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*"Look at Napster, if the music industry had created something that offered all their songs for a fee, people would have flocked to it. Instead, they waited too long and paid the price."*

DivX Networks co-founder Jordan Greenhall (Cave 2001)

## **1. INTRODUCTION**

Although Napster has had extensive media coverage it has been largely due to the legal litigation with the music industry. This has partly covered the role of sharing networks in redefining the way internet users exchange digital goods online and in creating a new level of interaction among internet users. This essay discusses the factors involved in the success of Napster and similar P2P trading services beyond that of providing commercial music at no cost. The reason for this approach comes from the fact that the music industry will have to adapt to the new situation emerging from the new information technologies and in particular Napster and its clones. There are two main paths the industry could follow. First, it could radically change its structure and accept the reduced revenues from copyright, becoming essentially a public relations company, in which case, both musicians and recording labels would have to learn to obtain their revenues from alternative sources such as concerts and/or product endorsements. In this case, Napster-like network would continue to operate. The second, alternative for the industry, which is the first that will be attempted, is to offer similar services to Napster but charging some kind of subscription fee. In this case, understanding those factors that make Napster successful beyond being a tool for piracy, is a key element for the development of these future services for the legal distribution of music and possibly other kinds of digital goods. Therefore, assuming that the recording industry will not disappear, the fact that sharing networks provide free copyrighted content is an significant factor now but whatever path is taken by the music industry, it may be less important in the future.

This essay concentrates on Napster and the trading of digital music rather than on other sharing networks which allow the distribution of other forms of digital goods such as software. Music, in great part thanks to Napster and the MP3 format, is leading the way in this new form of digital goods distribution. The results from Napster's on going litigation with the music industry will create the basis for future industry supported services. Moreover, music has many interesting characteristics, which are discussed in this essay, that make it ideal for this type of distribution. Many of these characteristics could be extrapolated to other digital goods to which this essay refers as *content*. This group includes movies and electronic texts, which have several significant differences to other digital goods, such as software or real-time information.

When talking about Napster it will be in reference to the service in its pre-March 2001 form, that is before filtering and/or subscription based service was available. For this reason this essay may often refer to Napster in the past. Also, referring to Napster could mean any kind of similar service, legal or illegal, operated from an organization other than Napster and dedicated to music.

Finally when referring to digital music it is implied that it is in the form of computer files, that is, a digital good. Unless otherwise specified it will not refer to other forms of digital music contained in audio CDs, DAT tapes or other formats.

## 2. PECULIARITIES OF MUSIC AS A DIGITAL GOOD

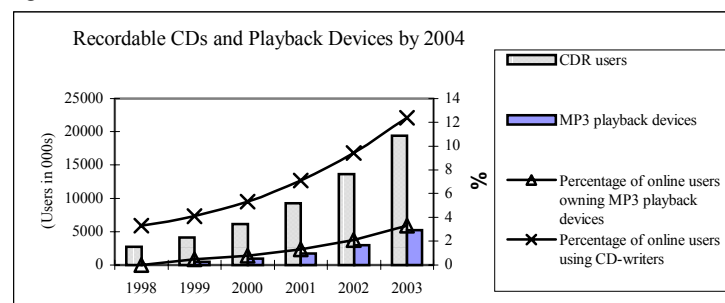
Music has several peculiarities that make it ideal for trading in a Napster-like system. Some of these properties are inherited from its classification as *content* and as a form of art. Other peculiarities come from the fact that music can be easily converted into a computer file and sent over digital communication networks and therefore it inherits the properties of digital goods. This section discusses some these characteristics that make music a particular case of digital good.

### *Adequacy of current technology for digital music*

The characteristics of digital music put it in a position that perfectly matches the current state of information technology. Textual information, in the form of electronic books, has not yet been widely adopted partly because of current computer screens limitations and the high prices of dedicated reading devices (Cuadriello and P. Amor Echeverri 2000). On the other hand, digital video files are still too large for the bandwidth available to most users and decoding highly compressed formats requires large amounts of processing power. However a digital music file, using MP3 or similar compression formats, can be reduced to a size that makes it reasonable to download even across a standard telephone line. Furthermore, decoding and listening to compressed digital music only requires modest processing power which can be handled by almost any Pentium class computer.

