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Historical Changes in the Music Industry Supply Chain: A Perception of the Positioning of the Artist Musician

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Abstract

The present study will explore the historical changes of the music industry supply chain. It will consider propositions such as the vertical integration of the historical music industry, the revolution in technology, and the positioning of the artist within the music industry supply chain.

Several questions will be tackled: What is the positioning of the artist in the new digital era? And given the changes of position of the major labels and the positioning of the artist, what are the descriptive and prescriptive possibilities should the majors disappear and be replaced by alternative elements in the music industry supply chain?

Social Network Analysis (SNA) will be utilized as a methodological tool in the creation of non-linear and adaptive models.

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

Introduction

This study's primary focus is an historical analysis of the international music industry supply chain. It wishes to understand old business mod-

els to reflect upon new ones. The work presented builds upon the seminal work of Renard's (2010) doctoral dissertation entitled "Unbundling the Supply Chain for the International Music Industry."[1]

Let us consider that the physical distribution chain becomes less and less important. Also, as other players find it easier to enter the market, an inevitable shift in revenue streams forces the record labels into new directions and new strategic positioning. Finally, how does that affect the positioning of the social agent responsible for the value-added quality within the music supply chain: namely, the artist.

Hagel and Singer (1999) argue that when a vertically integrated industry goes through a major change such as the one experienced by the music industry with the digitization of music, it opens the door to the profitable creation of many new specialized companies. The more established generalist firms, the three "majors" (Sony Music Entertainment, Universal Music Group, and Warner Music Group) have advantages of size, reputation, and integration. Now, these advantages are beginning to wither. The new advantages—creativity, speed, flexibility—belong to the specialists (independent labels and the artist).[2] They explain that *interaction costs* represent the money and time that are expanded whenever people and companies exchange goods, services, or ideas.[3]

Interaction costs have been popularly used in the development of a general network theory for social sciences. This approach has been used to illuminate the shaping of networks and the interactions within them. The same set of concepts can be applied to the world of outsourcing to illustrate the overheads associated with adding incremental supplier/vendor relationships to an existing set of dynamics for an organization.

Acemoglu, Aghion, Griffith, and Zilibotti (2004) affirm that many experts believe that recent technological developments and globalization are transforming the internal organization of the firm. They present two views which are of interest in the present study. First, they explain that new technologies, especially information technology, are creating a shift from the old integrated firms towards more delayered organizations and outsourcing. Second, they explain that, "it is often maintained that the greater competitive pressures by both globalization and advances in information technology favor smaller firms and more flexible organizations that are more conducive to innovation."[4] However, the economics profession is still far from a consensus on the empirical determinants of vertical integration in general, and about the relationship between technological

change and vertical integration in particular.

Why, then, would the majors also seek to horizontally integrate if they already own more than eighty percent of the industry? We have to consider that these large companies are also competing against each other. To do this, they must each find an unconquered niche within the music industry and try to secure it for themselves. They might do this by specializing in one genre of music such as country music or by conquering a new market in a new country.

Our social network analysis (SNA) confirms that by buying all the labels in a certain genre or by establishing another distribution channel in a rising market, these large companies can maintain a competitive advantage over their competitors. By owning more parts of the supply chain, they can make even more profits by narrowing the costs of production. SNA statistically analyzes social networks in a methodical way using graphical social network diagrams. It looks at social relationships using network theory where nodes (representing individual actors within the network) are represented as points and ties (representing relationships between the individual actors) are represented as lines.[5]

The "Property Right Theory" approach, on the other hand, focuses on the role of ownership of assets as a way of allocating residual rights of control, and emphasizes both the costs and the benefits of vertical integration in terms of *ex ante* investment incentives. Considering a relationship between a supplier (upstream firm) and a producer (downstream) and supposing that only two organizational forms are possible where vertical integration (backward) occurs when the downstream producer buys up the upstream supplier and has residual rights of control, and non-integration (outsourcing) which occurs when the producer and the supplier are different firms.

Over the last two decades the "Transaction Cost Theory" has emerged as a major paradigm in the academic literature. Williamson (1975,[6] 1985[7]) has made the most influential statements about this theory inspiring new research regarding the configuration of organizational form, diversification, vertical integration, foreign direct investment, joint ventures, and business-level activities.

However, bundling into a single corporation inevitably forces management to compromise the performance of each process in ways that no amount of re-engineering can overcome.[8] This has been the strategy carried out by the majors in the music industry.

There are other reasons for this vertical integration besides increased market share. These mammoth conglomerates in the music industry known as the majors have over the past one hundred years created a tightly secured network by purchasing forwards and backwards in the supply chain, buying new labels, manufacturing companies, and distributing companies. Their established distribution systems have become highly elaborate and expensive creating a barrier to entry within the industry. No small firms can enter and compete because it is too difficult and costly to get established to compete against the majors. Therefore, the majors maintain a competitive advantage by being able to dominate and control the industry due to economic barriers to entry.

Under the pressures of dealing with non-standardized copyright laws throughout the world, global competition, and advancing technology, many industries (and the music industry in particular) are already fracturing along the fault lines of customer relationship management, product innovation, and infrastructure management.

The major record companies are in the process of unbundling but are not ready for rebundling quite yet. As infomediaries[9] rise to power, many traditional companies will find themselves cut off from their customers. There is a serious threat that new technologies may bring to bear on existing music technologies through the process of substitution, creating a possible shift in power.

But what did the music industry look like before the major record labels existed?

Methodology

Social Network Analysis[10]

Social network analysis (SNA) 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.[11]

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.[12]

Social network analysis 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 ties matter, as do ties among organizations and countries, because they transmit behavior, attitudes, information, or goods.[13] 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.

The basis of social network visualization was laid by researchers who called themselves sociometrists. Their leader, J. L. Moreno, founded a social science called sociometry,[14] which studies interpersonal relations. Society, they argued, is not an aggregate of individuals and their characteristics, as statisticians assume, but a structure of interpersonal ties. Therefore, the individual is not the basic social unit. The social atom consists of an individual and his or her social, economic, or cultural ties. Social atoms are linked into groups, and, ultimately, society consists of interrelated groups.

Ten different SNAs are presented in this paper. SNA is an extension of graph theory. A graph is a set of vertices (also called points or nodes) and a set of lines where each line connects two vertices, therefore representing the structure of a network.

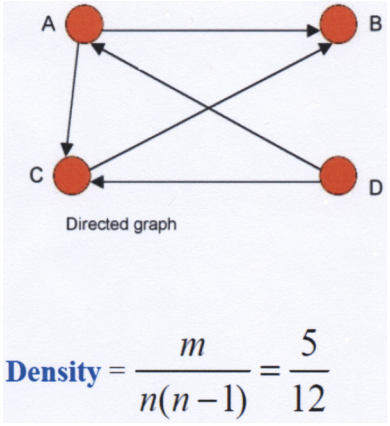
A vertex is the smallest unit in a network and represents an actor (record company, artist…) and is usually represented by a number.

A line which is a tie between two vertices in a network represents the social relation between those two vertices. That line may be directed or undirected. The SNAs presented below are all directed graphs where a directed line is also named an arc.

Formally, an arc is an ordered pair of vertices in which the first vertex is the sender and the second is the receiver (e.g., revenue flows). A network consists of a graph and additional information on the vertices or

the lines of the graph. In the SNAs presented in the following section, the names of the nodes represent the additional information on the vertices. The lines of our networks have all equal value (meaning a value of one) and have no preferential choice regarding which node to go to first. Line values usually indicate the strength of a relation. Again, the lines in our SNAs have all equal strength of relation.

Next, some of the most important definitions of measures regarding the statistical analysis of a network are explained. First of all, cohesion implies that a social network contains many ties, and as more ties between agents yield to a tighter structure, it therefore leads to more cohesiveness. In SNA this notion is captured in the density measure. The density is the number of lines in a network, expressed as a proportion of the maximum possible number of lines. A network in which all pairs of vertices are linked by two arcs, one in each direction is considered to be a network with maximum density, or a complete network (see Graph 1).



Graph 1. Example of a density measure based on the directed graph shown above.

