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Network Perspectives on the Relevance of New Revenue Streams in the Digital Era Music Industry

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Abstract

Along with the shift in the distribution of prerecorded music from retail outlets to online and satellite sources engendered by digital technology came changes in the roles of the various participants and the introduction of new participants. With displacement taking place, the authors wish to assess the relative importance of newly created revenue streams in the digital era. This study focuses on the economic implications of changes in network relationships fostered by digitized music and consequently the method of analysis is Social Network Analysis (SNA). This is the first study of its kind to assess the relevance of the revenue streams from a network perspective. Results show that traditional agents in the music industry (songwriters, artists, music publishers, record labels) have retained their relatively strong positions since the year 2000. However, some new agents (revenue streams) in the digital era are significantly reorganizing the network as a whole. When weighted for economic impact, digital aggregators/interactive service payments, digital performance royalties/SoundExchange, the YouTube Partner Program, as well as crowdfunding, rank in the top half of economic relationships. The study offers quantifiable validation to its findings and informs us that the “new” revenue sources have not yet achieved their full economic potential but are already well positioned to undermine the dominance of the more traditional revenue streams in the music industry.

Keywords: music industry, social network analysis, revenue streams, digital music

Editor's note: the charts in this article are high resolution images that may be enlarged for detailed viewing on screen or for printing. The print edition of the MEIEA Journal contains monochrome versions of these same images.

Introduction

Along with the shift in the distribution of prerecorded music from retail outlets to online and satellite sources engendered by digital technology came changes in the roles of the various participants and the introduction of new participants. With displacement taking place, the authors wish to assess the relative importance of newly created revenue streams in the digital era. This study focuses on the economic implications of changes in network relationships fostered by digitized music and consequently the method of analysis is Social Network Analysis (SNA). This is the first study of its kind to assess the relevance of the revenue streams from a network perspective. Results show that traditional agents in the music industry (songwriters, artists, music publishers, record labels) have retained their relatively strong positions since the year 2000. However, some new agents (revenue streams) in the digital era are significantly reorganizing the network as a whole. When weighted for economic impact, digital aggregators/interactive service payments, digital performance royalties/SoundExchange, the YouTube Partner Program, as well as crowdfunding, rank in the top half of economic relationships. The study offers quantifiable validation to its findings and informs us that the “new” revenue sources have not yet achieved their full economic potential but are already well positioned to undermine the dominance of the more traditional revenue streams in the music industry. To understand the significance of these new agents, one needs to understand the role of advances in technology in the digital distribution and consumption of music.

Technology drives digital music delivery. Although downloading music from the internet was in theory possible from the start of that medium—since music can be converted into digital formats like any other content and can be distributed accordingly—it was not until the end of the 1990s that four major technological developments changed downloading music and sound from a possibility to a reality. The first and best-known development of compression technology was the MP3.¹ The Fraunhofer

MP3 reduced sound file size without losing too much quality. A 128KB MP3 version of a CD track is ten to twelve times smaller than the original file. The second development was the introduction of high-speed, flat-rate internet connections. First ISDN, and after that cable and ADSL connections reduced download time to a fraction of what it used to be. Formerly, an MP3 track would take 24 minutes to download with the standard 14.4KB modem while a T1 connection can accomplish the same within 20 seconds. The third development was the introduction of multimedia computers with more storage capacity and sound playback capabilities such as sound cards and speakers. Hard disk capacity moved from 10-20MB, which was only suitable for storing two to five tracks, to 300-500GB. The last and most visible development was the introduction of free, user-friendly software to “rip” CD tracks into MP3 files, to play MP3 tracks, and most of all to download music files from the internet.

The importance of internet-downloaded music reached its watershed in the year 2000. Internet file sharing (mostly music) exploded with the introduction of Napster in mid-1999. By 2000 the internet started becoming a fundamental force for change for the music industry. Whether this was constructive or destructive depends in large part on the response of the established players. The issue was recognized early on by Leyshon (2001):

Software formats have elicited a conservative, critical response, a discourse founded in the existing social and technological hierarchies of the industry. Meanwhile, on the other hand, software formats have been welcomed by others precisely because they are seen to be a means to dismantle the industry’s established hierarchies and power relations. Although in opposition to one another, these two positions at least agree upon one thing: that the rise of software formats such as the MP3 will bring about the end of the music industry as it is currently configured.²

Each managerial generation in the music business embarks on the same enthusiastic quest for the next “new thing” and each generation faces the same vexing challenges, most of which stem from tensions between protecting existing revenue streams critical to current success and supporting new concepts that may be crucial to future success.³ This tension has been highly manifested in the digital era.

New Business Models for a New Era

When the first legitimate online retailers entered the market, the major record companies were somewhat reluctant to license their music to these services. However, with the rapid growth of illegal file sharing, record companies realized they had to offer file sharers an alternative to illegal downloading in order to limit the damage sharing was causing. This led to an increasing willingness among the record companies to license content to online music services.

The first legal service selling music online was eMusic, launched in the United States in 1998. This was followed by Wippit (U.K.) in 2000 and Pressplay, MusicNet, and OD2 in 2001. Many smaller, independent companies did license content to these services.

However, these companies failed to acquire content from the major record companies with many of the most popular artists and consequently did not attract massive appeal in the consumer market. It was only with the introduction of the iTunes Music Store in the U.S. in 2003 that the online music market started to gain momentum. Soon after, other major companies such as Amazon, Yahoo, Microsoft, Napster, Real, and Sony launched online music services, creating a multitude of different types of music services available to the consumers. Most of these were at first only available in the U.S. and in the larger European countries soon thereafter (U.K., Germany, and France).

Subscription services also evolved as a digital revenue source. As noted by Norman (2005), by 2005 there were two dominant models for the online distribution of music:

The most dominant business model for online distribution of music is the single track download model, often referred to as the *à la carte* download model. This model is used by market leading iTunes Music Store and other major players such as Microsoft's MSN Music and Sony's Connect service. The single track download is also the model that most resembles the traditional physical retail model, where the consumer purchases a product gaining a sense of ownership, similar to the experience of purchasing a CD. A second dominant business model is the subscription model. The most common variant of this model allows customers unlimited access to a large

catalog of music for a monthly fee. Users will then either be able to download or stream music. The nature of this model is significantly different to other models previously discussed as users do not claim ownership of any music. Subscription users are actually renting rather than owning music, and this business model represents a significant watershed in the nature of music distribution and consumer behavior. Big players in the online distribution business favoring this model are Napster and Rhapsody. There are also several examples of companies giving the customer the option of either purchasing tracks outright, or subscribing to a music service.⁴

Sources for delivery of digital music did not stop with these models. Other related models that emerged included streaming audio and video services as well as portable subscription services enabling the consumer to rent a large music catalog and play it on portable devices. Pandora, Last.fm, and Spotify sprang up in internet radio while SiriusXM (as it is now called) delivered music via satellites. For the first time in the U.S., recording artists and record labels received revenue for “air play.”⁵ This introduced new players and revenue streams in the music industry and digital performance royalties, digital aggregators, and SoundExchange were created to manage these revenues.

