact of segmenting digital products on piracy and the effectiveness of using sampling strategies for digital products [13, 59]. This research points to an increasingly important role for the record label in stopping music piracy and providing copyright enforcement and protection for artists. The new IP protection needs of the music industry will be met by legal, government, and corporate players. The conceptual model presented in this article incorporates a new entity called the "Intellectual Property Rights Protection Body."

Proposition 3a (Intellectual Property Rights Enforcement): *An intellectual property rights protection body will contribute to the value chain by enforcing property rights and fighting piracy of digital music.*

Proposition 3b (Record Labels' Role in Piracy Protection): *Record labels will contribute to the value chain by fighting music piracy through the administration of new pricing (segmenting) and sampling strategies.*

Recent developments with respect to Grokster (www.grokster.com), a P2P file transfer software provider whose legal wrangle with a number of record labels and music producers was recently decided by the United States Supreme Court, provides an example of these concerns.

Mini-Case 3 (Intellectual Property Rights Protection Body): “Supreme Court Hears Music Piracy Case.” Major record labels sued Grokster (www.grokster.com) for promoting and facilitating illegal downloading of pirated music through its P2P software. A San Francisco court found that since Grokster allows users to share music files without connecting to a central server (unlike the original Napster), it should not be held accountable for piracy using its software. The record labels and Hollywood studios combined forces to appeal the case to the Supreme Court, which began hearing the case in March 2005. In July 2005, the Supreme Court ruled against peer-to-peer technology producers, holding them responsible for copyright piracy on their networks. This debate is likely to continue as new technologies are introduced and adopted, and there is a definite need for a legal body in the new digital music industry. *Source:* Crawford [21].

Brick-and-Mortar Music Retailers

Brick-and-mortar retailers stand to lose more customers to on-line digital music retailers unless they offer new products and services. Physical logistics and infrastructure will become less important as digital goods grow in popularity [34]. Traditionally, physical music retailers have held inventory, facilitated sales to consumers, and provided promotional and marketing space and opportunities for record labels. To avoid becoming obsolete, brick-and-mortar music stores will need to sell a music “experience” to the customer. Additionally, brick-and-mortar stores must learn from on-line digital music retailers about how to identify new products and services that appeal to the current generation of digital music consumers. Combining nightclubs, tattoo parlors, workstations, and live performances with the traditional music store are possible ways to add value to the customer experience. This leads to:

Proposition 4 (Brick-and-Mortar Customer Experience): *Brick-and-mortar music retailers will diversify their product offerings and enhance the shopping experience to retain customers.*

Mini-Case 4 (Physical Retailers): “Mix&Burn Kiosks Provide Physical Retailers with New Options.” Mix&Burn, a company based in St. Paul, Minnesota, offers a new technology for brick-and-mortar retail music stores. Its “music tablet” is a kiosk for in-store use that allows customers to browse and sample a large library of songs, select and arrange customized playlists of their favorite tracks, and burn a CD of the playlist at a price comparable to a standard music CD. The tablet gives physical retail stores the opportunity to provide services to

consumers that were previously only available on-line. As of April 2005, Mix&Burn tablets were in use at ten retail locations in Minneapolis/St. Paul, Chicago, New York, Boston, and Norfolk. *Source:* www.mixandburn.com.

Digital Music Retailers

Digital music retailers are quickly building large installed bases of customers. As the number of digital music consumers increases, digital music providers' control over the costs associated with selling music on-line will also increase. Unbundling and rebundling are easy for digital goods, enabling more fine-grained control over the customer experience and dynamic pricing [34]. For other information goods, on-line retailers differentiate themselves with branding, services, and trust, as in the book and travel industries [10, 16]. Strategies such as versioning and bundling permit them to offer unique products to meet consumer demand with varying levels of willingness-to-pay. Recent research has shown that "free" Web-based product-augmenting services can affect on-line sellers' pricing and customer-retention strategies [11].