According to Nooy, Mrvar and Batagelj (2005)[15] network density is not very useful because it depends on the size of the network:

> Density is inversely related to network size: the larger the social network, the lower the density because the number of possible lines increases rapidly with the number of ver-

> tices, whereas the number of ties which each agent can maintain is limited.[16]

They argue that it is better to look at the number of ties in which each vertex is involved. This is called the degree of a vertex. They explain that a higher degree of vertices yields a denser network, because vertices entertain more ties. Therefore, the average degree of all vertices can be used to measure the structural cohesiveness of a network. According to Nooy, Mrvar and Batagelj, this is a better measure of overall cohesion than density because it does not depend on network size, so average degree can be compared between networks of different sizes. Also the "indegree" of a vertex is the number of arcs it receives and the "outdegree" is the number of arcs it sends.

However, besides the useful analysis of the degree of various vertices, we believe that density measures are relevant in the present study because most of the networks presented are relatively of a comparable size.

Most social networks contain people or organizations that are central. Because of their position, they have better access to information and better opportunities to spread information. This is known as the ego-centered approach to centrality. Viewed from a socio-centered perspective, the network as a whole is more or less centralized. Centrality refers to the position of individual vertices within the network, whereas centralization characterizes an entire network.

Nooy, Mrvar, and Batagelj tell us that:

> A network is highly centralized if there is a clear boundary between the center and the periphery. In a highly centralized network, information spreads easily but the center is indispensable for the transmission of information.

For example, the larger the number of sources accessible to a person, the easier it is to obtain information. The importance of a vertex to the circulation of information is captured by the concept of betweenness centrality. High betweenness centrality indicates that a person is an important intermediary in the communication network. Information chains are represented by geodesics (the shortest path between two vertices) and the betweenness centrality (the variation in the degrees of vertices divided by the maximum degree variation which is possible in a network of the same

size) of a vertex is simply the proportion of geodesics between pairs of other vertices that include the vertex.

The centralization of a network is higher if it contains very central vertices as well as very peripheral vertices. Network centralization can be computed from the centrality scores of the vertices within the network where more variation in centrality scores means a more centralized network.

Scenario Planning

Chermack, Lynham, and Ruona (2001) tell us that:

> Uncertainty has become an important factor for business leaders and planners to consider. In such a rapidly changing business environment, the ability to adapt quickly to major changes can mean the difference between a thriving business and bankruptcy. These changes are often external to the organization, and coping with them has forced managers and executives to adopt a systems view of business. With global complexities and changes likely to continue on the current path of growth, the future of the global business environment will require an even more thorough ability to examine the forces of change and anticipate possible solutions to potential problems. A well known method for coping with future changes in organizations has been strategic planning.[17]

According to Cummings and Worley (2001), because organizations are open systems, they must strive to achieve the best possible fit with the external environment.[18] As Schoemaker (1995) wrote, "Scenario planning is a disciplined method for imagining possible futures that companies have applied to a great range of issues."[19]

Scenario planning has proven to be an effective tool for identifying critical future uncertainties and investigating "blind spots" in the organizational structure. It is in large part an adaptation and generalization of classic methods used by military intelligence.

According to Schoemaker (1995):

> Scenarios are more than just the output of a complex simulation model. Instead they attempt to interpret such output by identifying patterns and clusters among the millions of possible outcomes a computer simulation might generate. They often include elements that were not or cannot be formally modeled, such as new regulations, value shifts, or innovations. Hence, scenarios go beyond objective analyses to include subjective interpretations.[20]

Scenario planning may involve aspects of complex systems thinking, specifically the recognition that many factors may combine in complex ways to create sometime surprising futures. Schoemaker (1995) explains that scenario planning tries to compensate for "underprediction and overprediction of change" as regard to decision making. He also supports that scenario planning helps expand the range of possibilities we can see, while avoiding a drift into "unbridled science fiction" by dividing our knowledge into three distinct areas:

1. Elements we know we know
2. Elements we know that we don't know
3. Elements that fit into the area of uncertainty (elements that we don't know that we don't know)

Systems thinking used in conjunction with scenario planning, leads to plausible scenario story lines because the causal relationship between factors can be demonstrated. In these cases when scenario planning is integrated with a systems thinking approach to scenario development, it is sometimes referred to as structural dynamics.

Schoemaker (1995) identifies ten steps for constructing scenario planning:

1. Definition of the scope
2. Identification of the different stakeholders
3. Identification of the basic trends
4. Identification of the basic uncertainties
5. Construction of the initial scenario theme
6. Checking for consistency and plausibility
7. Developing learning scenarios

8. Identification of research needs
9. Developing a quantitative model
10. Evolving towards decision scenarios

This study attempts to combine social network analysis and scenario planning to construct a fresh representation of the flows of information and revenues within the supply chain for the music industry in a future where 1) the majors are nonexistent, and 2) where black markets act as a substitute to the majors.

It explores the historical changes of the music industry supply chain. It considers propositions such as the vertical integration of the historical music industry, the revolution in technology, and the positioning of the artist within the music industry supply chain.

Several questions are tackled: What is the positioning of the artist in the new digital era? And given the changes of position of the major labels and the positioning of the artist, what are the descriptive and prescriptive hypothetical possibilities should the majors disappear and be replaced by alternative elements in the music industry supply chain?

Social network analysis (SNA) of historical data is utilized as a methodological tool in the creation of non-linear and adaptive models.

It must be noted that our approach does not negate nor compete with, but hopes to enhance the very valuable previous research on the unique nature of the music industry. Specifically, Georgina Born and David Hesmondhalgh have edited very valuable articles on differences in the music world from a musicological perspective.[21] Richard Caves has effectively analyzed music contracts between art and commerce from an economist's perspective. He focused on the importance of the economic properties of creative activities.[22] Finally Jonathan Gander, Adrian Haberberg, and Alison Rieple have written extensively on organizational linkages and alliances in the recorded music industry.[23, 24]

Pre-Recording Business Models

Prior to the fifteenth century, the European music industry was mostly a live music industry and was present only in two different settings—in the church at the service of the liturgy and at celebrations in the street. Professional musicians were either street musicians serving as minstrels or church musicians. Book printing and music compilation was the tedious occupation of scribes who exclusively produced choir manuals for

the cantor to teach his singers. Composers were anonymous and their work and music was mainly at the service of the liturgy. A few worked as court composers. The instrument making profession was also marginal and in its infancy stage. The organ was not used in the church until the twelfth century and other instruments were included subsequently. This is mostly because the church associated instrumental music with paganism and thus instruments were banned from church music-making. Minstrels often produced their own instruments amateurishly (see Figure 1 and Table 1).

Early business models emulated the expansion of the composer's work brought about by the invention of printing and the growth of amateur music-making organizations, the consequent development of music publishing, and the gradual creation of an international audience. The social and political results of the Napoleonic Wars turned the composer from a humble functionary whose one advantage was his close contact with an audience to a social necessity of a freelance life which was one of inevitable insecurity.[25]

Music printing as a successful commercial enterprise began at a particularly propitious moment in Venetian history, for the years from 1540 until 1570 marked an era of unbroken peace and prosperity for the Most Serene Republic.[26] Architectural projects multiplied, commissions for paintings and sculptures proliferated, and music and literature flourished in both the public and private spheres. The atmosphere of economic growth provided the ideal stimulus for the burgeoning of music printing. Girolamo Scotto and Antonio Gardano exemplified the new period of intense commercialism. Active as publishers, booksellers, and composers from the period around 1536 until 1572, they each issued more than four hundred music publications containing a huge repertory that ranged from masses and motets to madrigals, chansons, and instrumental music by all the leading composers of the day.