Other new players in the online music value chain are hardware manufacturers, internet service providers (ISPs), content portals, and mobile operators. Hardware manufacturers are not new to the music industry, but they are arguably the most active in the online music business. ISPs and content portals are new to the music value chain, offering various types of music services. Finally, with wireless technology, music is now also distributed across mobile networks, facilitated by mobile phone operators.⁶ It created new revenue streams including interactive service payments and ringtones.

Norman (2005) expresses that, “In an attempt to become triple play providers (voice, broadband, and TV/content), ISPs increasingly offer interesting music content to their customers.” One example of this type of service is offered by U.K.-based Playlouder MSP.⁷

Subscriptions led to a general change in the business paradigm from “owning” to “sharing” content, from product to service (Kusek and Leon-

hard 2005). As music access control becomes more important than music ownership control, once again, actors in the recorded music business must adapt to this change.⁸ Entities like record labels relying on only one form of distribution with high profit margins such as CDs had to rethink their business model or disappear. Unlike labels, music publishers are not as closely tied to prerecorded music sales and therefore are better suited to handle the changing ways in which consumers choose to get their music.

According to IFPI⁹ music companies and their partners have introduced many new legitimate services since 2000 to supplement traditional business models adapting to new forms of consumer demand. These include music access services, fully interoperable download stores, and advertising-supported offerings. At the same time, music companies are working to develop new revenue streams, ranging from creating value in the music experience (be it through games or merchandising products) to brand partnerships and improved broadcast and public performance rights.

Examples of “music access” models launched in 2008 and early 2009 include Nokia’s Comes With Music available in the U.K., Italy, Sweden, Singapore, and Australia; Sony Ericsson’s PlayNow service launched in Sweden as well as a service launched by local telecom TeliaSonera; Denmark’s TDC PLAY; Vodafone Spain’s unlimited music service; a music service from Finnish ISP DNA; and a number of such partnerships in France with ISPs and mobile operators including Neuf Cegetel, Orange, and SFR.¹⁰ These partnerships have capitalized on the worldwide use of smartphones to significantly help drive mobile music consumption.

Many services now offer their music catalogues free of digital rights management (DRM), allowing for interoperability between devices. Also, early 2009 marked the introduction of variable pricing in the digital download market. On iTunes, most songs cost 99 U.S. cents while some new releases cost US\$1.29 and many older catalog songs are priced at 69 cents. Similarly, Amazon and other online retailers are also offering tracks at different prices.

Music companies are working hard to monetize the rapidly growing area of social networks. A free-to-user experience business model predominates where spending by advertisers has tilted towards online platforms in the last few years. The internet accounts for about twenty percent of global advertising spending (US\$99 billion).¹¹ Increasingly, music platforms on social networks link the unlimited streaming discovery environment with purchase opportunities. Music companies open additional revenue streams

by linking “free” streaming to an easy purchase experience leading to the permanent ownership of music tracks.

Music videos remain one of the top video categories online. Over half of the top thirty most watched videos on YouTube are licensed music videos from mainstream performers such as Avril Lavigne, Chris Brown, and so forth. From this evolved the YouTube Partner Program, an ad-based revenue stream. It also led to the evolution of fan funding (also known as crowdfunding) for aspiring artists.

In April 2009 Universal Music Group (UMG) and Google partnered to create Vevo, a new music video service which is a central repository for all of UMG’s visual content such as music videos, interviews, and concert footage. YouTube provides the technology behind the service making it the first online streaming video service to syndicate the content. Negotiations to bring catalogs of other labels into the service are ongoing.

In summary, with the advent of online and satellite music distribution new income streams arose in the music industry: digital performance royalties, digital aggregators, interactive service payments, ringtones, the YouTube Partner Program, and crowdfunding. The question naturally arises, how important are they relative to existing revenue streams? Social Network Analysis methodology is employed to answer this question.¹²

Social Network Analysis Methodology and Applications

The main purpose of this study is to determine the role of new revenue agents in the digital era relative to existing players. This is accomplished by examining the strength of the relationships of the players in the music industry. Social Network Analysis (SNA) is well suited for this purpose. Because readers may not be familiar with SNA, a brief background explanation is provided.

Social Network Analysis is a methodological tool that belongs to the science of complexity. Mitchell Waldrop (1992) argues that complexity is:

[...] a subject that is still so new and wide-ranging that nobody knows quite how to define it, or even where its boundaries lie. But then, that is the whole point. If the field seems poorly defined at the moment, it is because complexity research is trying to grapple with questions that defy all conventional categories.¹³

Social Network Analysis suggests new methods for coping with evolving technologies and the evolving complexity of a dynamic competitive landscape. In the social sciences, social network analysis has become a powerful methodological tool alongside statistics. Network concepts have been defined, tested, and applied in research traditions throughout the social sciences, ranging from anthropology and sociology to business administration and history.¹⁴ SNA focuses on ties among, for example, people, groups of people, organizations, and countries. These ties combine to form networks, which are then analyzed. Social network analysts assume that interpersonal, organizational, and national ties matter because they transmit behavior, attitudes, information, or goods.¹⁵ Therefore, social network analysis offers the methodology to analyze social relations as it tells us how to conceptualize social networks and how to analyze them. The main goal of social network analysis is detecting and interpreting patterns of social ties among actors.¹⁶

Social Network Analysis is a powerful statistical tool to analyze a complex system such as the music industry. It offers a comprehensive visual output in both two- and three-dimensional forms offering depth and width perspectives. It also allows a mean to quantify relationships between all agents involved in the network. Finally, the SNA's topology provides direct information about the characteristics of network dynamics to identify descriptive as well as emerging patterns.