The changing marketplace provides opportunities and challenges for on-line digital music retailers. They must consider new products and services, and develop ways to differentiate themselves in this rapidly growing market. This leads to the next set of propositions.

***Proposition 5a (Digital Music Retailer Differentiation):** Digital music retailers will differentiate themselves by offering new and unique products and services.*

***Proposition 5b (Digital Music Price Dispersion):** Digital music retailer differentiation will result in price dispersion in the on-line digital music market.*

The increased use of bundling, versioning, and "free" product-augmenting services may make it difficult to measure price dispersion in digital music products as the market matures [11]. Two mini-cases on Apple iTunes' innovations for pricing and customized playlists illustrate this.

Mini-Case 5a (Digital Music Retailers): "Apple iTunes Custom Playlists for Download." The market-leading on-line digital music retailer Apple iTunes offers unique bundles of music tracks designed by celebrities and staff for download. These playlists have individual tracks from various artists based on a theme or genre. For example, a consumer can download a collection of songs selected by the New England Patriots quarterback Tom Brady. Alternatively, a consumer can download the Totally 80s Playlist, which includes hit pop songs from the 1980s. The separability of digital music into individual songs lets retailers create unique product bundles and differentiate themselves from other retailers. Apple iTunes also offers a community

service called iMix that allows consumers to post their own playlists to the iTunes stores. Consumers can browse iMix and purchase the playlists recommended by other users. *Source:* Apple iTunes, www.apple.com/itunes.

Mini-Case 5b (Digital Music Retailers): “Apple iTunes Tries New Pricing Strategies.” Apple iTunes prices the majority of its catalog at 99¢ for a single song and \$9.99 for complete albums. However, Apple has recently begun experimenting with new pricing strategies. Newer albums have been priced higher—for example, Aerosmith’s latest album was priced at \$11.99, and Joe Satriani’s newest release was \$14.99. Other on-line retailers, such as Napster, offer discount albums for \$6.95. Some record executives say they are eager to test tiered-price models in the digital music market. Price is another dimension along which digital music retailers can achieve differentiation from their competitors, and it seems to be catching on in the digital music market. *Source:* Borland and Fried [8].

Digital Music Consumers

Legal and illegal download services for digital music have had a significant impact on physical CD sales, as mentioned earlier. The consumer now has the option of buying one song for 99¢ rather a whole CD for \$15.99. This new sales model reduces loss of utility: Consumers only purchase the songs they want, creating their own bundles. Rather than relying on a record company or artist to assemble a set of songs into an album, the consumer can pick songs from various artists and assemble a bundle of \$15 worth of music.

Personal digital music players have very large storage capacities now, making music collections more portable and transferable than ever before. In addition, the digital music format allows the consumer to turn multiple devices into music players. Consumers can listen to digital music files using PDAs, laptop computers, desktop computers, and mobile phones; and digital music files can be converted and burned to CDs for play on standard CD players. The digital music file may be the recorded music industry’s first universal format. Downloading and purchasing digital music is easy, only requiring a personal computer connected to the Internet. Moreover, the transferability of the new digital format gives a consumer instant access to thousands of music tracks with minimal effort.

“Ripping” digital music at 96 kbps or higher provides about the same audio quality as a physical CD. While some audiophiles may claim there is a loss of quality, for the average consumer there is no perceptible difference in quality between digital music and a physical CD. Furthermore, unlike other information goods, the interface for digital music is the same as the interface for its physical counterpart—digital music is experienced through speakers and is listened to, the same as a physical CD. This suggests why digital music has been a success whereas digitized text products have not. The latter are consumed through use of a different reading interface, so a reader no longer reads from a paper copy, but from a luminous screen.

