

Chapter Nine

Protecting Innovation

The Digital Music Distribution Revolution^a

Fraunhofer and MP3

In 1991, Fraunhofer IIS of Germany developed an algorithm that would set in motion a revolution in how music was distributed, stored, and consumed. The algorithm (commonly referred to as a codec) allowed compression of digital audio to approximately one-tenth of its original size with minimal compromise in audible quality. The format also enabled song information such as the song title and artist to be embedded within the file. This format for compressed audio files was later dubbed MPEG-1 layer 3—a.k.a. MP3. By 1995, software programs were available that enabled consumers to convert tracks from compact discs to MP3 files. This technology transformed how music could be manipulated—a song was now a file that could be kept on a hard drive, and the file was small enough to be shared over the Internet. The MP3 format became wildly popular by users sharing their music online, and software companies began releasing many variants of MP3 encoders (utilities that compress files into MP3s) and decoders (utilities that play back MP3s). Hardware manufacturers decided to capitalize on this new trend and several hardware MP3 players began appearing on the market.

With the growing popularity of the file format, Fraunhofer was faced with a dilemma—should it enforce its patent on the use of the MP3 algorithm and attempt to collect royalties for its use, or should it allow users and software/hardware manufacturers to make free use of the algorithm, allowing the momentum of the format to build? If it was to limit the use of the algorithm, it faced the risk of established rivals such as Microsoft and Sony developing competing formats, yet if it allowed free use of the algorithm, it would be difficult to profit on its invention.

Fraunhofer decided to pursue a partially open licensing approach, partnering with Thomson Multimedia as the exclusive licensing representative of MP3 patents in 1995.^b Thomson, in turn, negotiated agreements with several companies including Apple, Adobe, Creative Labs, Microsoft, and many others. Such a broad base of MP3 licensees (100 by April 2001) provided consumers with easy access to encoders, decoders, and the format in general. Licensees generally

opted to provide decoders free of charge, while charging a nominal fee to those who wished to encode MP3s.

Fraunhofer continued to innovate, introducing the mp3PRO format and working on the Advanced Audio Coding (AAC) format with Dolby that Apple would later use. Many other companies also developed or adapted their own audio compression codecs including Sony (ATRAC codec, originally developed in 1991 for use with Mini Discs^c) and Microsoft (WMA, launched in April 1999^d). However, by 1996, MP3s could be found on computers worldwide, and it appeared that MP3 had won the battle for dominant design in compressed audio formats.

Napster Takes the Lead

In 1999, while a student at Northeastern University in Boston, Shawn Fanning released Napster—a software program that allowed users with Internet access to easily share MP3 files. Napster provided a user-friendly solution to music fans wishing to share and find music online. Napster provided a user interface with a search box that pointed individuals to other users with the files they wished to download. The Napster servers did not host any MP3 files; rather they hosted a database with information on which users had which files to share and whether they were online, and connected one computer to another for downloading. Napster was one of the first widely adopted “peer-to-peer” applications, and helped popularize the term.

Napster was free, and as the growing number of people with Internet access realized, so was the music that it allowed them to access. Users were increasingly trading copyrighted material—commercial records and songs. In fact, the great majority of music downloaded through Napster was copyrighted material. By March 2000, 5 million copies of Napster had already been downloaded.^e At its peak, there were 70 million Napster users.^f

While “music pirates” around the world embraced Napster, the Recording Industry Association of America (RIAA), the trade group that represents the leading music business entities in the United States, grew increasingly alarmed. The RIAA worried that the growing illegal trade of music would result in a loss of profits for its constituents—record labels that owned the rights to much of the popular commercial music that was being traded online. The RIAA initiated legal action against Napster and Napster users in an effort to take the service offline and curtail illegal file sharing. This move was controversial for several reasons. Some analysts believed that it would be difficult to fight a technological advance such as this by legal action alone, and that the RIAA would not be successful unless it offered a legitimate alternative for users who wished to purchase music online. Other analysts took an even stronger stance, arguing that the record labels were not only fighting to protect the rights of artists, but to protect a business model that had become outdated.^g They argued that the popularity of Napster was partially due to the rigid and overpriced traditional music distribution model, where fans were forced to buy albums for prices that some felt were inflated, and did not have the choice to buy individual songs. This was not the first time the entertainment industry had resisted a change in business models and was reluctant to embrace a new technology. A 2001 article in *The Economist* pointed out that “Phonographs were going to kill sheet music, the rise of radio threatened to