In the late fifteenth century Venetian entrepreneurs created a whole new industry, the production of books. Venice was an ideal center for the printing of books. It offered the most advanced distribution system in the world. And because its printers and publishers could not rely on the patronage of a ruler or the church but depended mainly on market forces in order to make a living, the Venetian printing industry from its inception, became a capitalistic enterprise, producing books in larger quantities and distributing them much further afield than any other European center.[27]

These capitalists were called *mercatori* or merchants. The Venetian

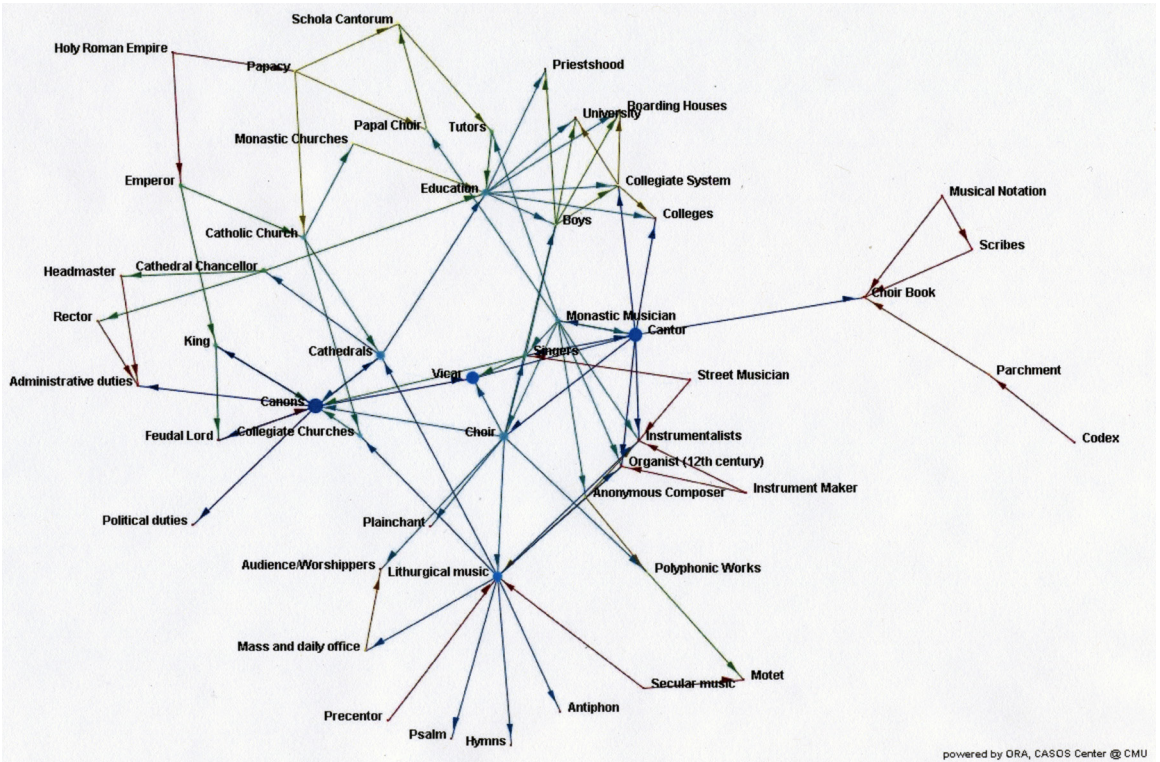


Figure 1. The pre-printing supply chain (500-1400 A.C.). (The charts in this article are high resolution images that may be rotated and enlarged for detailed viewing on screen or for printing.)

Measures	Network
Number of Nodes	51
Number of Links	99
Density	0.04
Centrality-Betweenness	0.02

Table 1. SNA measures for Figure 1.

mercatori dealt with all facets of their trade. They directed a complex mechanized operation that employed a highly skilled workforce and used expensive equipment and materials. They oversaw every aspect of the production of their books, from the acquisition of manuscript to the setting of type, running of presses, and proofreading of copy. As "merchant-capitalists," these men were responsible for all financial aspects of the business. They solicited other printers, publishers, and entrepreneurs to form syndicates or invest in their publications and, in turn, they underwrote the publication of books produced by other bookmen. They cultivated potential authors and clients who might commission books. Above all, these dynastic printers supervised a complex distribution network that extended throughout Europe. They retained book carriers, who hawked their publications from town to town, formed alliances with foreign presses to sell their books, and employed book agents to look after their interests abroad. They owned or invested in bookshops, and, in several cases, maintained satellite offices in other cities (see Figure 2 and Table 2).[28]

Recent Perspectives on the Supply Chain for the Music Industry

The social network analysis in Figure 3 and Table 3 presents the intense mergers history of the majors over the past forty years. The SNA is not comprehensive, as it does not include all of the hundreds of record labels owned by each major. However, it is revealing as it represents each company's unique history and merger strategy. Vivendi purchased three of the most powerful labels—MCA (former major), Seagram and Polygram (former major), as well the BMG publishing group. Each company acquired a music publishing company. Then, the BMG publishing company crossed over to become the number one publishing company, UMG publishing.

EMI and Warner, on the other hand, had a very different experience.

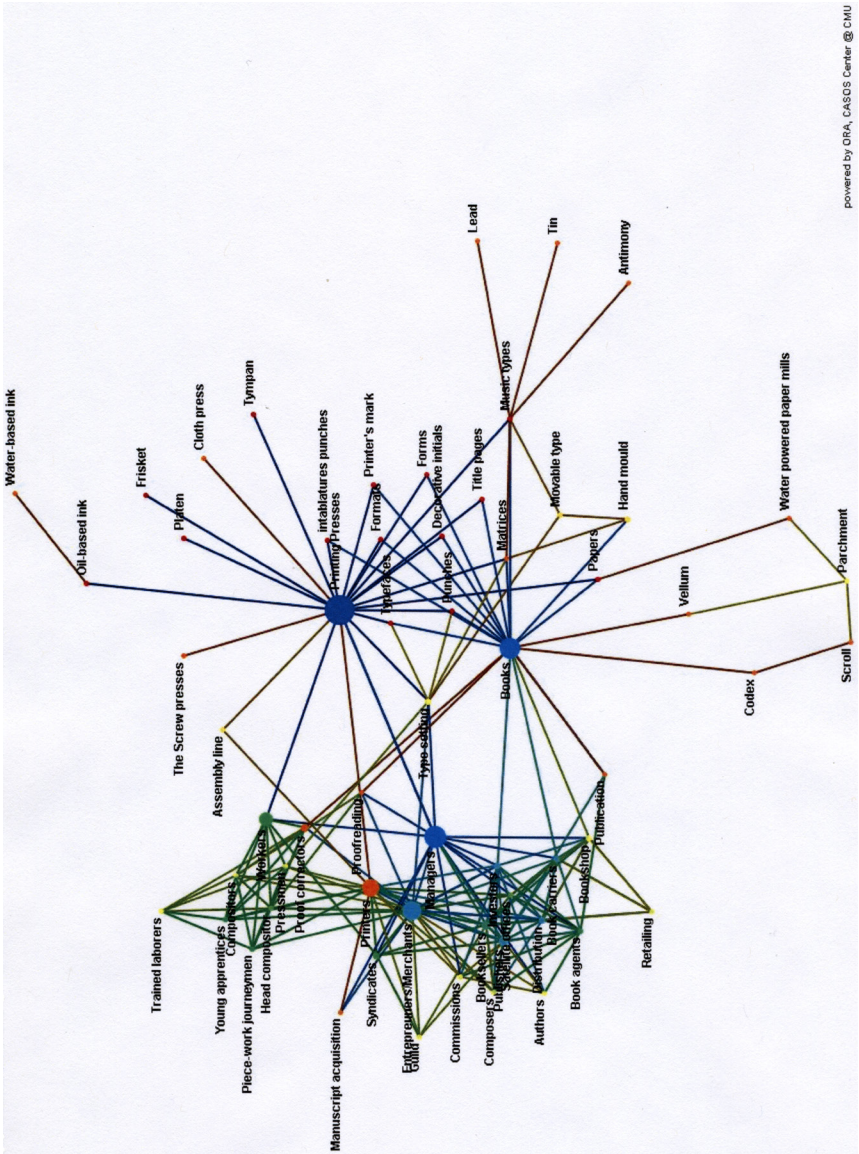


Figure 2. The Venetian printing supply chain (1500-1600).

Measures	Network
Number of Nodes	60
Number of Links	206
Density	0.06
Centrality-Betweenness	0.01

Table 2. SNA measures for Figure 2.

EMI was purchased by the conglomerate Terra Firma Capital Partners as of 2007 and became the only privately-owned major whereas Warner experienced the opposite process as it was divested by the conglomerate Time Warner in 2004, which does not hold any ownership anymore. They lie on opposite sides of the social network and seem to be a mirror representation of each other.

