

Digital Music Distribution



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Executive summary

The digital distribution of music grew out of the unauthorized file-sharing phenomenon of the late 1990s. As peer-to-peer networks gained popularity, a digital music value chain emerged comprised of file sharing software, Internet connectivity, personal computers, jukebox software, portable MP3 players, and a community of users providing content. These components were interchangeable and assembled at each user's discretion, providing a loosely-coupled infrastructure for the distribution and consumption of unprotected music files at a scale that quickly took the practice outside the realm of fair use.

Legal action by the Recording Industry Association of America (RIAA) and other entertainment groups led to innovation in two opposing directions. On the one hand, unauthorized networks found more effective ways to circumvent authority. On the other, the authorized online music market was born, distributing protected content using digital rights management (DRM) technology.

DRM has been used as a key strategic mechanism for tying content to different components, introducing pockets of scarcity in the value chain. Two key business models emerged from the first wave of authorized services: device centric and software centric. The former is the near-exclusive domain of Apple's iTunes Music Store (iTMS) and the latter comprises online stores selling music supported by Windows Media Player (WMP). More recently, mobile carrier services have added a third category of business model; network centric, where both the portable player and content are tied to the delivery channel (the carrier's network). This latter trend not only increases instances of scarcity in the value chain, it also shifts certain aspects of control back to network operators.

Released in 2003, the Apple's iTunes Music Store dominates the authorized digital marketplace with 80% market share in the U.S. in 2005.¹ As a device manufacturer, the company's business model was predicated on the highly successful iPod, which had been released 2 years before the iTMS. Apple leveraged the iPod's icon status and made it a major control point in the iTMS value chain by providing a streamlined channel that tied content to the portable player through its proprietary DRM technology, FairPlay. Thus, while the iPod was initially marketed as an open MP3 player that supported unauthorized digital music, it is now the exclusive portable device for iTunes content.

Two key trends threaten the iTMS model: the growth of the WMP-based player market, and the rise of the music phone as the portable playback device. As mobile networks improve, music phones may also complement the personal computer as the primary sourcing device, thereby competing with online distribution channels in general and capturing value from traffic that up until now by-passed mobile networks.

Introduction

While the Internet has become a well-established marketing channel for CDs, the actual delivery of music files online has lagged behind and followed a far more controversial path.

Over the last five years, digital music distribution has become a new communication service, where digital files are delivered over various networks to computing devices that enable users to shop, store, manage, and play music files, as well as copy, share, redistribute, and even modify them.

The digital music case study traces the evolution of this new marketplace from its roots in the illegal file sharing phenomenon to the emergence of legal download services, the almost instant dominance of Apple's iTunes Music Store (iTMS), and the threats to its leadership.

The focus is specifically on the retail aspect of the music industry; the procurement and consumption of music (i.e., it does not look upstream to the traditional creation/production activities in the music value chain or promotional channels including radio and television).

The value chain dynamics of competing business models are examined, along with the forces triggering new models, and the domination of one model over another. Applying key concepts from the Core-Edge methodology of the Value Chain Dynamics Working Group, the analysis will focus on how and where in the digital music value chain different players in competing services are capturing value.

A brief history of digital music distribution

Digital music distribution services grew out of the unauthorized file-sharing phenomenon of the late 1990s. Music downloading emerged as an efficient method for sharing personal music files given several preconditions: 1) advances in audio compression technology 2) end-user resources including PC storage capabilities and enough processing power to rip, burn, and play music files 3) high speed bandwidth access among a community of end-users, and 4) the practice of ripping and burning CDs within that community.

File sharing communities were first formed around centralized downloading sites like MP3.com where ripped files were uploaded and then downloaded by other users.² The inefficiency of this method was quickly remedied by Shawn Fanning's landmark P2P software, Napster, released in the fall of 1999. Files could now be exchanged directly between users rather than passing through a centralized intermediary, while a centralized index of available content gave users an efficient way of finding music. The P2P network proved efficient enough to quickly push file sharing activity beyond the realm of fair use,

rendering it illegal. The RIAA sued Napster within a few weeks of its launch, and because it operated the centralized directory that listed available unauthorized MP3 files, the file-sharing company was held legally responsible for piracy.³ Napster, along with the early MP3 Web sites were shut down -- but not before demand for downloading music had been stimulated.