With respect to this study, the authors wish to understand the interrelations between all agents involved in the digital music revenue chain and assess whether control of information is correlated with control over the revenue chain as reflected by the SNA centralization measure and visual layout. To this purpose, the authors create a base model (Figure 1) identifying the agents and networks in the music industry. This is compared to an alternate model (Figure 6) coded with weighted links based on dollar value ranges to assess if the visual and/or quantifiable outputs differ significantly from the base.¹⁷

The sample data used to generate the two SNAs is represented in Table 1. The sample includes 60 *nodes* also known as *agents* or *vertices*. These nodes form a network. The nodes include revenue streams, recipients of these revenues, as well as creditors since one's revenues is another's expenses. Numbers rather than labels are used to avoid a clutter of text.

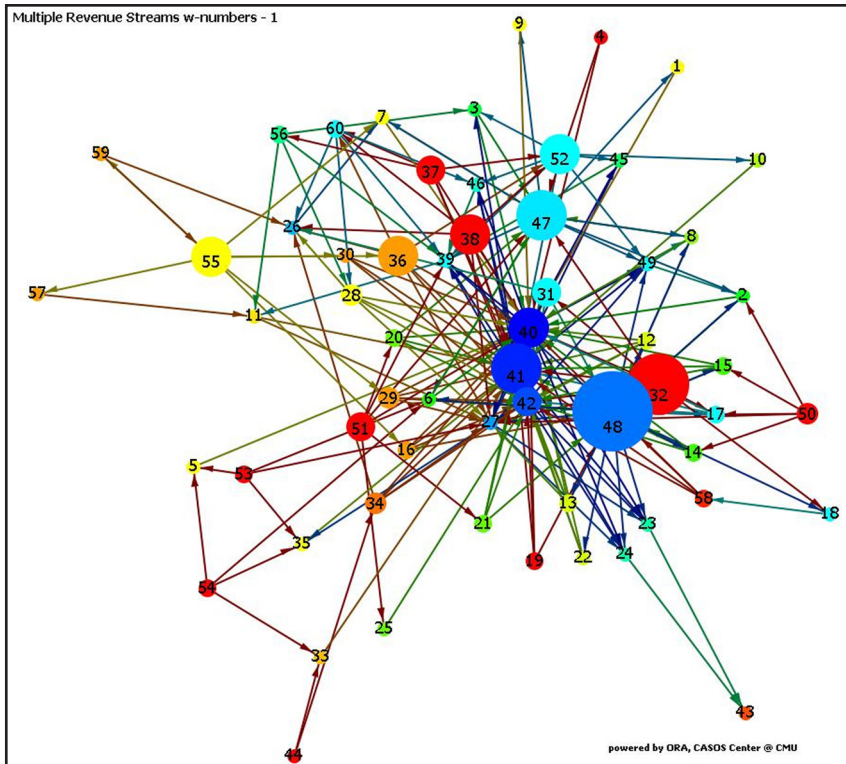


Figure 1. Social network analysis (SNA#1) representation of the financial streams in the digital era – base model.¹⁸ (The charts in this article are high resolution images that may be enlarged for detailed viewing on screen or for printing.)

Node Number	Node Label	Node Number	Node Label
1	Publisher Advance	31	YouTube Partner Program
2	Mechanical Royalties	32	Ad Revenue
3	Commissions	33	Persona Licensing
4	Public Performance Royalties	34	Product Endorsements
5	Broadcast Compositions	35	Acting
6	Synch Licenses	36	Fan Funding
7	Sheet Music Sales	37	Sponsorship
8	Ringtones	38	Grants

9	Publisher Settlement	39	Arts Administrator
10	Salary from Orchestra/ Ensemble	40	Songwriter/Composer
11	Shows/Performance Fees	41	Performer
12	Label Advance	42	Recording Artist
13	Label Support	43	Session Musician
14	Retail Sales	44	Brand
15	Digital Sales	45	Booking Fees
16	Sales at Shows	46	Representation Fees
17	Interactive Service Payments (Rhapsody, Spotify, etc.)	47	Publisher(s)
18	Digital Performance Royalties (Internet Radio, SiriusXM, Pandora)	48	Record Label
19	AARC Royalties	49	Harry Fox Agency
20	Neighboring Rights Royalties	50	Digital Aggregator
21	AFM/Secondary Markets Fund	51	Collection Societies
22	Label Settlement	52	Ensemble/Band
23	Session-Musician/Sideman Fees for Studio Work	53	Broadcasting Company
24	Session-Musician/Sideman Fees for Live Work	54	Ad Agency
25	AFM/AFTRA Payments	55	Fan/Listener/Consumer
26	Music Teacher	56	Presenter
27	Producer	57	Ticket Sales
28	Honoraria or Speakers Fees	58	SoundExchange
29	Merchandise	59	Students
30	Fan Club	60	Music Schools

Table 1. Corresponding Nodes and Labels to Figure 1.¹⁹

The coding process involved in creating an SNA is quite simple. First, each node is typed using a simple word processor such as Wordpad or a text editor (e.g., Textpad). Each node is given arbitrarily a number by the author. In our models (see Table 1) we use the following arbitrage: (1) Publisher Advance, (2) Mechanical Rights, (3) Commissions, and so

forth. Then relationships are assessed and coded as shown in the following example, which shows the ties between three nodes:

Publisher (47) gives Publisher Advance (1) to Songwriter/
Composer (40).

Our SNA models hold 221 links, thus 221 relationships shared by 60 nodes.

Once coded and processed through the graphic open-source software ORA, the music industry network is configured with the following attributes. A *capability* measure has been attributed to the sizes of the nodes. The capability measure detects entities with high or low degree relative to other entities. The formula discounts most agents having some connections and assumes a general discount to having large numbers of connections. Next, an *authority-central* measure has been attributed to the color of the nodes. A node is authority-central where its in-links are from nodes that have many out-links. Individuals and organizations that act as authorities are receiving information from a wide range of others who all send information to many others. An agent is authority-central if its in-links are from agents that are sending links to many others. Authority centrality is based on agent-by-agent matrix calculations. Finally, the links configuration is set up to show *directionality*—in this instance, the revenue flows from one agent to another.

The SNA in Figure 1 shows that content creators are most central to the network—no surprises there. Without them there would be no music industry. More importantly, the digital era content creators have now significantly more access to information, the distribution chain, and, therefore, to the revenue chain than ever before in the history of the music industry. Barriers of entry into the business of music have been significantly reduced and thus new opportunities have been created. The ever-growing flow of entrepreneurial independent artists is a perfect example of agents taking advantage of this revolution.