Current storage capacity also matches the requirements of compressed digital music. MP3 provides a compression ratio of about 1/10. Storage devices, such as recordable CD drives, allow users to store ten times as much music as a normal audio CD. According to Andy Gove's "10 x rule of thumb" (Shapiro and Varian 1999), for a new technology to succeed, it has to offer a performance about ten times better than the existing technology. This is exactly what the MP3/CD writer combination offer. Demand for MP3 music, CD-writers and access to the internet continue to grow (See Figure 1) each fuelling each others' growth. In addition, recording media for these devices can be bought for around €1 compared to the price of a pre-recorded audio CD in a music shop which sells for around 15 to 20 €, which represents again about a 1 to 10 improvement for the user.

Figure 1



(Graves and McAteer 1999)

Furthermore, the abundance of digital music in the form of audio compact discs provides a perfect source for the creating music files that can be transferred across the internet. Few content based digital goods have such a rich source to allow individuals to create their own digital goods. For example there is only a reduced number of available digitalized texts and DVDs are relatively recent and hard to convert to a format that allows electronic distribution.

Finally, music is a form of art that everybody enjoys. Yet, young people have traditionally being some of the strongest consumers for music. This group does not usually have a very strong purchasing power, but a large part of it has relatively high familiarity with new information technologies. Furthermore, most university students enjoy free access to their universities' high-speed networks. All these factors combined draw students towards MP3 files and Napster-like music trading networks. These same factors may make university students to adopt, or even develop, other networks if current services are banned or radically changed.

#### *Content – A Non perishable good*

A song as any other content, digital or not, such as books, music, video or images does not change with time, unlike other digital products such as software which gets updated with new versions or stock quotes that are constantly adjusted. A song, as a form of art, cannot be upgraded. Therefore once it is acquired by the customer it will only be possible to make him/her buy it again if a format offering superior performance is introduced. This means that people that have large quantities of MP3 files may not have a reason to repurchase it in other formats unless they are largely superior. Furthermore, it is impossible to keep old CDs in production or books in print and into the distribution channels indefinitely. It is also impossible to distribute books, music or even movies that have small markets using traditional methods as it is not economically viable. Therefore only a limited number of recent and/or popular CDs or books can be kept in stock. Allowing distribution of old material and/or specialised material is an important advantage obtained from the cheap reproduction and distribution costs of digital goods and digital distribution. Therefore digital versions of these materials have an important customer appeal. Napster was the first to put this in practice in the field of music at a considerable scale.

#### *Difficulty in the protection of digital music against illegal reproduction and distribution*

*“Technology and Communication bring efficiency. Money is made in inefficiency”*  
John Phelan Jr. former CEO of the NYSE. (Bakos 1991)

Digital music includes computer music files, usually MP3s, and music recorded onto compact discs and to a lesser extent in DAT tapes, MiniDiscs and others. None of these formats currently incorporates any kind of protection against copying or distribution. This lack of protection was transferred to MP3 files by extracting or “ripping” music from audio CDs. Information in digital form radically reduces the difficulty and cost of reproduction. Moreover, it produces perfect replicas, each of which can be a seed for further perfect copies

However, before Napster and MP3 and despite the lack of protection in audio CDs, the music recording industry was very successful in producing digital music while avoiding digital copying and in particular distribution from taking place on a wide scale (Shirky 2000). The main barrier was the cost of reproduction equipment and lack of widespread access to computer networks. But the increased use of computers, internet access in the home and the large number of unprotected audio CDs, has enabled individuals or commercial infringers to copy and distribute unauthorised copies (Samuelson - Davis 2000) worldwide and almost instantaneously. Furthermore, the ease in copying and distributing digital material, reduces users' perception of performing an illegal activity. All these factors have increased the number of small-scale infringements by private individuals which now may have an important effect (Samuelson - Davis 2000). Intellectual protection laws, like all laws, were built on implicit assumptions about the difficulty of violating the law. (Samuelson - Davis 2000) but digital technologies have made some of these laws partly obsolete.

Some publishers have tried to use technical protection systems (TPSs) to confront the key problem of distributing digital information without the risk of large-scale unauthorised copying and redistribution. The idea behind TPSs is to try to offer rights holders some assurance that distributing a single copy of a digital work need not result in subsequent unlimited and uncontrollable dissemination (Samuelson - Davis 2000). The two main technologies used are encryption and watermarking.