Legal action from the RIAA encouraged innovation in two opposing directions. On the one hand, P2P networks simply got better at circumventing authority. By decentralizing all functionality, P2P services like Limewire, KaZaA, and Grokster eliminated a single point of legal attack.⁴ When the RIAA and the Motion Picture Industry sued KaZaA, Grokster and StreamCast Networks (then MusicCity) in 2001, the P2P services argued that they – unlike Napster -- were not liable for illegal activity that occurred on their networks because they did not manage a centralized directory. In 2003, the courts ruled that the software was not illegal and that the file-sharing companies were not liable for copyright infringement, agreeing with the defendants that these new networks were more like copy machines than Napster's file-sharing service.

For the next two years, P2P networks were deemed legal and the RIAA's strategy switched to prosecuting individual users. Other efforts included subverting P2P networks by seeding them with "dummy" MP3s. In one such instance, Madonna's record label released recordings of her saying "What the fuck do you think you're doing?," onto the KaZaA network -- which were subsequently remixed into new tracks and quickly distributed among P2P users and played in clubs.⁵

P2P networks responded to legal attacks on users by improving methods for circumventing authority. The Earth Station Five (ES5) network, for example, uses 3rd party proxy servers and SSL encryption to transfer files, hiding both users' identity and the contents of transferred files.

After the RIAA appealed the 2003 Grokster decision, the Supreme Court ruled in June 2005 that Grokster was liable for users' copyright infringement and the company closed its site on November 7, 2005. It is not clear what effect the ruling will have on the future of P2P networks, nonetheless it could signal the beginning of a global trend. In November 2005, South Korean courts shut down the country's busiest P2P service following legal action from the Korean Association of Phonogram Producers (KAPP). Australian and Taiwanese courts have also shut down P2P networks.⁶ But the cat and mouse game will likely continue, spurring further innovation in the digital blackmarket, or "darknet" as it has become more commonly known following the publication in 2002 of Microsoft's controversial whitepaper titled, "The Darknet and the Future of Content Distribution."⁷ The authors argue that

“there will be short-term impediments to the effectiveness of the darknet as a distribution mechanism, but ultimately the darknet-genie will not be put back into the bottle.”⁸

The other response to legal action, and the focus of this paper, has been the emergence of authorized services. First on the scene were online stores like Apple’s iTunes Music Store (iTMS) and Roxio’s revamped Napster, which responded to the combined demand for digital music and the heightened risk of illegal file sharing by selling copyright-protected audio files using digital rights management (DRM) technology. With iTMS, consumers purchase individual tracks or full albums, downloading music files directly to their Mac or PC for storage, playback, and subsequent transfer to the iPod. Napster offers a streaming service, as well as Napster-to-Go, where files can be downloaded and transferred to portable devices, with a time-limited license. More recent market entrants include MSN Music and Yahoo! Music Unlimited.

Legitimate P2P services like Wippit⁹ and Altnet also began appearing in early 2004, seeking the benefits of a decentralized infrastructure for file distribution. i.e., scalability, shared storage and bandwidth costs, while maintaining control over copyright using DRM for P2P technology, and assuring consistent, high-quality recordings. These services are a hybrid of centralized and decentralized functions. Most legal P2P distribution services have attracted the smaller, independent labels, as an otherwise prohibitively expensive promotion and marketing opportunity.

Despite the use of DRM, the major labels are still wary of P2P and have not signed any deals with these services. One technology provider, Snocap, however, seeks to change this. Developed by Napster’s Shawn Fanning, Snocap is a music licensing platform for both centralized download stores and P2P networks. Songs are uniquely identified using Snocap’s fingerprint technology, and registered with the company’s database. The system scans music files as they are copied and matches them to a centralized database of registered songs, registering royalty payments and applying usage rules as specified by the copyright holder. Snocap has signed deals with major record companies including Sony BMG, Universal, and EMI. Mashboxx was the first service to use Snocap’s technology, having released a beta version in May 2005.¹⁰ (Snocap’s DRM is similar to that used in Wippit and Altnet’s P2P services.)