Unfortunately, as holds for any successful new technology, there is hype associated with digital music downloads. The popularity of digital technologies and the upsurge of P2P systems have increased consumers' bargaining power [47]. Hughes and Lang [40] argue that the Internet and P2P systems allow consumers to organize themselves into powerful networks. Huang [39] has developed an analytical model that incorporates moral judgment, expertise, and social networking to describe the consumer's use of digital technologies in file-sharing behavior as a form of music consumption. The enhanced communication capabilities among consumers also improved their opportunities to organize, as was mentioned earlier in respect to the Grey Tuesday organization that sprang up around *The Grey Album*. Clearly, digital music customers have been setting new trends in both technology and music in the past several years. Analysts believe that these trends will continue to attract many new music customers to the Internet and support the persistent adoption of digital music services. Thus, one may assert:

***Proposition 6 (Digital Music Consumer Adoption):** Many consumers will continue to adopt and purchase digital music as more services and products are introduced. As a result, digital music may become the dominant format for recorded music products, resulting in a strong critical mass for the related technologies.*

The final two mini-cases illustrate these ideas for digital music consumers.

Mini-Case 6a (Digital Music Consumers): "iTunes Popularity Grows Exponentially." Apple iTunes increased its downloader base from 861,000 in July 2003 to 4.9 million in March 2004. Since 2004, the iTunes downloader base has grown to over 10 million registered users. Because of this success, Sony, Microsoft, Virgin, Yahoo, and even AOL have either entered the market or are making plans to do so. *Source:* Borland and Fried [8] and www.apple.com/itunes.

Mini-Case 6b (Digital Music Consumers): "The 40GB iPod." Apple sells the most popular digital music player on the market, the iPod. As of mid-2005 the iPod was available in models with storage capacities ranging from 1 to 60 GB. A 40GB iPod can hold 10,000 songs, equivalent to approximately 670 music albums. iPod owners can carry a library of music in their pocket. The portability of the digital music format makes this possible and provides new incentives for consumers. However, at current prices—99¢ per song—it would cost a consumer about \$10,000 to legally fill an iPod. *Source:* Apple Computer, www.apple.com/ipod.

Discussion

The changes in the structure of the digital music market have implications for strategy and management in the music industry. The preceding propositions

and mini-cases should make it apparent that the power traditionally associated with some players has been shifting to others. The move from physical forms of recorded music to digitally formatted music files has been decreasing the necessity for traditional sales channels and distribution processes. Artists now have the power to distribute their own music, record labels are not needed to cover the costs of manufacturing and distributing physical recordings, and traditional brick-and-mortar music retailers may become obsolete, if most recorded music transitions to digital formats. Meanwhile, the new digital music retailers are fighting to differentiate themselves and capture larger shares of the profits from distributing digitally formatted music. These new power dynamics have led to several strategic opportunities for the players in the music industry. The discussion in this section presents and discusses a number of specific recommendations for actions these players may take to be successful.

Players' Actions in the Digital Music Industry

Artists

As music artists begin to consider their options for digital music distribution, they must identify where they need help. There are many costs associated with producing a new album. These include studio recording and music production costs, manufacturing and distribution, marketing and promotion, and legal fees. While artists may have the ability to record and distribute music themselves in digital format, record labels can still provide valuable artistic direction, promotion and marketing services, and backing for IP protection. Manufacturing, distribution, and warehousing make up a considerable portion of the production costs for a new CD. If artists expect to receive a percentage of sales from digital files, they can negotiate new contractual agreements based on the lower production and distribution costs.

Artists must understand which steps in the process of releasing a new album they can do themselves and which need label support. Moreover, they need to consider their position in the music industry. A well-known music group may have the ability to produce and distribute music successfully on its own without any record label support because of brand effects. A newer, relatively unknown group may be able to use digital distribution to establish a name and then rely on a record label to boost its popularity and fan base. Alternatively, a music group could use on-line marketing strategies to leverage fan-to-fan community interaction effects on the Internet to build a fan base. Thus, many factors must be considered by artists when making a decision about going on their own.