Finally, Sony seemed to have had a more complicated history as its joint venture with BMG in 2004 resulted in Sony acquiring 100% of its ownership over BMG as of 2008. However, Sony made a strategic mistake letting BMG publishing go to UMG, but Sony and UMG seem to have a particular relationship as seen in the SNA.

The next step depicts the Big Three's' technology joint ventures and alliances with "new service companies" (see Figure 4 and Table 4). It shows how the majors are creating alliances with new service companies such as P2P service companies (Qtrax), supply chain management companies (Accenture, Microsoft IM Group), digital distribution companies (iTunes, Amazon.com, Tunecore), mobile phone companies (Verizon Wireless, Sprint, Nokia, AT&T), social networking sites (Myspace), and media and broadcasting companies (YouTube, AOL).

The key information in this SNA is the emergence of the most central nodes: iTunes and Live Nation Entertainment. As of January, 2009 the software-based online digital media store operated by Apple, Inc. accounted for seventy percent of worldwide online digital music sales, making the service the largest legal music retailer.[29] The Big Three cannot do without iTunes. It has become a necessity and the worst fear for the majors because it owns the leading technology for pushing online digital music sales. Note how all of the other "new service companies" are peripheral and act in isolation in comparison to iTunes. This also shows the dominance and the quasi monopolistic position of iTunes as well as the high level of competition and the lack of collaboration between the other tech-

Measures	Network
Number of Nodes	32
Number of Links	42
Density	0.04

Table 3. SNA measures for Figure 3.

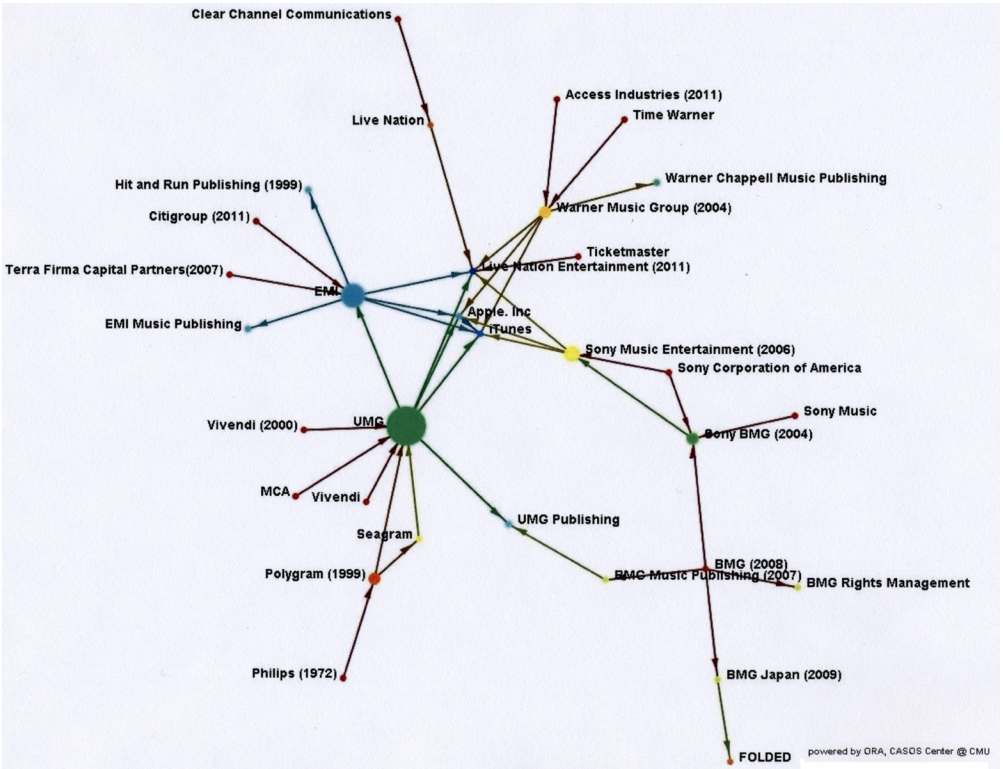


Figure 3. The mergers of the majors in the past forty years.

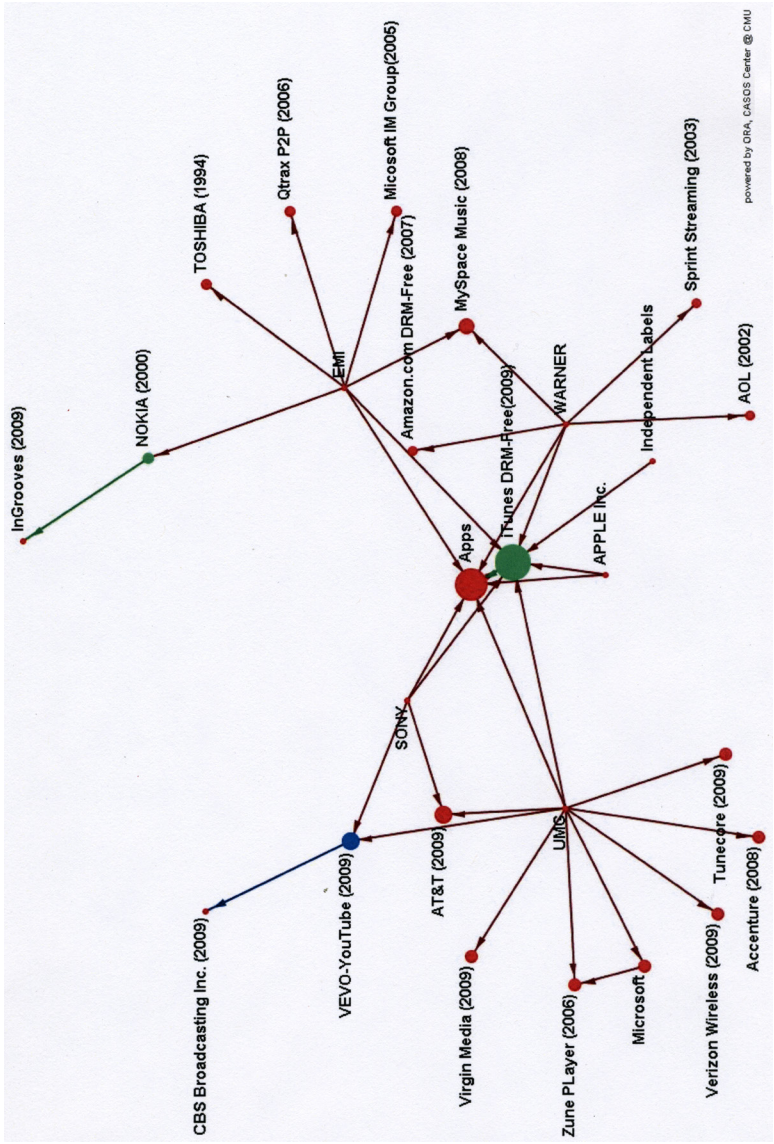


Figure 4. SNA of the Big Three's technology joint ventures and alliances.

Measures	Network
Number of Nodes	26
Number of Links	35
Density	0.05

Table 4. SNA Measures for Figure 4.

nology companies. The low density (0.052) and centralization (0.0026) measures support the fact that there is no cooperation between iTunes and the other technology companies (see Table 4).

Will iTunes become one of the new majors? This is the key question. As artists now have the ability to sell their songs directly on iTunes bypassing record companies it would not be farfetched to suggest that iTunes could replace the majors. If iTunes would acquire and run a major publishing company, the majors would be placed in a very difficult position, as they would have no reason to exist anymore. Leyshon (2001) argues that a secure digitally distributed future, "would be seen in some quarters of the music industry as a highly effective measure to neutralize the power of the retailers."[30]

Another interesting emerging alliance is the collaboration between Sony and UMG on the one hand, and YouTube and Google on the other, to create the online streaming video service Vevo. Would the number one and number two majors attempt to find a safe house within Vevo to survive the dominance of iTunes in the area of the online digital markets?

In terms of strategic alliances, EMI and Warner have adopted similar strategies forming alliances with similar companies and then competing against each other. UMG and Sony have chosen more collaborative strategies.