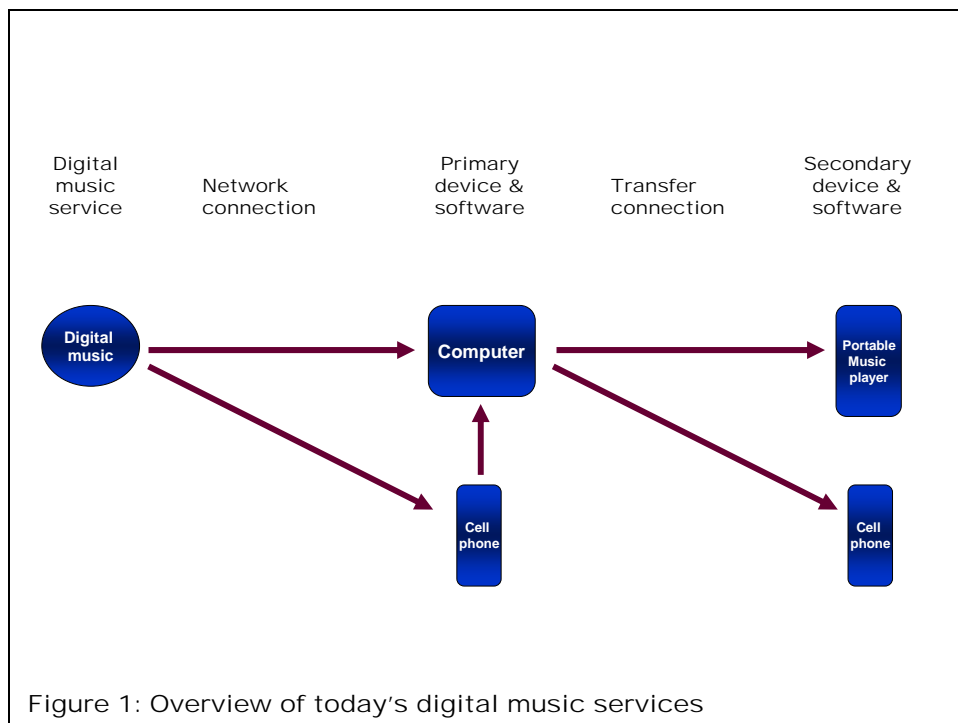
Although most, if not all, DRM systems have been cracked, the primary goal of these newer legitimate services is to provide a convenient way to legally obtain digital music files at a reasonable price, while offering superior quality content. These market-based solutions presume that given the choice, users will choose a legal option if it’s easy to use and the price is right.

Up until early 2005, the key issue in digital distribution was the ability of the legal online services to “compete with free.” But as the legal market evolves, mobile (wireless) music has been added to the digital music market agenda. More specifically, the cell-phone has entered the digital music value chain as a destination device for content, but from two different – competing – channels.

On the one hand, music phones are plugging into the value chain of PC-based online services as a portable listening device via wired and/or wireless connections like USB cable or Bluetooth, and competing with portable music players. Today’s built-in music players have less functionality and less storage than dedicated portable music players, but as they improve, they may prove a more attractive option to carrying two devices.

On the other hand, mobile operators in Europe and Asia have started offering music downloads and streaming directly to cell phones over their cellular networks. Sprint Nextel introduced a mobile download service on October 31, 2005; the first of its kind in the U.S.

The result is several competing digital music models. These are illustrated in Figure 1. The most popular models are Internet-based downloads to the PC that include the option to transfer files to a portable music player and/or a cell phone. Mobile services offer direct over-the-air downloads to cell phones, with the ability to transfer tracks to a personal computer. Some mobile services send music tracks to an email address. Mobile versions of online stores can also be accessed via cell phones over the wireless Web.