Record Labels

Although record labels have the potential to lose profits and control in the new digital music industry, they will adapt by providing services that artists

cannot provide for themselves, in a pattern similar to B2B electronic market services providers [22]. They should focus on the artistic development, marketing, promotion, and licensing services they currently provide to artists. Most artists simply do not have the resources to market themselves as effectively as can a record label. Nevertheless, the record labels need to embrace the new digital distribution methodologies for recorded music. They will probably play a critical role in enforcing copyrights and preventing piracy as these services become increasingly important in the value chain. Record labels also should consider either forming alliances with existing digital music retailers or launching their own services. Often, record labels decide to shelve finished albums because forecasted sales forecasts do not compensate for the pressing, distribution, and marketing costs of a physical CD release. Releasing these albums to on-line music retailers as beta versions for virtually no additional cost may be a good test. Today, the primary distribution channel for digital music is the Internet, where there are now unique opportunities for the on-line marketing of digital music. Record labels should consider opportunities to advertise and attract customers to this on-line channel, and should explore the creation of strategic alliances.

Intellectual Property Rights Body

Easy transfer and reproduction leave songs vulnerable to piracy, and P2P file sharing has hurt artists and record labels. It is crucial (as seen with the RIAA's lawsuits in 2003) for the key players to enforce IP rights restrictions, and to promulgate effective copyrights and licensing for digital music distribution. Similarly, technology firms can influence the music industry through technological innovation. Microsoft's Janus technology is a technology company's effort to enter the music industry and provide tech support for digital property rights protection [28]. Organizations involved in the enforcement of the copyright of digitally formatted music must consider new technologies and strategies for monitoring piracy.

Traditional Brick-and-Mortar Retailers

Brick-and-mortar music retailers must develop new strategies to retain customers and profits. One such strategy may be to offer products and services similar to those offered by on-line stores, such as providing prior-to-purchase music sampling, allowing customers to create their own bundles of music, and providing digitally formatted music for consumers to load directly into their MP3 players. Physical retailers should also focus on services they can provide that are not available on-line. Customer service and support can help customers who wish to explore new music. In-store performances and promotions can provide additional incentives for consumers to visit the retailer. Sales of complementary products, such as T-shirts, posters, and DVDs, may also attract consumers. Physical retailers need to provide for the needs of the digital music consumer and offer a unique in-store experience that cannot be achieved on-line.

The New Digital Music Retailers

Digital music providers have incentives for differentiating themselves with product versioning, services, and branding to achieve higher profitability. Digital music retailers also should consider offering new services, such as recommender systems, versioned products based on audio quality or copyright restrictions, and product extensions. The latter include downloadable lyrics, artwork, liner notes, and additional content found in enhanced CD versions, such as video games, desktop wallpaper, and video clips. Bundling is a key strategy for offering unique products to customers. The ability to separate digital music into single songs provides an opportunity for digital music retailers to offer unique bundles of their own design and to let consumers define their own bundles of music. On-line digital music retailers should also consider forming strategic alliances with artists or record labels to attract a fan base to their store. Dai and Kauffman [23] have shown the efficacy of this “partnering for perfection” approach in business processes for B2B e-procurement markets, as a means to acquire and create business value for installed bases of buyers and sellers. As the popularity of digitally formatted music continues to grow, digital music providers stand to gain contractual bargaining power to negotiate more attractive royalty fees with the record labels and to retain a larger share of the profits.

Consumers of Digital Music

Consumers have the potential to gain the most from the new digital music industry. Digital music is portable, transferable, and easy to modify. But the line between consumer and artist is becoming blurred. It is easy for consumers to modify “mash-up” digitally formatted music to make new music, a recent trend that has been growing in popularity. Rock musician David Bowie (www.davidbowie.com) and his unlikely partner, the automotive company Audi AG (www.audi.com), held a “David Bowie Mash-Up Remix Contest” in April 2004 for the best song mash-up. David Bowie digital music samples were made available via the Internet to contestants (via www.davidbowie.com/neverFollow/), who could also download a trial version of software to create a new remix.