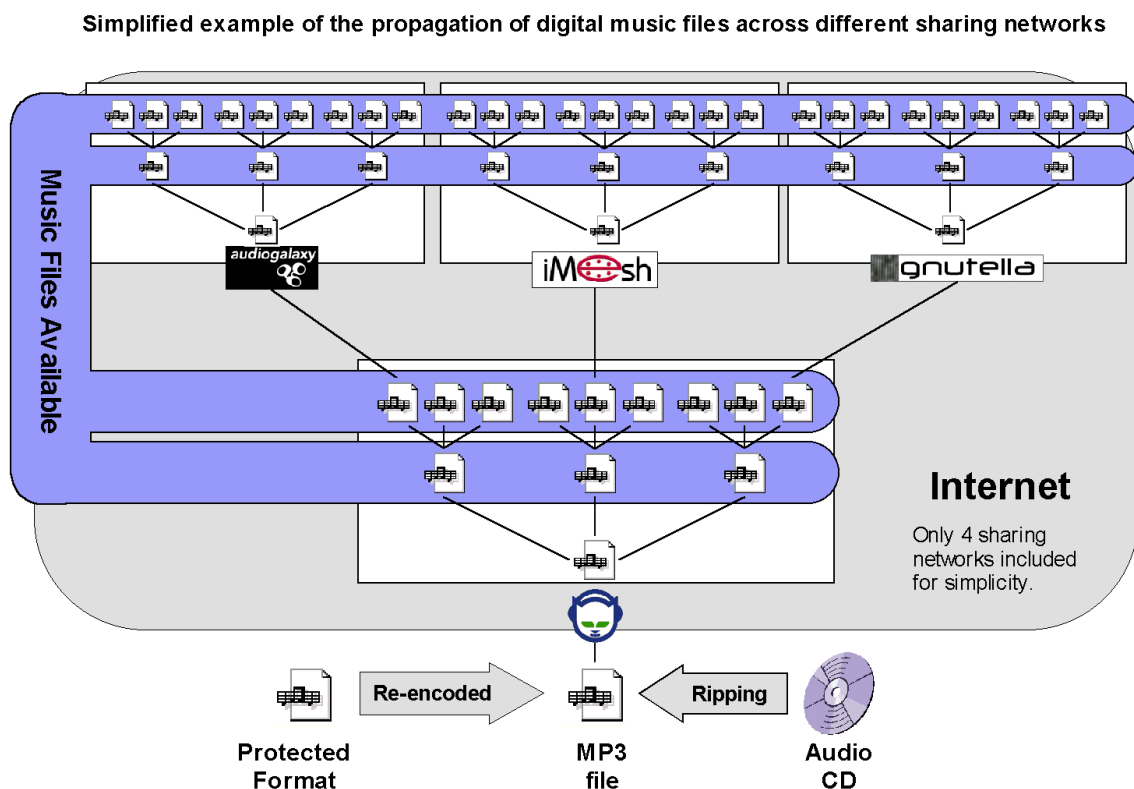
Encryption technologies scramble a digital song file so consumers can only play it back with software capable of first decrypting it. Music delivery outfits such as eMusic and Liquid Audio rely on encryption and custom client software to limit playback to consumers who have paid for a particular song (Graves and McAteer 1999). Watermarking, such as the SDMI initiative, imprints a unique identifier into a song file in some cases into the music themselves. The idea is that a watermark will survive most types of copying, and permit anti-piracy authorities to determine the source of a particular file regardless of how many times it has been copied, which should help to track down pirates (Graves and McAteer 1999).

However, these technologies are likely to remain vulnerable to hackers, and new protection schemes may only present a new challenge for hackers to conquer (Pidgeon, Sinnreich et al. 2000) as the defeat of DVD encryption in 1999 has shown. Furthermore, a fundamental weakness of encrypting digital content lies in the fact that at some point the material must be decrypted for the consumer. A music file, for instance, has to pass through a computer's sound card and be transmitted to the speakers. Hijacking the data at that point to make copies is relatively trivial regardless of the security originally in place. Meanwhile, devising even a first-generation defence against such hijacking as Microsoft is reportedly attempting to do (England 2001; Lettice 2001) involves reworking the way the operating system and sound hardware interact and incorporating standardized decryption onto the sound card or into the speakers. Such initiatives and other serious attempts to regulate digital distribution too tightly could alienate consumers and possibly developers and draw users towards alternative systems, therefore proving to be ineffective against piracy (Graves and McAteer 1999).

Furthermore, despite zealous litigation by industry groups and individual intellectual property owners, it seems clear that technology, for which Gnutella and Freenet are leading the way, will continue to evolve and enable increasingly anonymous and possibly untraceable exchange of digital media via decentralized server schemes. Consequently, it is expected that electronic distribution will continue to frustrate intellectual property owners at least to some extent (Pidgeon, Sinnreich et al. 2000).