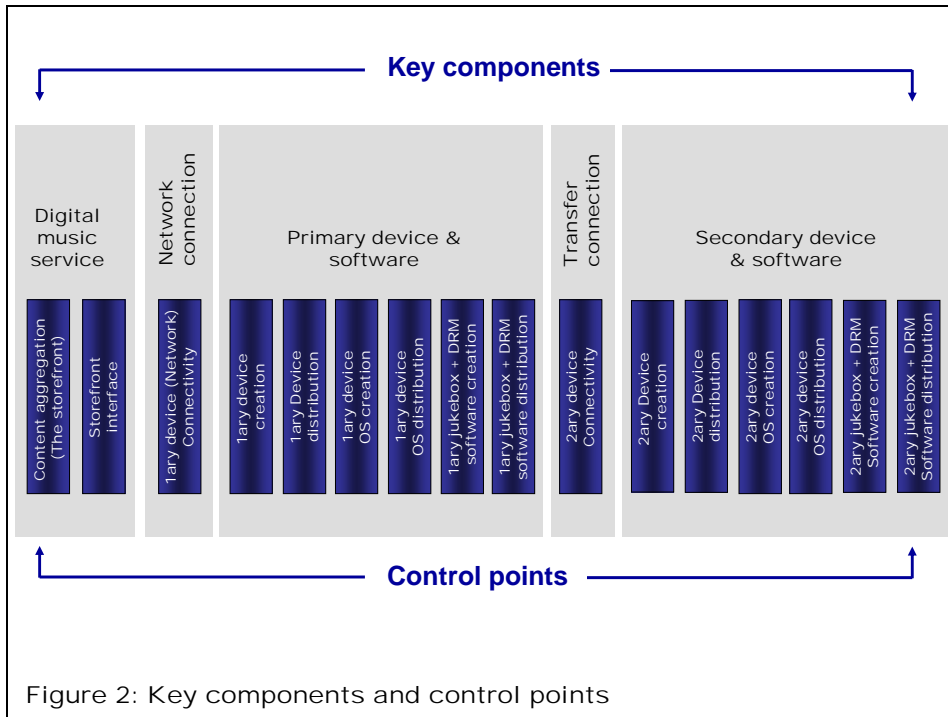
Control points in the digital music value chain

In this next section, we will apply the Core-Edge methodology and examine the various models at a greater level of detail. At a very basic level, the Core-Edge methodology breaks down a communication service into a series of “control points,” and examines their organization into various business models, or what we call “control point constellations.”

Control points are evaluated primarily in terms of their “scarcity,” where scarcity refers to the non-interchangeability of a service transaction with that of another provider. Scarcity is a measure of the number of possible players in the market. Scarcity can be high or low, where 100% non-interchangeability represents monopoly conditions (and therefore one or few players), and low scarcity (high interchangeability) represents commoditization (and therefore as many players as the market can support). Business models vary in terms of where scarcity exists in the value chain, why it exists, and the degree to which it exists. Scarcity is an important strategic property because it determines where value can be captured (or not) in the value chain, and who has control over that value (and who doesn’t). Scarcity is a function of business design, regulation, and/or technological features. It is therefore also a dynamic property, which shifts according to changes in these factors, changing the nature of a given business model.

Control points are also evaluated in terms of demand, defined as the market share that a given control point is able to capture. Demand can be measured in sales units, subscribers or other information.

Figure 2 shows the control points associated with the key components of a digital music service (as outlined in Figure 1). Key components include the music service itself, devices and software, and connectivity. A digital music service usually involves first downloading music to one device, and subsequently transferring files onto another device. The model is therefore based on “primary” and “secondary” devices and their connections. As discussed above, most digital music services today are PC-based, meaning files are first delivered to a personal computer via the Internet, at which point they can be transferred to a portable player or music phone (the secondary device) using a transfer connection such as cable, USB, or Bluetooth. Transferring music from a computer to a cell phone is often referred to as “side-loading.” In the case of mobile services, the music phone is the primary device and files may be subsequently transferred to a PC.



Let us describe the individual control points in more detail:

The digital music service

Content aggregation refers to the catalog or collection of music available for downloading (authorized or unauthorized) from a given service. Record labels effectively own this control point, holding the rights to available music and, in the authorized market, cutting deals that leave very little -- if any -- profit for online music service providers. It is generally known that Apple considers its music store a loss leader.