In the new digital age for music, the artist and the music consumer share the power to shape the success of new music technologies and services. Table 3 summarizes the structural shifts in the music industry and the corresponding strategy recommendations for each player.

Conclusion

At this point it is appropriate to discuss the contributions of the research presented in this paper and the generalizability and robustness of the findings. It is also appropriate to comment on the usefulness of this kind of research relative to an emerging theme in IS research: the study of transitioning market equilibria.

Player	Conventional value flows	Digital music value flows	Effects of structural changes	Strategy recommendations
Artist	Music composition and artistic creativity Recording of music Performances, appearances	Composition, performance (creativity) Recordings, performances, appearances Production, distribution arrangements	More control of production, distribution Higher profits Less copyright protection	Identify steps requiring record-label support. Rethink record-label contracts.
Label and production company	Copyright enforcement Production, manufacturing of recorded music Distribution, marketing, promotion Limited IP rights enforcement	Copyright enforcement Marketing, promotion, advertising	Loss of control over production, distribution Lower profits	Focus more on artistic development, promotion, and marketing services. Form strategic alliances with on-line digital music retailers.
IP rights enforcement body	Limited IP rights enforcement	IP rights enforcement Piracy prevention Prosecution of piracy cases	Increased control over legal distribution of digital music	Consider new technologies and penalties for enforcing copyright.
Physical retailer	Distribution to customer Advertising	Potential distribution of digitally formatted music at physical point-of-sale	Loss of customers/sales Decrease in profits	Provide for needs of digital music consumers. Provide unique in-store experience that cannot be matched on-line.
Digital music retailer	None	Distribution to customer Advertising Services (search, recommendations, etc.)	Growth of digital music market Potential profit increase Increased competition	Differentiate versioning, bundling strategies. Offer new services (e.g., recommender system). Provide exclusive distribution for artists and labels. Update contracts with labels to gain larger share of profits.
Consumer	Purchase music in physical format	Choices: purchase physical format or digital format, or pirate digital format	New supply channel More product choices More power over prices	

Table 3. Power Shifts Among Music Industry Players Leading to Strategy Recommendations.

Contributions

This paper offered a high-level assessment of the changing market structure in the on-line digital music industry. The theoretical interpretation is based on value-chain analysis, market-structure characteristics, and the different stakeholder perspectives of each player in the recorded music market. This theoretical perspective led us to assert a series of propositions that characterize some further changes that are likely to occur. In addition, we identified change drivers and presented a series of mini-cases to provide support for the theoretical interpretations. We also suggested a number of strategies that players may use to deal with the changing market in digital music distribution. This work is relevant to IS and marketing researchers and managerial audiences because it provides an explanatory perspective on the emergence of a new market and identifies potential drivers for value creation.

The analysis in the article focused mainly on popular music, but the story from start to finish could equally well have been told for classical music. As an example, eClassical.com (www.eclassical.com) offers single downloads of classical performances and compilations of various performances. Prices for singles are slightly lower than the pop music examples—only 49¢, instead of 79¢ per song. Pop music titles are more like best-selling books, whereas some classical music titles are more like “steady-sellers” (e.g., Jane Austen or D.H. Lawrence classics). Thus price differences occur, just as one sees in bookstores.

Generalizability, Confirmatory Analysis, and the Value of Studying Transitioning Equilibria

Exploratory case study research is always subject to the criticism of lack of generalizability across different research settings. It may also be subject to refutation based on the use of contradictory evidence from other case studies. In this sense, the authors’ “desk drawer results” are probably as important as those presented in this paper. There are many examples and illustrations of the developments in the digital music industry chronicled in this paper. However, the digital music industry’s market structure transformation has not been observed long enough to launch empirical research. Such a study would be limited by insufficient data. Confirmatory empirical analysis of the propositions presented here is something best left for later, as the marketplace for digital music matures and the industry reaches some sort of equilibrium.