The authors have identified seven nodes associated with “new” revenue stream agents since 2000. These revenue streams include Ringtones (8), Interactive Service Payments (17), Digital Performance Royalties (18), YouTube Ad Revenues (31), Fan Funding also known as crowdfunding (36), Digital Aggregators (50) such as CD Baby or TuneCore, and the non-profit organization SoundExchange (58).

Note that YouTube Ad Revenues (31) and Fan Funding (36) are positioned at proximity to the content creators—Composer/Songwriter (40), Performers (41), and Recording Artists (42). Fan Funding (36) is placed at an equidistant point between the Consumers/Fans (55) and the content creators aforementioned. Services such as Kickstarter have been designed to promote the fans’ financial involvement and support of their favorite content creators’ projects.

More significant is the Ad Revenue (32) node, positioned as the single most important source of funding for services such as Spotify and Rhapsody, which are responsible for disbursing Interactive Service Payments (17) to content creators. Internet radio, SiriusXM, and Pandora, in large part also supported by ad revenue, pay out Digital Performance Royalties (18) via the non-profit company SoundExchange (58), acting as a collection society on behalf of the content creators.

Publishers (47) and Record Labels (48) still dominate the music industry. They have considerable access and control over information diffusion via all media, including social network websites such as Facebook and Twitter. In addition to owning large song and content catalogs yielding significant income, the major record labels and publishers still hold strong leverage over the digital content distribution supply chain as represented in the SNA (Figure 1).

Quantifiable Outputs and Significance

Table 2 gives us a set of basic network level measures. As mentioned earlier, SNA calculations are matrix-based and our sample data for our two SNAs (Figures 1 and 6) are 60 nodes. All subsequent numerical outputs have been generated by a 60x60 matrix as represented in Table 2, with rows and columns. Our total link count for our two SNAs is 221 and the *density* measure for both models is 0.06. The density measure shows the network’s connection strength. Assuming that all nodes are connected to all possible others ($60 \times 60 = 3,600$); the density measure would be 1.00

Measure	Value
Row count	60.000
Column count	60.000
Link count	221
Density	0.06

Table 2. Basic network level measures for SNA #1 (Figure 1).

with a maximum link count of 3,600. In a network with a density of 1.00 all agents/nodes would be equidistant from the center of that network. Therefore, our density measure of 0.06 means that only 6% of 3,600 possible links are represented in the SNA ($221 / 3,600 = 0.06$). This indicates that a few agents (nodes) within the network significantly dominate many others. Please refer to Figure 2 for a list of the most influential agents from the capability measure perspective. To recapitulate, the capability measure detects entities with high or low degree relative to other entities. The formula discounts that most agents have some connections and assumes a general discount for large numbers of connections. Figure 2 depicts a node size ranking from larger to smaller for the 24 largest nodes derived from Figure 1.

Table 3 is our analysis reference point. This table contains a node ranking in the left column based upon the output given by the total degree centrality metric, which is a combination of in-links+out-links, shown in the right column. This metric represents the link count associated with the node listed to its left also known as *source node*. Therefore, Table 3 indicates the potential for each agent represented to “cash in” on the commercial value of music as well as “pay out” revenues due to other agents as based upon their industry network position, thus, their total level of involvement within the industry.

Rank	Source Nodes	Unscaled
1	Songwriter/Composer	37.000
2	Performer	33.000
3	Label	28.000
4	Recording Artist	27.000
5	Producer	19.000
6	Publisher(s)	16.000
7	Arts Administrator	12.000
8	Ensemble/Band	10.000
9	Ad Revenue	9.000
10	Teacher	8.000
11	Fan (Crowd) Funding	8.000
12	Harry Fox Agency	8.000
13	Fan/Listener/Consumer	8.000
14	Synch Licenses	7.000

15	Interactive Service Payments	7.000
16	Honoraria or Speakers Fees	7.000
17	YouTube Partner Program	7.000
18	Grants	7.000
19	Music Schools	7.000
20	Mechanical Royalties	6.000
21	Ringtones	6.000
22	Retail Sales	6.000
23	Digital Sales	6.000
24	Session Musician/Sideman Fees for Studio Work	6.000
25	Session Musician/Sideman Fees for Live Work	6.000
26	Merchandise	6.000
27	Product Endorsements	6.000
28	Sponsorship	6.000
29	Representation Fees	6.000
30	Collection Societies	6.000
31	Commissions	5.000
32	Sheet Music Sales	5.000
33	Shows/Performance Fees	5.000
34	Label Advance	5.000
35	Label Support	5.000
36	Sales at Shows	5.000
37	Neighboring Rights Royalties	5.000
38	AFM/Secondary Markets Fund	5.000
39	Digital Aggregator	5.000
40	Presenter	5.000
41	SoundExchange	5.000
42	AARC Royalties	4.000
43	Label Settlement	4.000
44	Fan Club	4.000
45	Acting	4.000
46	Booking Fees	4.000
47	Broadcasting	4.000
48	Ad Agency	4.000
49	Broadcast Compositions	3.000
50	Digital Performance Royalties	3.000

51	Persona Licensing	3.000
52	Students	3.000
53	Publisher Advance	2.000
54	Public Performance Royalties	2.000
55	Publisher Settlement	2.000
56	Salary from Orchestra/Ensemble	2.000
57	AFM/AFTRA Payments	2.000
58	Session Musician	2.000
59	Brand	2.000
60	Ticket Sales	2.000
Mean: 0.062		
Std. Dev.: 0.061		

Table 3. Node ranking output for the SNA #1 (Figure 1).

Table 3 confirms the network connection importance of recognized music business members. Songwriters, performers, record labels, and publishers maintain dominant rankings. However, the newly created agents seem positioned to capitalize on music revenue streams. From those, crowdfunding has the highest rank (11) with a total degree centrality of 8.00. This is probably because of the ease of use and access to this service by all artists and their fans worldwide. It may partially displace the traditional music publisher and the role of record labels.

Interactive service payments and the YouTube Partner Program are tied with a total degree centrality of 7.00 and seem to outrank digital performance royalties (rank 50). However, digital performance royalties are being disbursed by SoundExchange (rank 41). Thus, if we add up the total degree centrality of both nodes minus one common link we get: $5.00 + 3.00 - 1.00 = 7.00$. That calculation gives us an adjusted value, placing digital performance royalties at the same metric level as the interactive service payments (ISPs) and the YouTube Partner Program. Note that all artists have access to services such as Spotify and YouTube, but digital performance revenues from companies such as Pandora Radio and SiriusXM Radio are only open to invited artists, creating a barrier of entry to many mid-level artists.