Quality of content is crucial to any music service and is a key issue in the battle between authorized and unauthorized services. On the one hand, unauthorized services are increasingly plagued with incomplete and mislabeled tracks, low bit-rate files, watermarked recordings, viruses, etc. On the other, the volume and variety of music is reportedly greater than what is available on authorized sites.¹¹

The storefront interface enables user access to the service. Some services, like Sony's Connect are accessible via any Web browser. In other cases, like the iTunes Music Store, the storefront is embedded in proprietary software, i.e., you can only access the iTunes Music Store through the iTunes jukebox software. Similarly, Yahoo!'s Unlimited Music service is accessible via the Yahoo! Music Engine, which, like iTunes, is downloadable for free. In the case of P2P services like Limewire, the P2P network software provides access to the directory of available music. This control point has recently become a concern to some of

the larger providers like Napster and RealNetworks who initially followed Apple's lead in making their services available through proprietary software, but are now switching to a Web-based interface. Despite the overwhelming success of the iTunes service, these providers want to make their services accessible via as many channels as possible.¹²

Network connection

Primary device connectivity refers to the network connection between the service provider and the device that is used to source (select and receive) the files. Users connect and files are transmitted via either the Internet or a mobile phone network, depending on the service. Primary device connectivity is a key control point for mobile services, where both the handset and content are tied to the carrier's network, unlike a fixed online offering where the music service and devices are independent of the network connection (unless the music service provider is an ISP, in which case content would be tied to connectivity).

Primary device and software

The primary device and software can be broken down into 3 subcomponents: 1) the sourcing device used for selecting and receiving files 2) the device operating system and 3) the jukebox or player software client used to organize and play music, which in the case of authorized services includes DRM technology. The associated control points comprise the creation or manufacture of each of these subcomponents, and their distribution.

The creation and distribution of personal computers is a function of that industry's value chain, as is the creation and distribution of operating systems, but digital music is nonetheless subject to its particularities (i.e., a service may only be available for Mac or Windows, etc. while some will work with Windows/Mac or Linux). In the case of cell phones (as both the primary and secondary device), distribution -- at least in the U.S. -- is controlled almost exclusively by the carriers.

Transfer connection

As noted above, most services today involve downloading a file to a personal computer and then transferring that file to a portable device using a cable, USB or a wireless connection like Bluetooth. The transfer connection is a controversial control point because it can enable users to bypass carrier networks when transferring content between handsets. Carriers have responded by disabling such functions or refusing to support devices with certain features. Verizon, for example, disabled the Bluetooth function on one of its Motorola camera phones so that users could only send photos to family and friends using Verizon's data services.

Secondary device and software

Similar to primary devices, secondary devices and software are comprised of three subcomponents: the device itself, the operating system, and the client software. Control points include the manufacture and distribution of personal computers and cell phones, as described above, as well as the manufacture and distribution of portable music players. The creation and distribution of client software for portable devices also closely parallels that of the personal computer industry, i.e., Windows has licensed the WMP software to multiple device manufacturers, whereas iTunes and FairPlay DRM is proprietary and is only supported by the iPod, and more recently Motorola's iTunes-enabled ROKR and RAZR cell phones.

Portable music players are the only device in the digital music value chain that function solely as a secondary device, i.e., music must be transferred to them via a secondary, transfer connection, whereas personal computers and mobile phones can be either primary or secondary devices. The portable player is an important control point for services like Apple's iTunes Music Store and Sony's Connect service where the service provider is also the device manufacturer and is therefore able to capture value from the sale of the devices. In fact, digital music services in general have so far been defined largely in terms of the portable device, the iPod in particular. But the portable device – specifically the hard drive – is a highly commoditized component, and as we will discuss below, it will be difficult if not impossible for Apple to maintain its device-centric strategy and market dominance over time.¹³