The SNA also highlights another important detail. Both Amazon.com (2007) and iTunes (2009) have recently been offering their digital products DRM-free. There has been no scholarly literature on this topic. It is an area of great interest for the future of the music industry and an open door for further research.

The Positioning of the Artist Musician

In general the music industry's supply chain has evolved drastically in the past twenty-five years from a traditional model to an online model. To be more accurate, the music industry's supply chain has been recently in an early rebundling stage. Yet, it is more complex than solely an online

value chain. As discussed previously, physical product sales are rapidly declining while record companies try to reposition themselves forming alliances with new service companies. Therefore, the supply chain for the music industry is somewhat in a transitional stage forming a hybrid value chain. In this hybrid supply chain, the positioning of every agent involved in the music industry has been shaken.

Therefore, in this part of our analysis, building on the works of Leyshon (2001), Premkumar (2003) and Graham, Burnes, Lewis, and Langer (2004), we created two distinct sets of social network representations of the music industry's supply chain's information flows and revenue flows. Those SNAs offer a detailed visualization of where the agents involved in the music industry are positioned in the supply chain under different conditions. By combining scenario planning and social network analysis, we have simulated a total of six SNAs for the supply chain's information flows and revenue flows combined. The first two SNA representations in this section are the base scenario or in other words the actual virtual representation of what the music industry's supply chain looks like. The remaining four SNAs are alternate virtual representations of what the music industry's supply chain could become under various conditions.

Analytical measures for the networks as a whole are presented here as well as for five individual nodes (artist, record companies, promotion and distribution, legal services, and publishing companies).

Figure 5 reveals where every agent involved in the music industry is positioned in today's supply chain. The overall density of the network is quite high (0.3169) telling us that the network is cohesive and that every agent is closely intertwined which is also explained by a very high centrality-closeness measure (0.7316).

However, the key information exposed by this SNA is that the artist (content provider) is the most central and important agent in the supply chain. Without the artist, there would be no music industry. The artist has the most links (24) as well as a high centralization total degree measure (0.76). Therefore, the artist carries a high level of cohesiveness with the other agents within the supply chain.

Record companies (20 links, 0.62 centralization total degree) and legal services entertainment lawyers (15 links, 0.44 centralization total degree) are also central to the social network and key players transmitting information throughout the supply chain.

Finally, promotion and distribution companies (16 links, 0.34 cen-

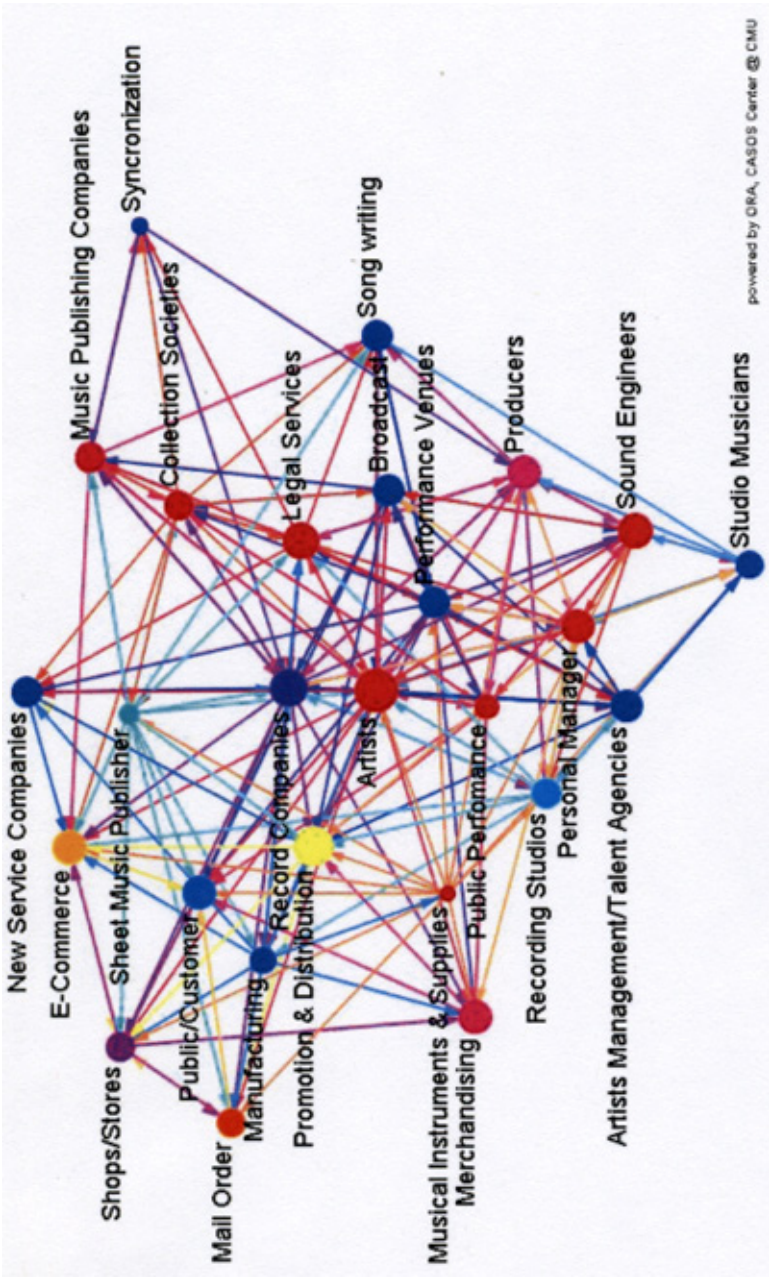


Figure 5. SNA music industry supply chain (information flows).

Important Vertices	Network	Artist	Record Companies	Promo & Distribution	Legal Services	Publishing Companies
Number of Nodes	26	1	1	1	1	1
Number of Links	206	24	20	16	15	9
Density	0.3169	NA	NA	NA	NA	NA
Centralization Measures						
Total Degree	0.48	0.76	0.62	0.34	0.44	0.3
Indegree	0.3776	0.68	0.52	0.52	0.4	0.28
Outdegree	0.544	0.84	0.72	0.16	0.48	0.32
Centrality-Betweenness	0.2244	0.1654	0.264	0.1521	0.057	0.0243
Centrality-Closeness	0.7316	0.8621	0.7813	0.3521	0.641	0.5814

Table 5. SNA measures (information flows).

tralization total degree) and music publishing companies (9 links, 0.3 centralization total degree) also have important functions within the supply chain keeping the information flowing within the network and supporting the artist and the record companies.

Figure 6 represents the revenue flow in the music industry's supply chain. This network is much less cohesive as shown by a low level of density (0.1215) (see Table 6). Again, the artist is the most central vertex or agent within the supply chain (18 links, 0.4 total degree). The indegree measure (0.32) shows the variation of vertices that provide revenue to the artist whereas the outdegree measure (0.48) shows the variation of expenses that the artist provides to the other agents within the supply chain.

The record companies are in a similar position as the artist regarding revenue flow. The outdegree measure (0.56) shows us that the record companies greatly contribute economically to the music industry's supply chain. In fact, the SNA tells us that the record companies are the biggest contributors to the supply chain. Therefore many agents within the supply chain depend on the record companies to survive.