Ringtones rank in the top half (rank 21) with a total degree centrality

of 6.00. Finally, the digital aggregators rank 39 with a total degree centrality of 5.00. However, digital aggregators are responsible for disbursing the interactive service payments and should yield a higher ranking following the same logic used previously with SoundExchange and digital performance royalties: $5.00 + 7.00 - 1.00 = 11.00$. This adjusted metric (11.00) would place the interactive service payments/digital aggregator bundle in a leading spot within our current model—hypothetically ranking in eighth position behind the “arts administrators” node.

The digital recording era “new” revenue streams seem to hold strong positions within our model (Figure 1). Based on their network ranking, ISPs/digital aggregators are in leading position (11.00) followed by crowd-funding (8.00), the YouTube Partner Ad Program (7.00) tied with the digital performance royalties/SoundExchange (7.00) and ringtones (6.00). All seven outrank entrenched traditional revenue streams such as fees from students, public performance royalties, and ticket sales. Before the advent of the digital era, record labels and music publishers monopolized the economic activity of the music business. Our model shows that the “new” revenue streams have the potential to undermine that dominance.

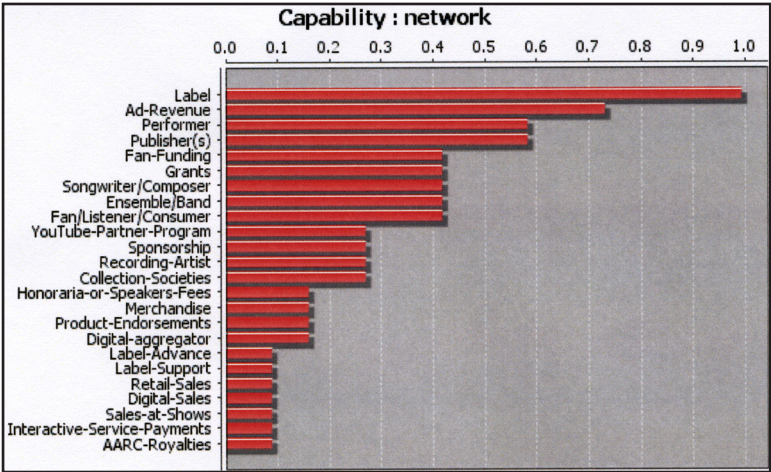


Figure 2. Capability measures for nodes for SNA #1.

SNA Model with Weighted Links and Significance

To ascribe economic value to the various agents in our second SNA, we assess international and domestic revenue streams to formulate three

broad dollar value ranges. One trusted source for collecting such data is the International Federation of the Phonographic Industry (IFPI). Figure 3 shows the impact of the music industry on its secondary markets such as video game sales, music TV & magazine advertising revenue, portable digital players, and audio home systems. In 2011 the rough estimate of the value of the global music industry (including secondary markets) was US\$167.7 billion. However, only about \$67.6 billion accounted for its primary market revenues as shown in Figure 5.

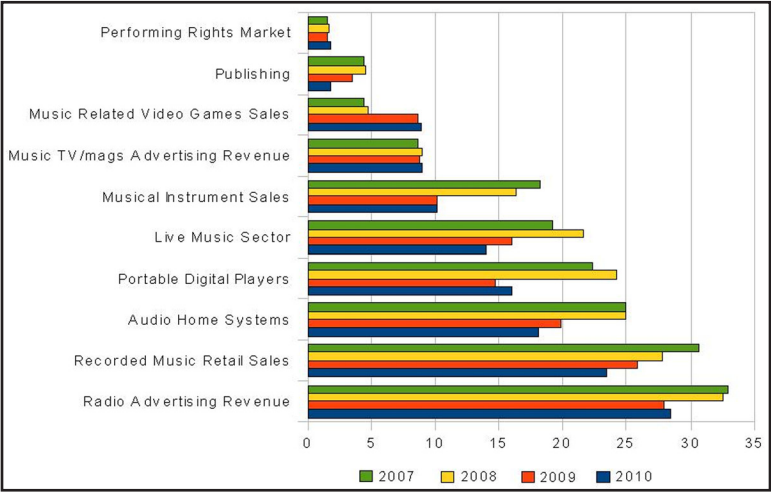


Figure 3. The broader music industry value in US\$ Billions. (2007-2010). Source: IFPI 2008 & 2011 Reports.

A solid source of domestic revenue information is the Recording Industry Association of America (RIAA). Figure 4 shows music retail and digital sales trends in the United States from 1983 to 2010 by format and in billions of dollars. Note the decline of CD sales revenues reaching a pivotal point around the year 2000 and the start of the displacement phenomena by digital performance royalties, subscription models, mobile formats, music download capability (single and albums), and videos. This coincides with the appearance of the seven “new” music industry revenue streams identified in this study.

A third source of industry revenue information is eMarketer. Again, the revenues of the global music industry account for about US\$67.6 billion but recorded music revenues only add up to about half of that estimate

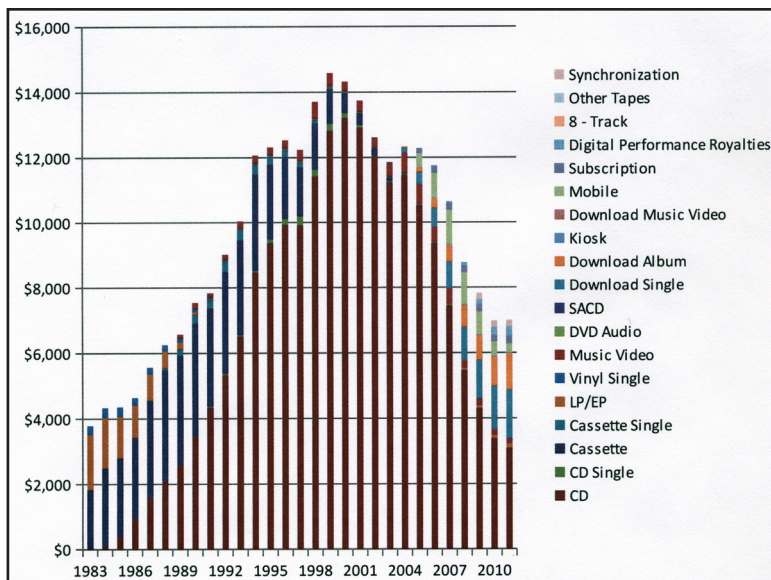


Figure 4. U.S. recorded sales (1983-2010) by format in US\$ Billions. Source: RIAA 2011 report. (The charts in this article are high resolution images that may be enlarged for detailed viewing on screen or for printing.)