However, the most important fact regarding the impossibility of protecting digital music, despite all the existing and future secure formats, is that there are already millions of digital files in non-protected formats and hundreds of programs to compress and play these files. Therefore, even if an encryption scheme could be enforced into MP3 players, “illegal” music would still be able to be listened to in many devices (Cuadriello and P. Amor Echeverri 2000). Furthermore, even if only a small number of people choose to re-encode protected music into MP3 or some other freely distributable format, the fluidity of information-sharing communities will ensure its rapid and extensive duplication in an exponential manner (Cuadriello and P. Amor Echeverri 2000) as the simplified example in Figure 2 clearly illustrates.

Figure 2



### 3. NAPSTER AS AN INFORMATION BROKER IN AN ONLINE MUSIC MARKET

#### *Napster as an online market*

Napster and similar services can be seen as a particular type of market. Even if the goods that are traded are de facto free, these markets still provide a good example of efficient transactions. Moreover, it is not totally a market of free goods; uses trade bandwidth and systems resources. Therefore, a user may choose to stop a “free rider”<sup>1</sup> or stop a user that is downloading too many songs and slowing down the user’s internet connection. Even if a flat rate form of payment is introduced, the situation will be largely unchanged, and if a similar service includes a pay-per-song system, it will resemble even more a conventional market. Despite of the differences with more traditional markets, many of the aspects that contribute to making an electronic marketplace an efficient and desirable form of trading arrangement are common to Napster. Therefore these aspects provide a strong argument to explain its success and most importantly the possible success of similar future pay per use services.

Malone and Smith (Malone and Smith 1984; Malone 1985; Malone, Yates et al. 1987) identify production and coordination costs affecting a market setting. Music, as a digital good, has low production costs or at least low reproduction costs. Coordination costs include among others the selection of suppliers and the negotiation of contracts (Malone, Yates et al. 1987). These costs tend to be relatively high in a traditional market. However, Napster, as other online markets, benefits from the *electronic communication effect* described by Malone and Yates (Malone, Yates et al. 1987). This means that information technologies may allow more information to be communicated in the same amount of time (or the same amount in less time) while simultaneously decreasing the costs of this communication (Malone, Yates et al. 1987). Therefore the higher efficiency achieved in the process reduces coordination costs.

The increase in efficiency obtained by the use of information technologies is further enhanced by the low complexity of product description (Malone, Yates et al. 1987) of digital music. Music is a simple product; in MP3 form, a song can be basically differentiated by its name, artist, bitrate and, in a Napster environment, the connection speed to download the file. This simplicity in product description requires little information exchange, increasing even more the efficiency of the music market.

Due to the high standardisation of the quality audio CDs, which to some point could be extrapolated to the MP3 format, music, in general, is not acquired based on price. Therefore a hypothetical future pay-per-download service should still benefit from the low complexity of product description associated to music. ,

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<sup>1</sup> People who download music files without contributing by making their own files accessible to other users Adar, E. and B. A. Huberman (2000). Free Riding on Gnutella. Palo Alto, CA, Xerox Palo Alto Research Center.



Napster-like networks, also achieve cost reductions in the general market transaction phases described by Picot (Picot, Bortenlaenger et al. 1995; Picot, Bortenlaenger et al. 1997) increasing the efficiency of all these phases.

Napster's biggest strength comes in the *Information phase*; this is where the market actors find information about other markets participants (Picot, Bortenlaenger et al. 1997). In this phase these market participants will incur in search costs (Ciborra 1993). Before Napster, digital music files could be found in private FTP servers, Usenet newsgroups, and webpages. Search engines like Lycos MP3 search<sup>2</sup> and others were used to find this music. However, the search costs for finding information about the location of this music were very high; finding music in Usenet or reliable links from mp3 searches and finding owners of good FTP servers required a considerable amount of time. Napster reduced the search costs to a minimum, beating all previous music distribution systems, both in the real world, such as browsing the shop, and other online systems such as online music shops or on the arguably more illegal side, MP3 search engines.

The other phases identified by Picot include the *Order Routing phase*, where the market actors inform other market actors about the desire to conduct a specific market transaction. The *Execution phase*, in which the terms of the exchange are negotiated and the *Settlement phase*, where the executed transaction is settled (Picot, Bortenlaenger et al. 1997). In all these phases, participants incur in contracting costs related to the negotiation of the terms of trade and control and regulation costs (Ciborra 1993). The Napster model changes this as it substitutes the one-to-one trading relationship with a community relationship. Therefore the rules are clear, everybody is free to download everything from everybody and viceversa. At the same time everybody can stop a song request. This clear and simple rules make negotiation and regulation costs negligible. Maintenance costs to let the exchange develop, also identified by Ciborra (Ciborra 1993) are also small, this being a characteristic of most electronic markets.