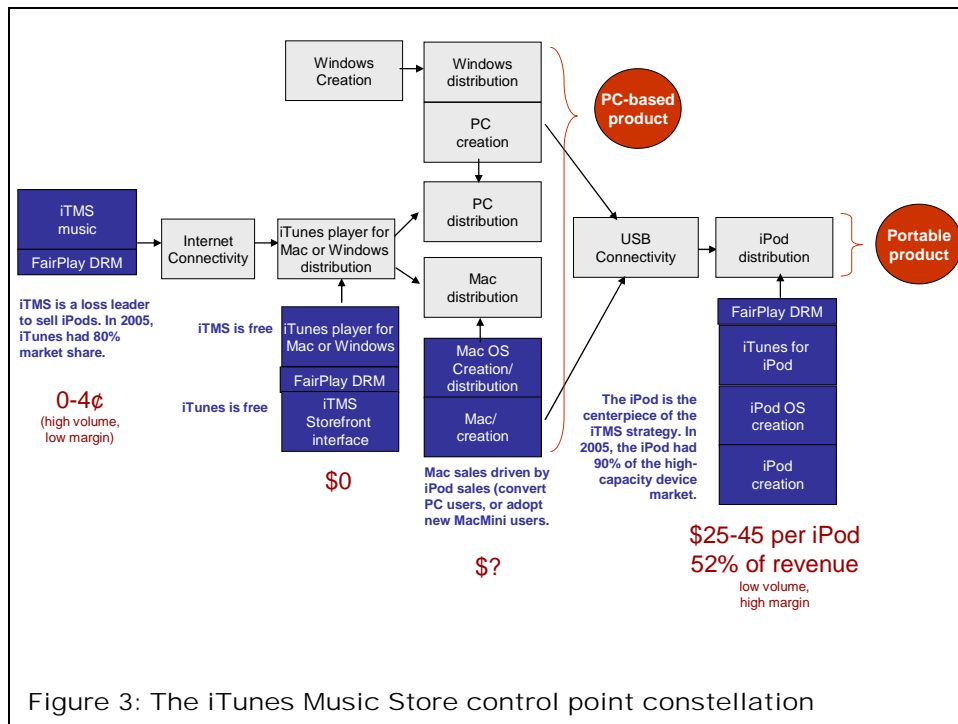
Control point constellations

In terms of the Core-Edge methodology, a digital music business model comprises a particular organization or configuration of these various control points. Business models differ in terms of the relationships between individual control points, how much value is extracted from them, and by which player.

As an example, Figure 3 illustrates the control point constellation for the iTunes Music Store, along with some rough figures for how much value is derived from some of the control points. The darker boxes represent those control points that are owned by Apple.

The diagram shows the relationships between the control points; more specifically, the dependence of one control point on another, or its independence. In other words, where there is tight coupling of control points, or loose coupling. The boxes that are joined together indicate a dependent, tightly integrated relationship. The arrows show how one control point, or bundle of control points flows into another to produce an outcome, or a

“product.” In the case of digital music distribution there are two outcomes: the online iTunes product, and the extended, portable iPod product.