Note that the legal services (outdegree 0, indegree 0.32) and pro-

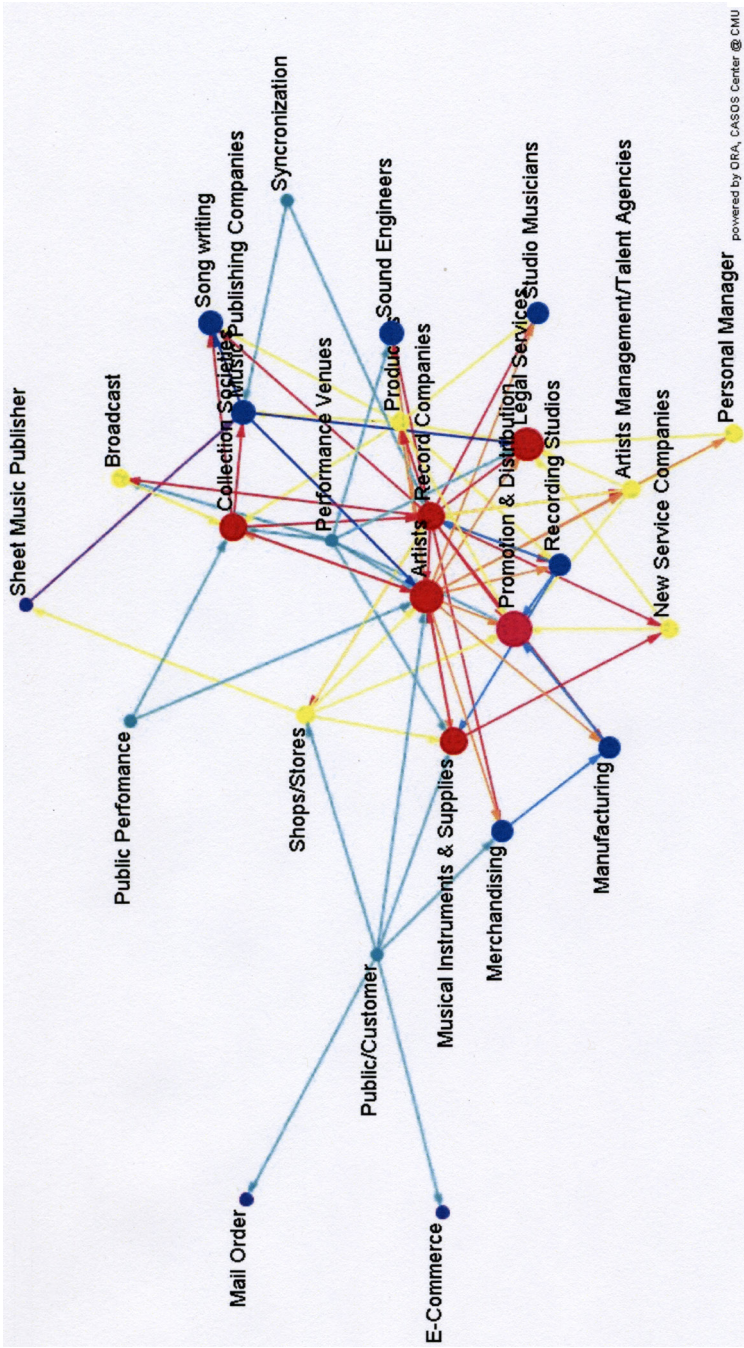


Figure 6. SNA music industry supply chain (revenue streams).

Important Vertices	Network	Artist	Record Companies	Promo & Distribution	Legal Services	Publishing Companies
Number of Nodes	26	1	1	1	1	1
Number of Links	79	18	16	9	8	7
Density	0.1215	NA	NA	NA	NA	NA
Centralization Measures						
Total Degree	0.3017	0.4	0.38	0.18	0.16	0.14
Indegree	0.248	0.32	0.2	0.36	0.32	0.16
Outdegree	0.456	0.48	0.56	0	0	0.12
Centrality-Betweenness	0.1556	0.1694	0.1504	0	0	0.0379
Centrality-Closeness	0.2427	0.1344	0.1389	0.0385	0.0385	0.125

Table 6. SNA measures (revenue streams).

motion and distribution (outdegree 0, and indegree 0.36) are only on the receiving end of the revenue flow. Therefore they do not contribute financially to the other agents within the supply chain.

Scenario 1: "What If" Record Companies Disappeared?

Figure 7, the first alternate scenario, shows a supply chain where record companies are nonexistent. In the occurrence of such an event the supply chain would become much less cohesive as shown by an extremely low-density measure (0.933) (see Table 7). Visually this is obvious as the network becomes more stretched out exhibiting more outliers such as the synchronization or the talent agencies/agencies vertices.

The positioning of the artist is virtually unchanged. In fact, as record companies disappear, the artist must get more involved, take charge, and "self-manage." This is partly shown by increased measures of total degree (0.77) and outdegree (0.875) as well as a slight increase in centrality-closeness (0.89).

Lawyers would also have increased responsibility as some of the tasks formerly performed by the record companies would be delegated to

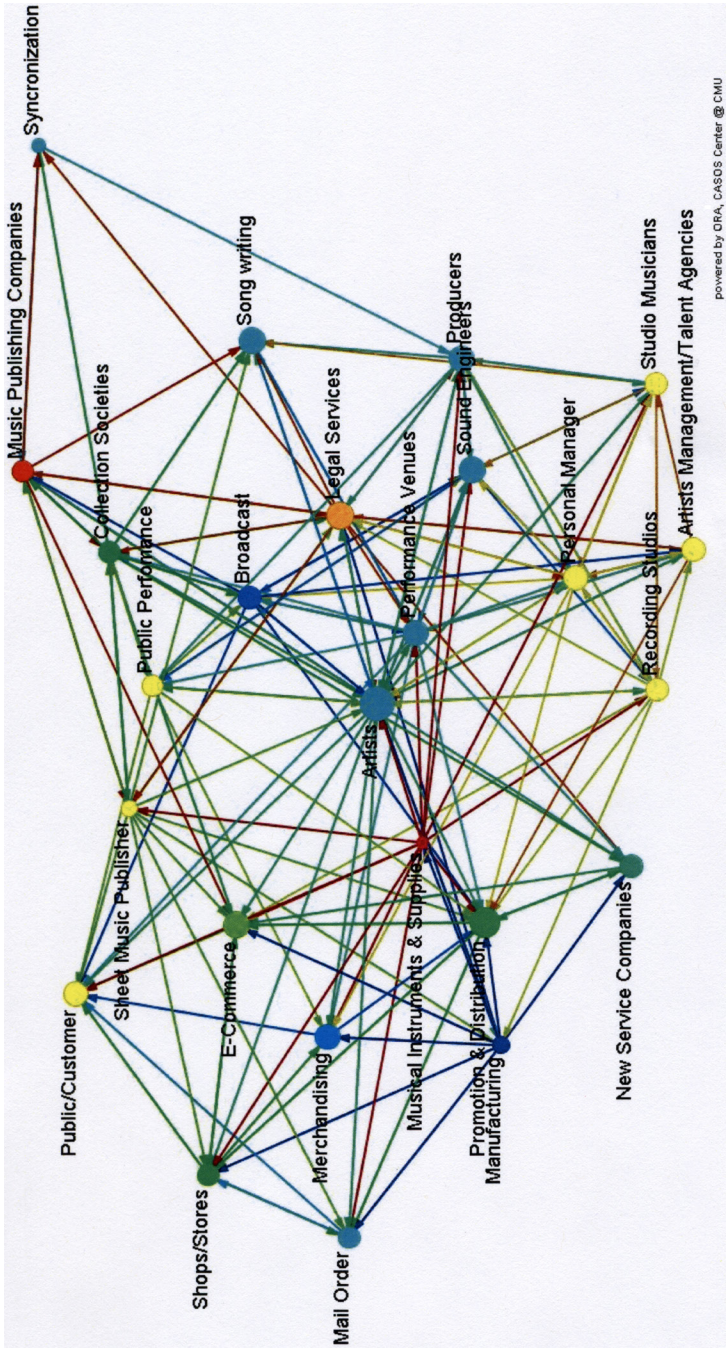


Figure 7. SNA music industry supply chain (information flows {minus} record companies).

Important Vertices	Network	Artist	Promo & Distribution	Legal Services	Publishing Companies
Number of Nodes	25	1	1	1	1
Number of Links	176	23	15	14	8
Density	0.933	NA	NA	NA	NA
Centralization Measures					
Total Degree	0.519	0.7708	0.3333	0.4167	0.2708
Indegree	0.3889	0.6667	0.5	0.375	0.25
Outdegree	0.6059	0.875	0.1667	0.4583	0.2917
Centrality-Betweenness	0.1966	0.2127	0.0328	0.0533	0.0256
Centrality-Closeness	0.9414	0.8889	0.0524	0.6316	0.5714

Table 7. SNA measures (information flows {minus} record companies).

them. This is also the case for the artist as represented by an increase in total degree measure (0.4167), as well as outdegree (0.45) and centrality-closeness (0.63) measures.