(Figure 5). All revenue subsets in Figure 5 have been gradually increasing—with the exception of physical format sales—showing the overall healthy state of the music industry.

Information collected from the aforementioned sources was mined to weight the economic importance of the various players (nodes) in our alternative model, SNA#2 (Figure 6). The attributes and methodology used to generate Figure 6 are identical to Figure 1 except for how the links were treated. The code used to generate Figure 6 and subsequently the output in Table 6 has been modified. Weighted links attributes have been assigned arbitrarily, ranging from 1 to 3 for SNA#2 with 1 being least relevant and 3 being the most relevant from an economic perspective. Attributes have been based on the results of Figures 3, 4, and 5. Weight 1 represents assessed values of less than \$10 billion, weight 2 represents assessed values in between \$10 billion and \$20 billion, and weight 3 accounts for assessed values greater than \$20 billion. Table 4 summarizes the assigned weights. There is no distinction of weight within one specific link, disregarding directionality, thus, the same weight is assigned to its in-link and out-link.

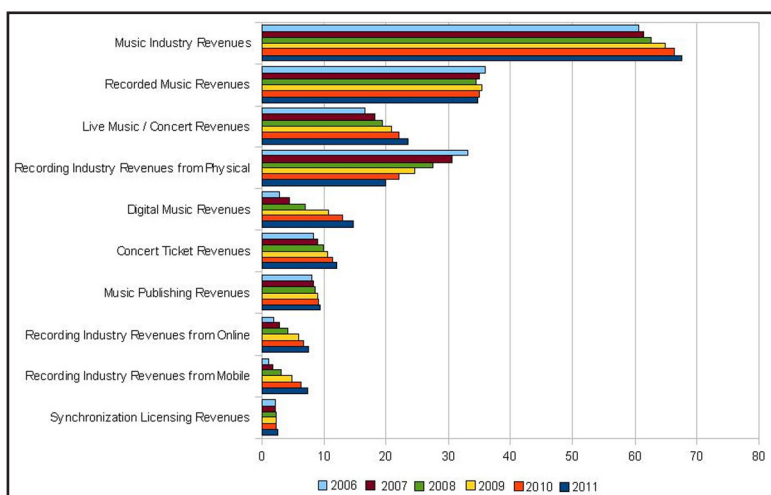


Figure 5. Global music industry revenues in US\$ Billions (2006-2011). Source: *eMarketer*. (The charts in this article are high resolution images that may be enlarged for detailed viewing on screen or for printing.)

Note that the weights are not assigned to the nodes themselves but only the links generated by each node.

There is no significant visual change in Figure 6 besides a slight reorganization of the model. The capability measure is not altered by the weighted links. Therefore, the size of the nodes does not change. Thus, our base model still remains robust. Our second step is to analyze the nodes ranking output in Table 6 and to interpret the actual statistical changes.

Node Number	Node Label	Weight	Node Number	Node Label	Weight
1	Publisher Advance	1	31	YouTube Partner Program	1
2	Mechanical Royalties	1	32	Ad Revenue	3
3	Commissions	1	33	Persona Licensing	1
4	Public Performance Royalties	1	34	Product Endorsements	1
5	Broadcast Compositions	1	35	Acting	1
6	Synch Licenses	1	36	Fan Funding	1

7	Sheet Music Sales	1	37	Sponsorship	1
8	Ringtones	1	38	Grants	2
9	Publisher Settlement	1	39	Arts Administrator	3
10	Salary from Orchestra/ Ensemble	3	40	Songwriter/ Composer	3
11	Shows/ Performance Fees	3	41	Performer	3
12	Label Advance	1	42	Recording Artist	3
13	Label Support	1	43	Session Musician	3
14	Retail Sales	3	44	Brand	1
15	Digital Sales	2	45	Booking Fees	1
16	Sales at Shows	2	46	Representation Fees	1
17	Interactive Service Payments (Rhapsody, Spotify, etc.)	1	47	Publisher(s)	1
18	Digital Performance Royalties (Internet Radio, SiriusXM, Pandora)	1	48	Record Label	3
19	AARC Royalties	1	49	Harry Fox Agency	1
20	Neighboring Rights Royalties	1	50	Digital Aggregator	3
21	AFM/Secondary Markets Fund	1	51	Collection Societies	1
22	Label Settlement	1	52	Ensemble/Band	3
23	Session-Musician/ Sideman Fees for Studio Work	2	53	Broadcasting Company	3
24	Session-Musician/ Sideman Fees for Live Work	2	54	Ad Agency	3
25	AFM/AFTRA Payments	1	55	Fan/Listener/ Consumer	3
26	Music Teacher	3	56	Presenter	3
27	Producer	3	57	Ticket Sales	2
28	Honoraria or Speakers Fees	1	58	SoundExchange	1
29	Merchandise	2	59	Students	3

30	Fan Club	1	60	Music Schools	3
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Table 4. Corresponding nodes and labels with weights (links only) for figure 2.