undermine sales of phonograph discs, video recorders were going to wipe out the film industry, and cassette recorders spelt doom for the music business. . . . In each case, their fears proved unfounded. The new technologies expanded the markets in unprecedented ways."⁶ Some commentators believed that the new technology could be beneficial for the recording industry. If harnessed appropriately, it could enable an inexpensive distribution method, as well as direct intimate interaction with consumers that allowed for targeted marketing.

In 2001, Napster offered the RIAA a partnership that included a legitimate digital distribution model that would make online music available via a subscription service. The RIAA declined, and instead continued to pursue a legal judgment against Napster. In July 2001, the court ruled in the RIAA's favor, and the Napster service was taken offline. It was a blow to peer-to-peer fans worldwide.

Though the record labels had won the battle against Napster, they began to realize the war was far from over. Services similar to Napster began to sprout up online, offering "users in the know" the opportunity to continue pirating music. The record labels continued to pursue legal action against peer-to-peer services and users who engaged in illegal file trading, while coming to terms with the need to offer a legitimate alternative service. Subsequently, Warner Music teamed up with BMG, EMI, and RealNetworks to introduce MusicNet, and Sony Entertainment and Universal created Pressplay, both of which were subscription services that enabled individuals to download music legally from the Web. However, in an attempt to control their music catalogs, the labels used proprietary file formats and severely limiting digital rights management (DRM) schemes that confused users. Furthermore, neither service offered the breadth of selection offered by unauthorized peer-to-peer services such as Kazaa or Gnutella. The popularity of peer-to-peer music swapping continued to grow. The RIAA needed a savior. Steve Jobs offered to be that guy.

iTunes Just in Time

On April 28, 2003, Apple opened its iTunes Music Store. After striking agreements with the five major record labels (Sony, Universal, BMG, Warner Music Group, and EMI), iTunes launched with an initial catalogs of 200,000 songs for purchase at 99 cents per song.⁷ iTunes showed immediate signs of success, boasting 50 million downloads within the first year, and quickly became the leading distributor of music online.⁸ Apple got the blessing of the recording industry after guaranteeing them that the files offered via the Music Store would allow for protection against illegal sharing thanks to the "FairPlay" DRM scheme. In essence, the iTunes Music Store offered audio in two file formats—Advanced Audio Coding (AAC) and modified MP3s. With Apple's Fairplay DRM, song files could be loaded on up to five computers only, and could not be played on non-iPod MP3 players. In addition, the files could not be e-mailed or distributed over the Web, and files were "hidden" on the iPod through a subdirectory structure that made it difficult to copy songs from a friend's iPod. All of these features helped to prevent users from mass-distributing songs to others, helping to ease the minds of record company executives.

The success of iTunes was fueled by a number of factors. The company had a "cool" image that was attractive to the recording industry and users alike.

The company also used the familiar MP3 format, offered an attractive price tag for online music, and its licensing agreements with all five major labels enabled it to offer a one-stop source for customers. In addition, the FairPlay DRM was not as restrictive as other competing formats,^k and this was important to many users. The success of iTunes was also accelerated by the success of Apple's iPods. iPods are hard-disk-based portable MP3 players that are well designed, well marketed, and user-friendly. Though there had been some criticisms concerning their dependability (chiefly related to battery life)^l and sound quality issues,^m casual music consumers took to these players in large numbers. To the appreciation of the RIAA, the iPods required synchronization with one's music collection via the iTunes application, thereby making it difficult to share music stored on the iPod, or purchased from iTunes.