However, the promotion and distribution companies and music publishing companies, as well as most of the other agents within the supply chain, would be impacted negatively as the flow of information and tasks would slow down as in a stage of recession. This is shown by lower measures across the board.

The first alternate scenario's revenue flow network (see Figure 8) is also impacted by a lower level of cohesiveness (density 0.1067 as compared to 0.1215 in the base model) (see Table 8). Surprisingly, all of the agents—including the artist and lawyers—within the revenue flow supply chain are worse off in this scenario. This information is provided by the lower values in the indegree measures for all the agents and the network as a whole.

Therefore, we would argue that the majors are the driving force behind the economic welfare of the music industry's supply chain. If the majors were to disappear, which is a likely possibility, the present social network analysis predicts that it would financially impact the whole supply chain including the artist.

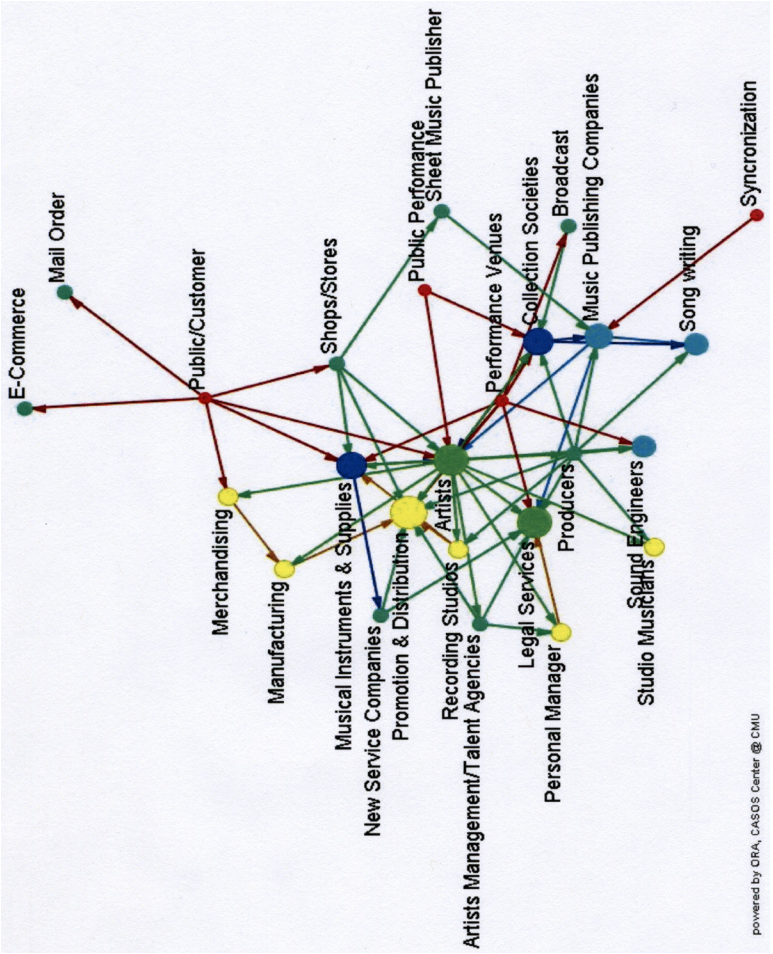


Figure 8. SNA music industry supply chain (revenue streams {minus} record companies).

Important Vertices	Network	Artist	Promo & Distribution	Legal Services	Publishing Companies
Number of Nodes	25	1	1	1	1
Number of Links	64	20	8	7	7
Density	0.1067	NA	NA	NA	NA
Centralization Measures					
Total Degree	0.4049	0.4792	0.1667	0.1458	0.1458
Indegree	0.2361	0.2917	0.3333	0.2917	0.1667
Outdegree	0.5833	0.6667	0	0	0.125
Centrality-Betweenness	0.279	0.2868	0	0	0.0731
Centrality-Closeness	0.2605	0.1412	0.04	0.04	0.1304

Table 8. SNA measures (revenue streams {minus} record companies).

Scenario 2: "What If" Piracy and Black Markets Became a Substitute for The Record Companies?

The purpose of the second alternate scenario (Figure 9) is to test the impact of piracy and black markets on the music industry's supply chain in a world where record companies do not exist. It has been previously discussed that record companies incur significant losses due to piracy and black markets. This second scenario builds upon previous models to pay particular attention to artist welfare.

The results are quite surprising as the overall network is much denser than in the previous scenario (0.2892) (see Table 9). However, it is slightly less dense than our base scenario (0.3169). Our most central agent is again the artist. The artist is here impacted by piracy as regard to the inflow of information (indegree 0.64). However, the outdegree and the centrality-closeness measures are hardly impacted at all. This can be explained by the fact that black markets and piracy also rely on the artist's creative work in order to make a profit.

Also interesting, lawyers are slightly impacted (total degree 0.4, centrality closeness 0.625) by the advance of piracy and black markets because the latter does not require legal services. Similarly, music publishing

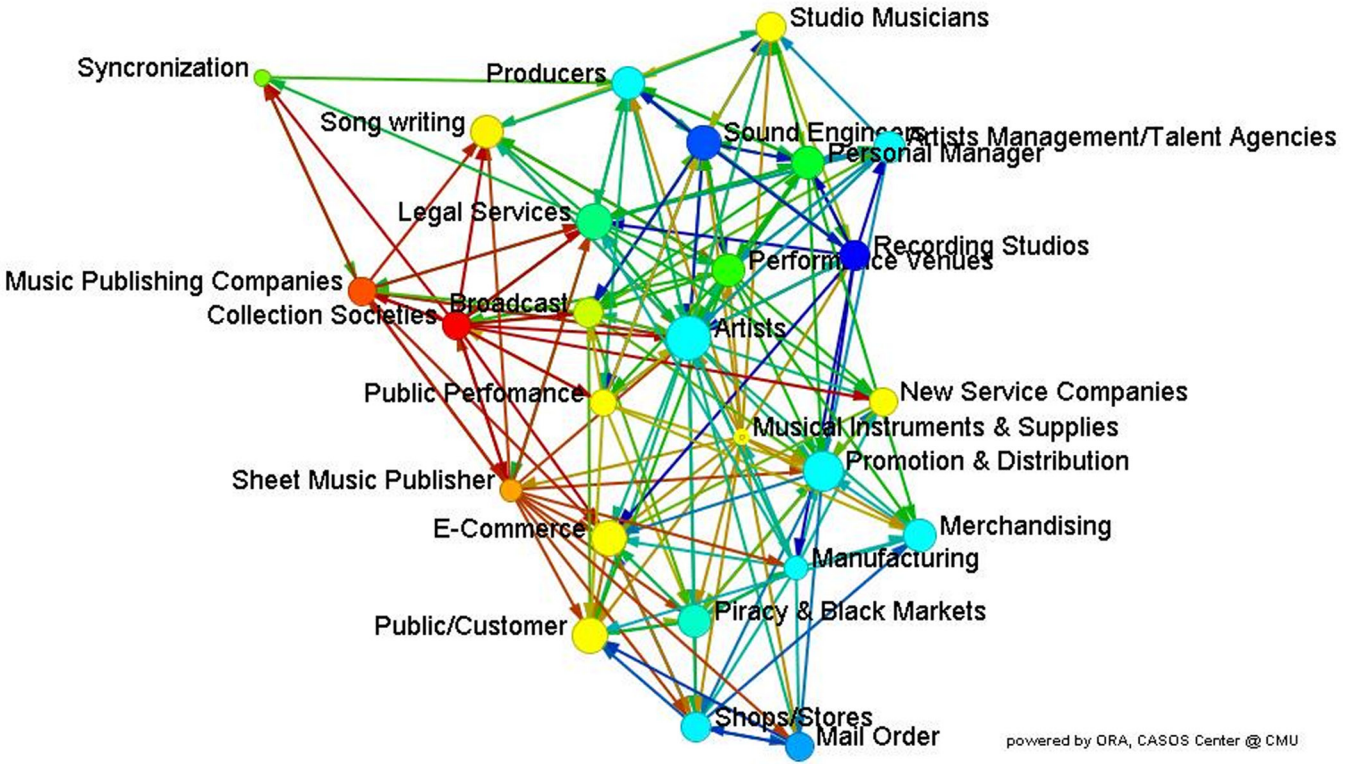


Figure 9. SNA music industry supply chain (information flows {minus} record companies {plus} piracy & black markets).