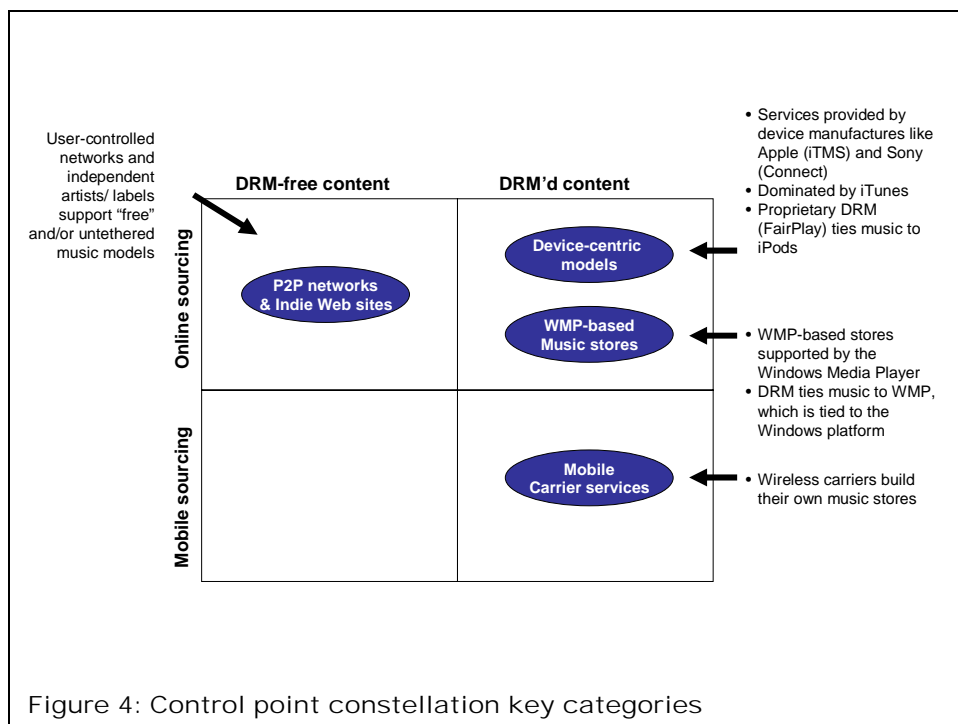


This is actually the 2nd iteration of the iTunes Music Store constellation. The iTunes player software was originally tied exclusively to the Mac. Within a few months, Apple released a Windows version of iTunes, thereby reducing the scarcity of the jukebox software, while opening the market for the iPod to the Windows user base. Apple’s digital music value chain could in fact be viewed as the 3rd iteration of Apple’s digital music value chain, since the iPod originally supported (and still supports) the unauthorized digital music value chain. It also continues to support the “traditional” CD value chain, where personal collections of CDs are ripped and transferred to the device.

With regards to the value of the individual control points, the diagram indicates that Apple makes little to no money on the sale of music, while the iPod is central to the iTunes strategy. With 75% market share of the portable device market in the U.S.¹⁴ – and closer to 90% in the high-capacity (hard drive) device segment (including sales from HP’s branded iPod¹⁵) -- the iPod generates sales revenue while potentially converting PC users to Mac users. Figures for extra revenue derived from this “halo” effect are not available, but Merrill Lynch estimates a 15-20% growth rate for Mac revenue due to conversion,¹⁶ while a survey conducted by Morgan Stanley in early 2005 showed that iPod users had a 19% PC to Macintosh conversion rate.¹⁷ Based on various sales data, bloggers have estimated a

conversion rate of 6%. However, a November 2005 report claims the halo effect is illusory, stating that “while Apple’s shipments have been up for the past four quarters, it is because they are coming off historic lows,” and not driven by converted iPod users.¹⁸

The various digital music services constellations have been categorized into 4 main types, based primarily on how the content from a service is tied to other components, as shown in Figure 4. The horizontal axis of the 2x2 matrix divides digital music services into DRM-free and DRM’ed content, while the vertical axis distinguishes wireless offerings from fixed, online models. The value chain of services offering DRM-free content (whether authorized or unauthorized) tend to be comprised of mostly interchangeable software and hardware components, and the services do not tie content to devices and/or software.



In the case of DRM’ed services, there are 3 main categories including *device-centric models*, *software-centric models*, and *mobile carrier services*. The first category comprises services offered by device manufacturers, including Apple’s iTunes Music Store and Sony’s Connect service. Apple clearly dominates this category. For the purposes of this paper, device-centric models are defined in terms of the portable (vs PC-based) product, as described above, although market share includes sales of tracks for the online product as well (i.e., music that stays on the personal computer, or possibly converted into a FairPlay-free MP3 file and transferred to a non-iPod device). Apple reportedly has 10 million accounts, and has sold 600 million iTunes, but the percentage of the downloaded files transferred to how many iPods is not known.

In this model, proprietary DRM technology ties music to the jukebox software, which is supported exclusively by the portable device manufactured by the service provider. In effect, music is tied to the portable device. For example, music purchased from the iTunes Music Store will only play on iTunes jukebox software, and while the iTunes software is available for both Mac and Windows, the iPod is the only portable music player that supports iTunes and FairPlay, and is at the same time closed to all other sources of DRM-protected music. The Motorola iTunes phones (ROKR and RAZR) have recently been added to the exclusive list of devices that support iTMS. The result is an end-to-end solution that integrates the retail service and the supporting devices and software.