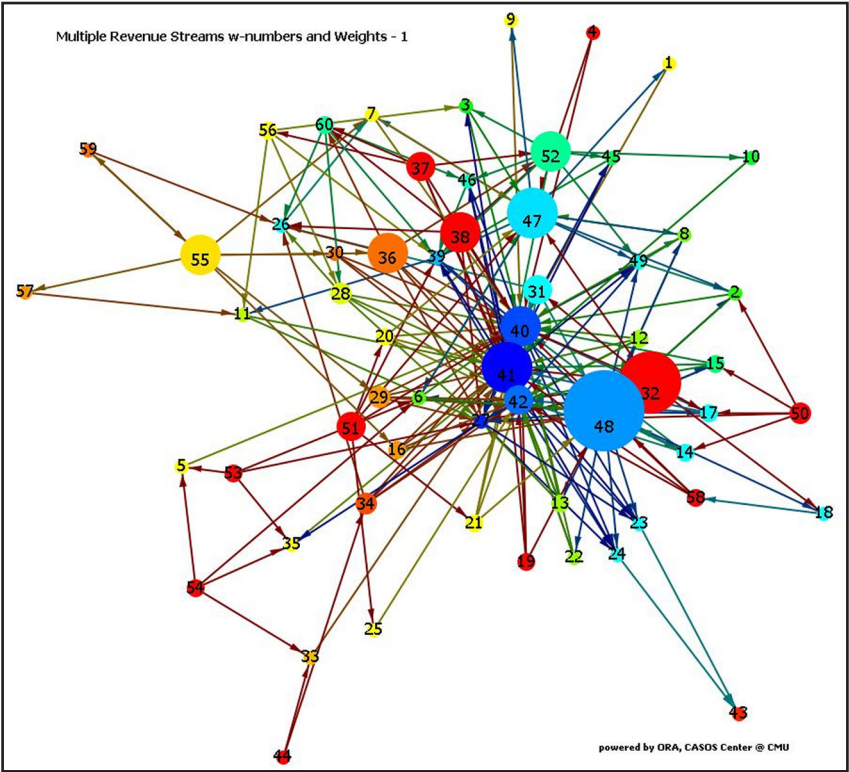


Figure 6. Social network analysis (SNA #2) representation of the financial streams in the digital era – weighted model. (The charts in this article are high resolution images that may be enlarged for detailed viewing on screen or for printing.)

Measure	Value
Row count	60.000
Column count	60.000
Link count	221
Density	0.06

Table 5. Basic network level measures for SNA #2 (Figure 6).

Rank	Source Nodes	Unscaled
1	Performer	53.000
2	Songwriter/Composer	51.000
3	Label	44.000
4	Recording Artist	41.000
5	Producer	39.000
6	Arts Administrator	36.000
7	Ad Revenue	27.000
8	Publisher(s)	20.000
9	Retail Sales	18.000
10	Ensemble/Band	17.000
11	Shows/Performance Fees	14.000
12	Grants	14.000
13	Teacher	13.000
14	Digital Sales	12.000
15	Session Musician/Sideman Fees for Studio Work	12.000
16	Session Musician/Sideman Fees for Live Work	12.000
17	Merchandise	12.000
18	Music Schools	12.000
19	Fan/Listener/Consumer	11.000
20	Sales at Shows	10.000
21	Digital Aggregator	10.000
22	Interactive Service Payments	9.000
23	YouTube Partner Program	9.000
24	Presenter	9.000

25	Fan (Crowd) Funding	8.000
26	Representation Fees	8.000
27	Harry Fox Agency	8.000
28	Collection Societies	8.000
29	Synch Licenses	7.000
30	Honoraria or Speakers Fees	7.000
31	Mechanical Royalties	6.000
32	Ringtones	6.000
33	Salary from Orchestra/Ensemble	6.000
34	Product Endorsements	6.000
35	Sponsorship	6.000
36	Booking Fees	6.000
37	Broadcasting	6.000
38	Commissions	5.000
39	Sheet Music Sales	5.000
40	Label Advance	5.000
41	Label Support	5.000
42	Digital Performance Royalties	5.000
43	Neighboring Rights Royalties	5.000
44	AFM/Secondary Markets Fund	5.000
45	SoundExchange	5.000
46	Students	5.000
47	AARC Royalties	4.000
48	Label Settlement	4.000
49	Fan Club	4.000
50	Acting	4.000
51	Session Musician	4.000
52	Ad Agency	4.000
53	Ticket sales	4.000
54	Broadcast Compositions	3.000
55	Persona Licensing	3.000
56	Publisher Advance	2.000
57	Public Performance Royalties	2.000
58	Publisher Settlement	2.000
59	AFM/AFTRA Payments	2.000
60	Brand	2.000

Mean: 0.032
Std. Dev.: 0.034

Table 6. Node ranking output for the SNA #2 (Figure 6).

Ranks in Table 6 differ significantly from Table 3 and most “unscaled” (total degree centrality) values in Table 6 are larger than corresponding nodes in Table 3. This is because the unscaled values in Table 3 did not have weights assigned to their links, therefore, the value for each link was 1. In Table 6 (and corresponding Figure 6) the unscaled values and node rankings have been altered because links have been assigned a weight of 1, 2, or 3, thus, the total degree capability for most links has been multiplied by two or three.

When compared to Table 3, the results of Table 6 indicate very little shift among traditional players in our network representation of the music business. Songwriters, performers, record labels, and publishers are once again in a prominent position within the network. When weighted for their economic importance, most of the new revenue sources rank lower. Interactive service payments drop to 22nd from 15th, YouTube Partner Ad Program drops from 23rd to 17th, crowdfunding drops from 11th to 25th, ringtones drop from 21st to 32nd, and SoundExchange moves from 41st to 45th. Two of the new revenue sources perform better than their network connections indicate. Digital aggregators/interactive service payments rank 18th when adjusted for economic impact ($10.00 + 9.00 - 1.00 = 18.00$) and digital performance royalties/SoundExchange ($5.00 + 5.00 - 1.00 = 9.00$) ties with the YouTube Partner Ad Program node. The following paragraphs discuss why rank changes may have occurred.

The top ranking “new” (unbundled) revenue stream is the digital aggregator (21) (CD Baby, TuneCore, etc.). This seems appropriate since these services are responsible for distributing digital content via several platforms (digital and physical sales as well as interactive service payments). The interactive service payments (22) and YouTube ad revenues (23) are listed ahead of digital performance royalties (42). This is understandable because the payout rates for Spotify (0.96 cents per song streamed) and the YouTube ad revenues (0.25 to 0.50 cents per video streamed) are significantly higher than those offered by Pandora (0.11

cents per song streamed). Also, crowdfunding (25) has produced a wide-spread impact in the music community. Ringtones (32) are again in last position behind crowdfunding (25), perhaps because ringtones are not a source of music listening per se, but rather an enhanced cell phone feature.

Table 7 presents the summary of our analysis. We notice several changes once the revenue flows (links) in the network have been assigned weights (dollar value ranges). The most noticeable difference is the rise of the digital performance royalties/SoundExchange bundle ahead of the YouTube Partner Ad revenues and crowdfunding. Ringtones stay in last position in our ranking. Another significant change is the overall backward shift of all the rankings in our second SNA model. This shift informs us that the “new” revenue sources have not yet achieved their full economic potential but are already well positioned to undermine the dominance of the more traditional revenue streams.