Important Vertices	Network	Artist	Promo & Distribution	Legal Services	Publishing Companies
Number of Nodes	26	1	1	1	1
Number of Links	188	24	16	13	8
Density	0.2892	NA	NA	NA	NA
Centralization Measures					
Total Degree	0.4883	0.74	0.34	0.4	0.26
Indegree	0.3648	0.64	0.52	0.36	0.24
Outdegree	0.5728	0.84	0.16	0.44	0.28
Centrality-Betweenness	0.2334	0.2775	0.0304	0.1226	0.0258
Centrality-Closeness	0.7608	0.8621	0.2632	0.625	0.5682

Table 9. SNA measures (information flows {minus} record companies {plus} piracy & black markets).

companies (total degree 0.26) are further negatively impacted as piracy and black markets, marginal by definition, do not require their services.

In this last figure (see Figure 10), the impact of piracy and black markets on the revenue flow within the music industry's supply chain is quite clear. The density of this network is the lowest of the three (0.1) (Table 10). In this scenario the artist suffers a great deal shown by lower scores in total degree (0.36 as compared to 0.4 in the base scenario and 0.48 in the first alternate scenario) and in centrality-closeness (0.089 as compared to 0.134 in the base scenario and 0.141 for the first alternate scenario). Therefore, the artist's economic welfare greatly suffers from piracy and black markets. Let us mention that P2P file sharing could to some extent be affiliated to the category of the piracy and black market agent.

Legal services and music publishing companies are also slightly negatively affected by the piracy and black market but to a much lesser degree than the artist. Finally, we would like to add that as seen in the layout of this SNA it is obvious that if a vertex representing the record companies were to be added, it would suffer similar losses to the artist.

Conclusion

Early business models present the central positioning of the artist

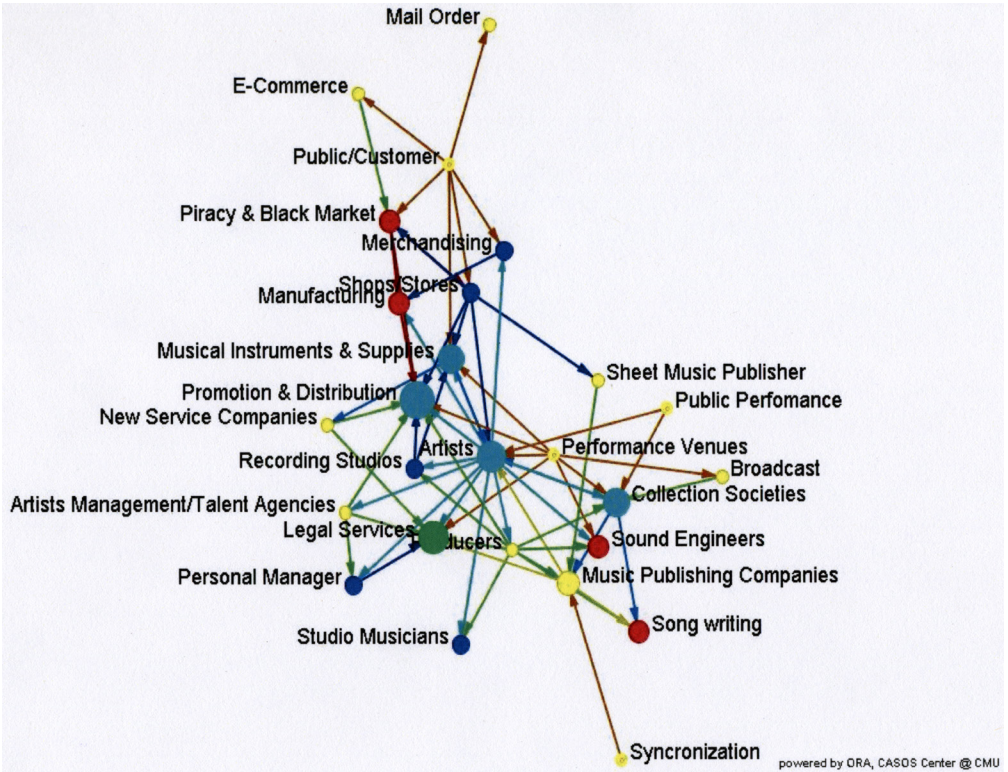


Figure 10. SNA music industry supply chain (revenue streams {minus} record companies {plus} piracy & black markets).

Important Vertices	Network	Artist	Promo & Distribution	Legal Services	Publishing Companies
Number of Nodes	26	1	1	1	1
Number of Links	65	16	9	7	7
Density	0.1	NA	NA	NA	NA
Centralization Measures					
Total Degree	0.2817	0.36	0.18	0.14	0.14
Indegree	0.2704	0.24	0.36	0.28	0.16
Outdegree	0.3952	0.48	0	0	0.12
Centrality-Betweenness	0.2265	0.2374	0	0	0.0578
Centrality-Closeness	0.1937	0.0899	0.0385	0.0385	0.0868

Table 10. SNA measures (revenue streams {minus} record companies {plus} piracy & black markets).

musician in a radically different function when compared to recent depictions. From 500 to 1400 A.C., the artist was anonymous and the body of work created was at the service of the liturgy in the case of religious music or used for celebrations in rural communities and considered to be part of the traditional music repertoire which was passed on in an aural tradition. Most of the printing and instrument-making industries were in a state of infancy due to the lack of means for mass production. The supply chain had essentially a social and educational function.

With the advent of the printing press (1500-1600), composers started to get their work published under their own names. The Venetian printing press was perhaps the first entrepreneurial business model in the history of the music industry. Capitalist merchants (*mercatori*) who also acted as composers, bookstores owners, investors, and managers controlled a vast and complex distribution trading system. This oligopoly and highly vertically integrated model was established in sixteenth-century Venice and laid out the initial framework used much later on by the recording industry.

However, the music industry's supply chain has evolved drastically in the past twenty-five years from a traditional model to an online model.

To be more precise, the music industry's supply chain has been recently in an early stage of rebundling. It is a bit more complex than purely an online value chain. As discussed previously, physical product (CD) sales are rapidly declining while record companies attempt to reposition themselves forming alliances with new service companies. Therefore, the supply chain for the music industry is somewhat in a transitional stage forming a hybrid value chain. In this hybrid supply chain, the positioning of every agent involved in the music industry has been shaken. The present study offers visual representations of the new positioning of those agents: the intense merger history of the majors over the past forty years and the creation of joint ventures and alliances with new service companies such as P2P service companies, supply chain management companies, digital distribution companies, mobile phone companies, social networking sites, and media and broadcasting companies.

The emergence of the central positioning of iTunes and Live Nation Entertainment as shown in the SNA(s) (Figures 4 and 5) is of great importance as these two conglomerates present a serious threat to the long-established dominance of the majors. Could one or both of them become the new Big Four and Five?

The supply chain SNA representations also depict the artist as the single most central and most important agent in the supply chain. Without the artist there would be no music industry. SNA also demonstrates that the record companies are currently the biggest contributors to the supply chain. Thus, many agents within the supply chain depend on record companies to survive.

The majors are still the driving force behind the economic welfare of the music industry's supply chain. In a hypothetical future where the majors would disappear, our alternative SNA (Figures 7 and 8) predicts it would financially impact the whole supply chain including the artist. Finally, our second scenario (Figures 9 and 10) clearly shows in a visualization format that the artist's economic welfare suffers greatly from piracy and black markets.

Endnotes

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2. J. Hagel III and M. Singer, "Unbundling the Corporation," *Harvard Business Review* (1999).
3. The authors believe that the term *interaction costs* is more accurate than the common term *transaction costs*. Transaction costs, as economists have defined them, include the costs related to the formal exchange of goods and services between companies or between companies and customers. Interaction costs include not only those costs but also the costs for exchanging ideas and information. They thus cover the full range of costs involved in economic interactions. For more about the implications of falling interaction costs see Patrick Butler et al., "A Revolution in Interaction," *The McKinsey Quarterly* (1997, no. 1).
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