There is significant value in investigating dynamic behavior and the transformation of marketplaces and economies. Clemons and Weber [18, pp. 4–5] point out that it is important for IS researchers to study settings with methodologies that go beyond the traditional analytical models that support theory building in economics and with the empirical methodologies that support confirmatory analysis. They further argue that there often is less interest associated with the outcomes in markets, and more in the transitions that occur between market equilibria—as well as the direction of movement away from the prior equilibrium. Finally, they comment that information technology may sometimes be the whole story—the key element in the mix that leads to the

destruction of a prior equilibrium or the inability of a market to achieve any recognizable equilibrium. Although most of their observations pertain to the operation of global financial markets, their insights regarding uniqueness in IS research deserve embrace in contexts such as the one studied here. In line with Clemons and Weber's views, the entire purpose of this research has been to study the transformation of a marketplace and the accompanying effects on the players that participate in it. Thus, even though it is not possible to fully forecast how the future markets for digital music will work, we have offered a number of directional insights relative to some possible future equilibria that are worth additional investigation.

Although the conceptual model presented in this paper is intended for the music industry, it is applicable to other industries as well, especially the market for information goods involving entertainment. The quickly growing downloadable-movie market has many similarities. The traditional market for physical CDs and DVDs is also moving from one equilibrium to another still-unknown future equilibrium. Digital movie downloads provide the same interface and user experience as traditional DVD and videocassettes. Like digital music, digital movies also are easily reproduced and transferred. Movielink.com (www.movielink.com) is an example of an on-line digitally formatted movie retailer that offers downloadable movies via broadband connections. We expect that trends in the movie industry will mimic those in the music industry, even though there has not been sufficient adoption to date that would provide facts and the figures in support of this assertion.

Future research may consider the two main pricing strategies for digital music: pay-per-song download and subscription services. Today there are ample opportunities for data collection and the development of new explanatory and normative theoretical perspectives that relate to pricing strategies for Internet-based sellers of digital music. Extensive work in pricing for Internet-based sale, for example, is already being conducted for music CDs and movie DVDs (e.g., [42]), so it would be natural to extend this work to the fully digital downloading business. In addition, there are many opportunities to explore consumers' willingness-to-pay in the context of illegal file sharing and piracy. This work will be also be useful in showing the efficacy of different business models in the digital music industry.

NOTES

1. Ram Chellappa provided useful suggestions for developing this discussion on pricing in the music industry. For additional history, the interested reader should see Wikipedia at http://en.wikipedia.org/wiki/Music_single.

2. In mid-2005, Enders Analysis (www.endersanalysis.com) estimated that the global recorded music market in 2004 reached \$34.4 billion. The 1.4 percent increase in U.S. sales in 2004 was accompanied by a 9 percent retail price decline, however, and so the shift up in sales was viewed as just a short-term shift. In October 2004, Enders reported 2003 global sales at \$32.1 billion, with a 2004 estimate of \$31.4 billion, and subsequent estimates of \$30.7 billion in 2005, \$29.6 billion in 2006, \$28.8 billion in 2007, and \$28.6 billion in 2008. See [www.endersanalysis.com/enders/documents/Recorded Music 2004 ES \[2004-36\].pdf](http://www.endersanalysis.com/enders/documents/Recorded Music 2004 ES [2004-36].pdf).

3. For additional information on AAC, the interested reader should see

www.aac-audio.com. Apple Computer [2] comments: "Because of its exceptional performance and quality, Advanced Audio Coding (AAC) is at the core of the MPEG-4, 3GPP, and 3GPP2 specifications and is the new audio codec of choice for Internet, wireless, and digital broadcast arenas. AAC provides audio encoding that compresses much more efficiently than older formats such as MP3, yet delivers quality rivaling that of uncompressed CD audio. . . . AAC was developed by the MPEG group that includes Dolby, Fraunhofer (FhG), AT&T, Sony, and Nokia—companies that have also been involved in the development of audio codec such as MP3 and AC3 (also known as Dolby Digital). The AAC codec in QuickTime 6 builds upon new, state-of-the-art signal processing technology from Dolby Laboratories and brings true variable bit rate (VBR) audio encoding to QuickTime." Quoted from www.apple.com/mpeg4/aac/.