Therefore, the Napster network operates as an extremely efficient market place. And this efficiency should not be largely affected by fee-based service.

#### *Napster as Information broker*

Napster, in its original form, stores information about the MP3 files that users have in their hard drives and provides this information to the community. It does not trade with music, but with information about the location of music. Users create a *peer-to-peer* (P2P) connection to transfer the music file, but Napster servers make this connection possible. This is done by allowing the user that owns a given file (*uploader*) and the user that wishes to download it (*downloader*) to contact each other by filtering all the other songs in the network from the search. That is, Napster acts as a broker and reduces the need for *uploaders* and *downloaders* to contact a large number of alternative users individually. As this is done automatically by a central database and the efficiency of the whole music trading process benefits from the *electronic brokerage effect* described by Malone and Yates (Malone, Yates et al. 1987). Electronic brokerage can increase the number of alternatives and increase

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<sup>2</sup> mp3search.lycos.com

the quality of the alternative ultimately selected; in this case a faster download speed and/or bitrate<sup>3</sup>. Finally it decreases the cost of the entire product selection process (Malone, Yates et al. 1987) by combining the efficiency added by the broker and by information technologies.

Purer P2P systems such as Gnutella do not have this central database, and therefore every member of the network acts also as an information broker. However, the benefits of information brokerage reside in the centralization of information. These pure P2P systems decrease the efficiency of the process as the information flow is far larger and more complicated. The network and the client software deals with this information flow but the inefficiency is reflected in the search times. Therefore, pure P2P networks, although accomplish a similar result, are slower and have inherent scalability problems compared with the Napster centralised model (Ritter 2001; Sripanidkulchai 2001).

#### **4. NETWORK EFFECTS FOR THE NAPSTER NETWORK AND THE FOR MP3 FORMAT AS A DE FACTO STANDARD**

*Network effects for the Napster Network.*

The value of connecting to a network depends on the number of other people already connected to it. Terms such as network externalities, network effects and demand side economies of scale all designate this concept (Shapiro and Varian 1999). Metcalfe's law says *that if there are  $n$  people in a network, and the value of the network is proportional to the number of other users, then the total value of the network (to all the users) is proportional to  $n \times (n - 1) = n^2 - n$ . Therefore a tenfold increase in the size of the network leads to a hundredfold increase in its value* (Gilder 1993; Shapiro and Varian 1999). Napster's greatest strength was in its massive numbers of users, averaging 1.67 million people at any given time in March 2001<sup>4</sup>. New networks would have to overcome the competitive advantage gained by the original Napster thanks to network effects.

Due to these network externalities. Napster has created an important positive feedback loop (Shapiro and Varian 1999) both for itself and for the MP3 format. Positive feedback is a term borrowed from control engineering, and when applied in this case it means that something large will get even larger. Napster was able to grow to 20 million users within a year of its initial release, without spending any money on advertising (Limewire 2001). This made Napster grow to be the biggest music-trading network and created an impressive brand name. Users wanted to join the service where more people were sharing files, as it would have more variety of music available, therefore they would join the Napster network because it was the biggest, in turn this would increase the network's value even more and attract more users. In reality Napster had many servers and users were only connected to a given server at a given time and they could only access the music listed in that particular sever, and not all the music in the whole Napster network, but as many uses ignored this fact and it did not affect its growth.

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<sup>3</sup> A higher bitrate will result , if other factor remain the same, in an increase in quality.

<sup>4</sup> According to research firm Webnoize. Borland, J. (2001). Will ISPs, PC makers feel Napster's pain? [CNET.com News](#).

*MP3 positive feedback. MP3 as the de facto standard.*

The MP3 music format was already the most popular format for the transmission of digital music before Napster and similar networks became widely used. As mentioned before, MP3 files could be found on the internet but the search costs were high, which limited the rapid adoption of the format. MP3 popularity greatly benefited from Napster's positive feedback growth.