The recording industry had found a new channel of distribution that earned significant revenues (about \$0.70 of every \$0.99 sale on iTunes is delivered directly to the record labelsⁿ), and Apple had licensing agreements with all the major labels, which afforded Apple access to huge catalogs. Apple leveraged these catalogs to entice users to buy music through its iTunes Music Store, and this in turn helped drive sales of the Apple iPod, since files bought on iTunes could not be played on rival MP3 players. Apple was well positioned, but threats loomed on the horizon.

In March 2006, the French National Assembly approved a bill requiring Apple to open its FairPlay DRM technology to industry rivals in France.^o This meant that Apple would have to allow songs downloaded from the French iTunes Music Store to be played on non-iPod MP3 players, and that iPods would need to play competing file formats, such as Sony's ATRAC3 files purchased through the Sony Connect online music store. Many users could appreciate this interoperability, yet it would challenge the "single operator license model" that had eased the minds of the recording industry and created a large and loyal customer base for Apple. Initially analysts speculated that Apple would withdraw from the French market, but instead Apple began working on negotiating fewer DRM restrictions from the record labels. By March of 2009, Apple had convinced all the major labels to permit their songs to be sold through iTunes without DRM. In return, Apple adopted the tiered pricing model that the major labels had long requested.

The rise of smartphones that could hold users' music digital libraries in addition to offering a host of other useful functions helped to fuel the growth of digital music sales. By 2011, digital music sales exceeded physical sales in both the United States and South Korea, and by 2016 digital music sales exceeded physical music sales in roughly half of the major music markets of the world.^p However, an even bigger transition was also changing the landscape of music. Rapidly growing services such as Spotify, Pandora, and Apple Music were now streaming music over the Internet, enabling listeners to hear whatever music they wanted, whenever they wanted, on a wide range of devices, without the user ever taking ownership of the music. Though many had feared that a transition to streaming would be disastrous to the recorded music industry, instead paid music streaming subscriptions fueled record-setting market growth. In 2016, the global recorded music market grew by almost 6 percent—the highest rate since 1997—to a total of US\$15.7 billion.

Discussion Questions

1. What industry conditions led to the revolution in audio distribution described above? Which stakeholders stand to benefit most (or least) from this revolution?
2. Why did the music stores created by the record labels fail to attract many subscribers? What, if anything, should the record labels have done differently?
3. What factors led iTunes to be successful?
4. How do you think a move away from owning music led to record-setting music revenues?

^a Adapted from a New York University teaching case by Shachar Gilad, Christopher Preston, and Melissa A. Schilling.

^b "Thomson Multimedia Signs 100th mp3 Licensee," press release (PR Newswire), April 18, 2001.

^c Junko Yoshida, "Sony Sounds Off about Mini Disc," *Electronic World News*, no. 41 (June 3, 1991), p.15.

^d Jack Schofield, "Music Definitions," *The Guardian*, October 5, 2000, p. 3.

^e Karl Taro Greenfeld, "The Free Juke Box: College Kids Are Using New, Simple Software Like Napster to Help Themselves to Pirated Music," *Time*, March 27, 2000, p. 82.

^f Michael Gowan, "Easy as MP3," *PC World* 19, no. 11 (November 2001), p. 110.

^g "The Same Old Song," *The Economist* 358, no. 8210 (January 24, 2002), pp. 19, 20.

^h *Ibid.*

ⁱ Michael Amicone, "Apple Took a Big Bite Out of the Market," *Billboard* 116, no. 16 (April 17, 2004), p. 2.

^j "iTunes Music Store Downloads Top 50 Million Songs," press release, March 15, 2004.

^k *Ibid.*

^l "Apple Faces Class Action Suits on iPod Battery," *Reuters*, February 10, 2004.

^m Randall Stross, "From a High-Tech System, Low-Fi Music," *New York Times*, July 4, 2004, p. 3.

ⁿ Alex Veiga, "Recording Labels, Apple Split over Pricing," *Associated Press*, April 2, 2006.

^o Rob Pegoraro, "France Takes a Shot at iTunes," *WashingtonPost.com*, March 26, 2006, p. F06.

^p International Federation of the Phonographic Industry Global Music Report 2017.