Conclusion

Accompanying the growing popularity of digital/satellite music distribution since 2000, various new methods of delivering prerecorded mu-

SNA #1 Base Model		
Nodes	Adjusted Unscaled	Adjusted Ranking
Digital Aggregators/Interactive Service Payments	11.00	6
Crowdfunding	8.00	11
Digital Performance Royalties/SoundExchange	7.00	15
Youtube Partner Ad Revenues	7.00	15
Ringtones	6.00	22
SNA #2 Model with Weighted Links		
Nodes	Adjusted Unscaled	Adjusted Ranking
Digital Aggregators/Interactive Service Payments	18.00	9
Digital Performance Royalties/SoundExchange	9.00	23
Youtube Partner Ad Revenues	9.00	23
Crowdfunding	8.00	26
Ringtones	6.00	32

Table 7. Comparative analysis for SNA #1 (Figure 1) and SNA #2 (Figure 6) with adjusted unscaled values and corresponding rankings.

sic have evolved: downloading, subscription services, streaming, satellite radio, and ringtones. This paper examines for the first time the relative importance of the revenue streams engendered by these changes by analyzing seven new revenue streams that have appeared since 2000 (digital aggregators, interactive service payments, the YouTube Partner Program, crowdfunding, ringtones, digital performance royalties, and SoundExchange).

This study is the first of its kind to assess the relevance of the revenue streams from a network perspective. With the use of Social Network Analysis (SNA), we present the music industry community with a quantifiable output solution to investigate complex relationships organized in a cardinal, ordinal, and nominal format. In addition, Social Network Analysis is a non-linear computational statistical tool that generates two- as well as three-dimensional visual outputs. It enables scholars to generate quantifiable validation to issues previously left to debate.

Two models and corresponding outputs have been created for this study. The outputs for both models indicate the potential for each agent represented to “cash in” on the commercial value of music as well as “pay out” revenues due to other agents as based upon their industry network position, thus, their total level of involvement within the industry. Both models have a low density measure, which indicates that a few agents (nodes) within the network significantly dominate many others. The first model (SNA#1, Figure 1 and Table 3) identifies the principal agents within a network representing the global music industry and has the advantage to isolate all current economic data from a bias analysis that may prove more accurate should recent economic trends not continue. This model offers a robust perspective on the interrelationships of a sample data of sixty agents (nodes) within the industry. Similarly to the banking industry, the control of and access to information and distribution channels is imperative for success in the music industry. The digital era content creators have now significantly more access to information, the distribution chain, and, therefore, to the revenue chain than ever before in the history of the music industry. Barriers of entry into the business of music have been significantly reduced and thus new opportunities have been created. Our model offers for the first time an integrated network perspective, showing clearly which members in the network dominate the industry.

The authors’ intent in our second model (SNA#2, Figure 6 and Table 6) was to assess whether visual and/or quantifiable outputs differed sig-

nificantly from the base model when a value was given to each revenue stream. When weighted for their economic impact, the digital aggregators/interactive service payments bundle, digital performance royalties/SoundExchange combination, the YouTube Partner Program, and crowdfunding rank in the top half of networked relationships in the music industry. These findings attest to the commercial appeal of distributing digital content through several platforms (digital and physical sales as well as services such as Spotify, Rhapsody, Pandora, and SiriusXM Radio), YouTube's popularity, and the willingness of music consumers to invest in favored artists. Although not ranked in the top half of network relationships, ringtones, still represent a significant revenue source. In the future, the economic value of the "new" and high potential sources of prerecorded music revenue may match the rank location of the currently more prominent traditional revenue generating agents in the music industry.

Endnotes

1. The MP3 algorithm, invented and patented by Fraunhofer IIS, generates millions of dollars annually for the benefit of the Fraunhofer society. More recently Fraunhofer has invented the H.264/MPEG-4 AVC video compression standard. Accessed June 1, 2013. http://en.wikipedia.org/wiki/Fraunhofer_Society.
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3. Rosabeth Moss Kanter, "Innovation: The Classic Traps," *Harvard Business Review* 84, no. 11 (2006): 72-83, 154.
4. Håkon Normann, "Digital Distribution of Music: The Role of Networks and Knowledge in the Norwegian Recorded Music Industry" (masters thesis, Faculty of Social Sciences, University of Oslo, Norway, 2005).
5. In the United States, songwriters and music publishers have always received royalties from terrestrial radio broadcasts, but recording artists and record labels have not. With the advent of the internet and satellite radio, legislation was passed granting royalties to both sets.
6. Håkon Normann, "Digital Distribution of Music: The Role of Networks and Knowledge in the Norwegian Recorded Music Industry" (masters thesis, Faculty of Social Sciences, University of Oslo, Norway, 2005).
7. Ibid.
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10. Ibid.
11. GroupM, "Global internet ad spend hit \$99bn in 2012, almost 20% of total investment," March 27, 2013, accessed June 1, 2013. <http://www.wpp.com/wpp/press/2013/mar/27/global-internet-ad-spend-hit-99bn-in-2012/>.
12. For an in-depth discussion of Social Network Analysis methodology see Stanislas Renard, Peter Spang Goodrich, and Philip Vos

- Fellman, "Historical Changes in the Music Industry Supply Chain: A Perception of the Positioning of the Artist Musician," *Journal of the Music & Entertainment Industry Educators Association* 12, no.1 (2012), accessed June 1, 2013. <http://meiea.org/Journal/Vol.12/Renard-Goodrich-Fellman-2012-MEIEA-Journal-Vol-12-No-1-p91.pdf>.
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 15. Ibid.
 16. For an in-depth discussion of Social Network Analysis methodology see Stanislas Renard, Peter Spang Goodrich, and Philip Vos Fellman, "Historical Changes in the Music Industry Supply Chain: A Perception of the Positioning of the Artist Musician," *Journal of the Music & Entertainment Industry Educators Association* 12, no.1 (2012), accessed June 1, 2013. <http://meiea.org/Journal/Vol.12/Renard-Goodrich-Fellman-2012-MEIEA-Journal-Vol-12-No-1-p91.pdf>.
 17. Social Network Analysis representations via SNA open source software ORA designed by K. M. Carley, copyrights 2001-2011. Center for Computational Analysis of Social and Organizational Systems (CASOS), School of Computer Science, Carnegie Mellon University.
 18. Ibid.
 19. Recording artist and the session musician differ regarding compensation. Session musicians do not receive Label Support.

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