Additionally, MP3 is an open format and an open technology can more easily fuel positive feedback loop (Shapiro and Varian 1999). This openness meant that from the beginning there has been a large availability of, often free, software for playing and encoding audio CD tracks into MP3 format. Demand side economies of scale also affect the way people buy customer electronics (Shapiro and Varian 1999) in this case portable MP3 players. Buyers avoid products that are not based on a standard or a technology likely to become one, as their equipment would lose a lot of its value if that technology was not ultimately successful. For example Sony solid state music players based on Sony's proprietary ATRAC3 music format instead of MP3, lacked huge popular acceptance unlike other Sony portable audio products (Borland 2001b). Therefore, as more MP3 players are sold the MP3 format becomes more popular and strengthens its position as a standard.

The positive feedback created by these factors made MP3 the de facto standard and eventually gained support from Microsoft, RealNetworks, and America Online (AOL)<sup>5</sup>. In contrast, the opposite effect, negative feedback, acted against other formats like liquid audio and AT&T's a2b, which at this time have minimum user acceptance.

*Switching costs and technology Lock-in for the Napster Network and the MP3 format*

The success of MP3 and the Napster network have created significant switching costs, both individual and collective (Shapiro and Varian 1999), to move away from both Napster, the MP3 formats and digital music files in general. This cost will produce a lock in effect that will tend to keep many users attached to Napster and the MP3 format.

Individual switching costs for Napster users include the costs of looking for a new software and service, test it and compare it with others. Furthermore, to download, store and listen to digital music files, consumers have purchased an array of hardware and software: improved speakers, CD writers, larger hard drives and in order to download digital music faster, many users considered a high-speed cable modem or DSL connection (Borland 2001).

Switching costs could be less severe for the MP3 format as long as most software and hardware players would continue to support the format. However, new protected formats may be imposed into new hardware players and even in PCs with the use end-to-end encryption techniques such as the Secure PC initiative (England 2001; Lettice 2001; Borland 2001c). In this case switching costs would be higher, as many consumers invested in expensive portable MP3 players (Borland 2001), some of

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<sup>5</sup> Which purchased Nullsoft, makers of Winamp.

which cannot be upgraded for new formats. But even if new devices are backwards compatible a standard is still desirable, for example for music streaming over the internet. Individual switching costs to these new formats, in terms of time and effort for users, could be high as it would involve converting music collections to the new format or even purchasing music that had previously been obtained for free. The inconvenience of converting data to new formats will only increase with time (Shapiro and Varian 1999) as more people create large MP3 based music collections.

There would also be large collective switching costs of the Napster community if it decided to move to another network or for MP3 users to move to another format. As exposed by Shapiro and Varian "*collective switching costs work in a non linear way: convincing ten people connected in a network to switch to your incompatible network is more than ten times as hard as getting one customer to switch*" (Shapiro and Varian 1999). But you as Shapiro also states, most of the customers, in this case Napster users, are needed as "*no one will want to be the first to give up the network externalities and risk being stranded*".

Collective costs of defining a new leading network which can take advantage of the network effect previously mentioned, or finding a new de facto music standard, would require a relatively long time as it is hard to coordinate this effort among millions of users with no real means of communication or organised decision making mechanisms. Precisely because various users find it so difficult to *coordinate* a switch to an incompatible technology, control over a large installed base of users is one of the greatest assets Napster has (Shapiro and Varian 1999).

Any attempts by the Music Industry to move away from the MP3 format and from Napster's original form would have to find a way to ignite a new positive feedback loop (Shapiro and Varian 1999) for the alternative. This would have to follow either an evolutionary strategy, providing users with a controlled migration path to a new format or a revolutionary strategy, creating a striking new technology that would clearly provide users with substantial advantages over the existing technologies (Shapiro and Varian 1999).

An evolutionary path to new trading networks is being attempted by providing access to the Napster Network as well as the new network, for example many Open Napster network clients allow this. However these are not legitimate music industry networks and they are probably more likely to be designed to avoid law enforcement. As a result, the only evolutionary approach to move away from Napster is not being taken up by the music industry.

An evolutionary path away from MP3 is being attempted by Microsoft. Microsoft provides Audio Converter with the new version of Microsoft Media Player (which also plays MP3 files), this program, allows users to convert their MP3 collection to Windows Media Audio (WMA) format, which Microsoft claims offers similar quality than MP3 with smaller file size. WMA files incorporate some right management protection, however users can convert previously illegally acquired MP3 files to the new format. This allows users to play and keep their existing MP3 files while being able to discover the advantages of the new format.

A revolutionary strategy to beat Napster seems hard to find. Providing reliable downloads at a higher speed is hardly revolutionary. It is more an evolutionary step for the music industry in an attempt to introduce a new network or changes in the existing Napster network. Napster was a revolution in itself and it takes time to be able to complete a new technological revolution.