4. For additional information on WMA, the interested reader should see the Web site and white paper at http://download.microsoft.com/download/a/e/3/ae32d073-2a41-48f4-9907-baa8d8d5eb7b/Intro_to_WM9Series.doc. Shaw writes: "The key to the compression (encoding) process is software known as a codec. *Codec* is an acronym for *compressor/decompressor*. As its name suggests, codecs are used to compress (encode) digital media files for efficient storage and transmission, and then decompress (decode) the files upon playback. . . . Codecs are based on complex mathematical formulas that usually attempt to minimize file size while maintaining sound and image quality. Many codecs are available—each with its strengths and weaknesses. Examples of some older, well-known codecs are the MP3 audio codec and the MPEG-2 video codec. Typically, files encoded by using these codecs have the file name extensions .mp3, .mpg, or .mpeg. . . . Microsoft has developed several newer codecs that provide excellent audio and video quality over a broad range of compression levels. Collectively, these codecs are known as Windows Media 9 Series. They are the foundation of the Windows Media 9 Series platform, which includes programs such as Windows Media Player 9 Series, Windows Media Encoder 9 Series, Windows Media Services 9 Series, and Windows Movie Maker 2" [56].

5. With such low profit margins in digital music, new transaction strategies are being developed to increase profits for digital music service providers. Peppercoin (www.peppercoin.com) uses proprietary technology to cut all-in transaction costs to 7¢ to 9¢ per transaction. iTunes waits card until the end of the day to charge a customer's credit, bundling purchases into one transaction.

6. There have been interesting changes in the approach taken by providers of digital music with respect to downloadable samples. For example, some providers offer some full samples of parts of their music catalog with full quality, while others offer full samples of their whole catalog with less-than-best quality. Still others make available partial samples with full quality (Naxos's current approach), some partial samples with full quality, and so on. Unfortunately, there has been little research to date to guide managers in making decisions about optimal sampling strategies.

7. Napster went from zero users in June 1999 to 1 million in November 1999, and then on to 10 million in April 2000 and 20 million in July 2000—an astonishing rate of growth matched only by ICQ (www.icq.com), MSN Hotmail (<http://hotmail.msn.com>), and now the voice-over IP provider Skype (www.skype.com) [27, 31, 36].

8. For additional information on this, the interested reader should see the overview provided by the Electronic Frontier Foundation [26], which offers an analysis of the IP rights holders and their capabilities to prove that copyright infringement occurred, the extent to which the Grey Tuesday protesters were protected for their "fair use" of the Grey Album, and their decisions to post. A second useful source is provided by Grey Tuesday (www.greytuesday.org), which posted the details of the protest, the participating Web sites, related coverage of the events in other publications, and other explanatory materials. A final source is Downhill Battle (www.downhillbattle.org), which describes itself as a "non-profit organization working to support participatory culture and build a fairer music

industry,” and which makes and promotes the use of open-source software for music file sharing.

9. The open-source Wikipedia offers some useful definitions. “*Digital watermarking* is a technique which allows [someone] to add hidden copyright notices or other verification messages to digital audio, video, or image signals and documents. Such a message consists of a group of bits describing information pertaining to the signal or to the author of the signal (name, place, etc.). The technique takes its name from watermarking of paper or money as a security measure. Digital watermarking is a form of *steganography*, in which data are hidden in the message without the end user’s knowledge” (http://en.wikipedia.org/wiki/Digital_watermarking; see also [45]).

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