A strategy based on introducing a new revolutionary format, would have to provide a product offering either a much higher music quality of a much smaller file size. For the moment, there is a limit in the compression that can be achieved, especially without demanding much higher processing power to decode the file. Also with decreasing prices for storage, a decrease in size alone provides only a limited benefit. Higher quality would require larger files, and MP3 encoder already allow to do this by encoding at a higher bitrate. Moreover any significant quality improvements may be hard to perceive for the average user considering the limitations of the audio equipment present in most computers.

Furthermore, encryption and digital rights management schemes like SDMI, included in previous and possibly future industry sponsored formats, may result lower interoperability with a range of playback devices and in a more a difficult consumer experience rather than an improved one. (Pidgeon, Sinnreich et al. 2000) Therefore it seems that the music and recording industry is not in a good position to do a *performance play* (Shapiro and Varian 1999)(p.204-205) and introduce a new superior but protected and incompatible format.

## **5. SHARING COMMUNITY, ONLINE-VIRTUAL COMMUNITY.**

According to Napster's own website, "Napster is the world's leading file sharing community" (Napster 2001). It is then a particular kind of online community, based around music and about sharing this music. These kinds of networks share many characteristics with more traditional virtual communities. In fact Shawn Fanning, the creator of Napster combined the practicality of sharing personal music and finding MP3s online with the community features he enjoyed in Internet Relay Chat (IRC) (Napster 2001). Napster should be seen as a community, but one more pragmatic than more traditional virtual communities such as the WELL, Usenet, IRC etc.

It is complex issue to define a virtual community and an agreement has not yet been reached. It is explained in different ways, from the idealistic ideas about the value of virtual communities from Rheingold (Rheingold 1993) derived from the WELL to the call for a rethought and redesign by Katz (Katz 2000). This essay argues in favour of a wider definition of community and of the value of virtual communities as a business instrument defended by Hagel (Hagel and Armstrong 1997).

The first two entries of "community" in the American Heritage Dictionary define it as 1.) a group of people living in the same locality and under the same government; and 2.) a group of people having common interests. Extrapolating Coate's analysis of the new wider use of the term virtual community (Coate 1992,93,9898 #36), the "locality", in the definition is comparable to the Napster network. Considering the rules of the network both implicit ones about sharing some music and the official ones in the Terms and Conditions agreement of Napster service, could be considered as a kind of government. The second part of the definition referring to "common interests", would refer to the

shared interest in music (or *free* music). Moreover, the Merriam-Webster dictionary adds the need for interaction and defines community as “an interaction population of various kinds in a common location”(Wagner 1997). This adds the interaction which Napster and most similar services, provide to their users by creating forums to communicate their interests and tastes with one another via instant messaging, chat rooms, and Hot List user bookmarks. Hence, Napster exists as an information exchange, but also build into its architecture personal communication component (Katz 2000). Therefore, according to these definitions, it seems clear the Napster network fits the definition of community, and this community is, of course, an online community.

Napster's has created this community around a music trading network and around a way of understanding music distribution that will be impossible to disregard. It is hard to disband a community. Napster users are now used to this new way of sharing music and some members even take it as a political issue. Any drastic attempt to disband the community could possibly create forms of radicalism defending the ways of the community. For example the creation of de-centralized network could be seen as a way of defending Napster's original idea. Even if the community loses its “locality” previously mentioned in the definition, in this case the Napster network in its original form, there is a possibility that this community will move to another “land”, that is, an exodus from their original Napster “land” to another network or to a diaspora in other scattered smaller trading networks. Therefore any possible change introduced to the original form of the sharing network, should be small and reasonable enough to not alienate this community forcing it to migrate to other services or networks. In this way, the music industry could take advantage of the immense potential that a virtual community can bring for their business (Hagel and Armstrong 1997).

## 6. CONCLUSION

When Shawn Fanning, the creator of Napster released the first version to share music with his friends at Boston's Northeastern University he may not have considered all the concepts discussed here. However, Napster actually takes advantage of, and in some cases even creates, many of the concepts believed to be the keys for success in the so-called digital economy.

Napster in its original form has been amazing successful and sharing networks have become the new “killer-app” of the Internet. Some of the most significant reasons for this success have been discussed in this essay, always leaving to one side the fact that Napster provided something for free that was previously not.

Napster is a simple user-friendly service, for a simple digital good, which can be enjoyed using current computers. But this is also a popular digital good, appealing to every human being, but in particular to the people who can use the internet and who are attracted by its rebel image.

Napster has created a very efficient online music market, although at this point it must be admitted that the fact of not paying per product downloaded significantly erases market friction by reducing the

risk factor to simply wasting some time in a bad download. A negative sub-product of this efficiency is that it often makes users forget that they may be committing an illegal activity by downloading copyrighted material. Moreover, the success of Napster and the MP3 format have been tightly linked together. Napster helped spread digital music and the MP3 format to millions of users. The large availability of music in this unprotected format is likely to create significant barriers to possible attempts to incorporate protection into digital music. The music industry will have to learn to accept the inherent insecurity of digital distribution as it adapted to previous technologies in the past. I will have to try to find a *sweet spot* (Graves and McAteer 1999) that finds a balance between protection and a degree of uncontrolled distribution that allows a fast market growth. Some software vendors have been very successful in doing this although it is harder to control the level of security in digital content than in software.

Napster has also created an important community around its network. This community will guarantee that the idea of music trading networks will not disappear. The music industry has lost invaluable time and resources in litigation against Napster trying to stop this idea. Only recently has the industry started to become aware that if the power of the trading network can be harnessed for their advantage (Harding, Abrahams et al. 2001 and The Economist 2001), it has the potential to revolutionise the music market.

The main conclusion that can be drawn from this analysis is that non-piracy related factors account for a significant part of the overall success achieved by Napster. For this reason, the service should be able to survive some form of reasonable payment, which only affects the piracy element.

Similar forms of payment have worked in the past; for example, email, the most successful service derived from the internet, allows the exchange of messages between users for free. Yet, ISP charges have not affected the success of email.

However, if new industry supported services, in an attempt to impose too much control over distribution, differ too much from the original ideas of the original ideas of the music trading networks, there is a risk of alienating customers which could move in considerable numbers to other services far harder to regulate than Napster.

## 7. GLOSSARY OF TERMS AND ACRONIMS

A2b - a2b music files and streaming audio, a file format created by AT&T Labs that is based on MPEG-2 AAC. The a2b format is based on MPEG-2 AAC, the latest MPEG audio algorithm and the successor to MPEG-1 layer 3 (MP3). It provides superior audio format to MP3. The a2b format also provides copyright protection for music producers.<sup>6</sup>

ATRAC3 - Adaptive Transform Acoustic Coding<sup>7</sup>. Used in MiniDiscs and Sony solid-state memory walkmans.

Bitrate - Denotes the average number of bits that one second of audio data will consume<sup>8</sup>.  
CD - compact disc, a disc capable of storing digital information. The most prevalent types of compact discs are those used by the music industry to store digital recordings and CD-ROMs used to store computer data<sup>9</sup>.

DAT - Digital Audio Tape, a type of magnetic tape to record data. Like other types of tapes, DATs are sequential-access media<sup>10</sup>.

DSL - Digital Subscriber Line.

FTP - File transfer protocol.

IRC - Internet Relay Chat.

Kbps – Kilo bits per second (measure of *Bitrate*).

MiniDisc (MD) – Sony's recordable Magneto Optical discs for music recording and playback.  
MP3 – MPEG-1 Layer 3.

MPEG - Moving Picture Experts Group.

The WELL - Whole Earth electronic Link<sup>11</sup>.

Usenet - A worldwide bulletin board system that can be accessed through the Internet or through many online services. The USENET contains more than 14,000 forums, called newsgroups<sup>12</sup>.

Winamp – One of the most popular MP3 player programs. It supports several formats: MP3/MP2 (MPEG audio layers 1, 2, and 3), MOD/S3M/XM/IT (digital synthesized music formats), MIDI/MID

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<sup>6</sup> From a2bMusic, a2bmusic.com

<sup>7</sup> From Sony.com

<sup>8</sup> From Webopedia (internet.com)

<sup>9</sup> From Webopedia (internet.com)

<sup>10</sup> From Webopedia (internet.com)

<sup>11</sup> From Well.com

<sup>12</sup> From Webopedia (internet.com)



(musical instrument digital interface) , WAV/VOC (digital audio file) , CDA (compact disc audio) , WMA (Windows Media Audio) , AS/ASFS (Audiosoft secure MP3 file)<sup>13</sup>

WMA- Windows Media Audio

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<sup>13</sup> From Winamp.com

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On cover page: music, *Suite Española (Asturias)* by Issac Albéniz. Napster Logo.