Sony's market share is negligible compared to Apple's. The Connect service has been plagued with problems, mostly related to Sony's SonicStage and DRM software, however analysts expect the re-launched version to be more successful. Nonetheless, Sony has an additional control point, upstream from the retail portion of the digital music value chain, and (for the time being) out of Apple's reach: content creation. Following the Sony/BMG merger, the company now controls 25% of the music market, a position it could use against its rival.¹⁹ The Australian version of the iTunes Music Store launched in October 2005, for example, does not include music from the Sony/BMG label.²⁰

WMP-based music stores distribute content supported by Microsoft's Windows Media Player, (WMP), which is tied to the Windows platform and supported by multiple portable devices. Most online services other than iTMS and Connect sell WMP-based content, including Microsoft's own download service, MSN Music, launched in September 2004.

A variety of players provide WMP-based services including record labels like Virgin Digital, music retailers like HMV, other retailers like Wal-Mart, consumer goods companies like Coca Cola (MyCokeMusic.com), ISPs like Yahoo!, as well as "traditional" digital music retailers like Napster and Real. One exception is device manufacturer Samsung, who in October 2005 announced plans to launch a music service sometime in the near future. Rather than tying content exclusively to its portable player, as Apple and Sony have done, Samsung's service is supported by Windows Media technology -- a "hybrid" strategy that could compete with both Apple's value chain, and all WMP-based services.²¹

Mobile carrier services are similar to the iTunes model in that content is also tied to the handset through DRM, but different in that the carrier is the music service provider, and therefore content is also tied to connectivity. This makes a difference in terms of who captures value and where in the value chain. As noted above, connectivity becomes a key control point in the mobile value chain. Mobile carrier services are currently available in Europe and Asia

where wireless networks are more advanced, whereas the first mobile download service in the U.S. was introduced in October 2005 by Sprint Nextel.

The threat to iPod's dominance

Apple's iTunes Music Store clearly dominates the authorized digital marketplace today. As a device manufacturer, Apple's business model was predicated on the success of the iPod, which was introduced before the iTunes Music Store as an open MP3 player. Apple subsequently leveraged the icon status reached by the iPod, and made it a major control point in the iTMS business model by providing a more streamlined content supply channel to the device via the iTunes proprietary software. The integrated aspect of the iTunes + iPod experience is generally regarded as a key success factor. In effect, the easiest way to fill an iPod with digital music is through the iTunes Music Store – and the *only* way to fill it with authorized online music in particular, is through iTMS. As mentioned above, the iPod continues to support non-iTunes music and in fact, the average user's hard drive is reportedly more than half full of non-iTunes content -- music that has been either ripped from personal collections or downloaded illegally, or downloaded from the various music services that offer DRM-free music.

Continued success of the current iTMS model requires the sustained dominance of the iPod, but several key trends threaten its position. The first is the growth of the WMP-based player market. Microsoft's PlaysForSure (PFS) marketing initiative, which brands WMP-based stores and devices with the PFS logo, could strengthen this trend by creating the perception of an end-to-end solution similar to iTunes, but at a lower price and with more flexibility for users. (Not all users find the integrated aspect of iTunes appealing and one user sued Apple in early 2005 for its "monopolistic practices."²²) Microsoft's Janus DRM technology, which enables portable subscriptions, would further strengthen this trend, unless Apple offers a portable subscription service. Although no formal announcements have been made, rumors have circulated that Apple is considering a subscription service, pending changes to its FairPlay DRM technology for portability, similar to MS DRM.²³

Napster captured the essence of the subscription vs download issue in its 2005 advertising campaign for Napster-to-Go, which illustrates "the math" for 99cent download model vs the monthly subscription fee – fill your iPod for \$10,000 or pay \$15/month for Napster. While the numbers are appealing, it may take consumers a few more years to give up the idea of owning their music. But as listening to digital files on computing devices becomes more popular, the value placed on ownership of those music tracks could wane, possibly in favor

of playlists, or index. In any case, with studies showing that the average iPod contains less than 30 songs, a number that has declined in the last year, no iPod user is downloading close to \$15/month worth of music. According to a report released in July 2005 by the IFPI (International Federation of Phonographic Industry), the subscription model in general is not as popular as expected, however, in terms of revenue, subscription services accounted for 62-95% of singles.²⁴ Most analysts see subscription services staying a niche market.²⁵

Industry pundits, however, believe that Sony and Samsung are the only two true contenders to Apple, based on their strong global brand and additional sources of revenue from other consumer electronics products not enjoyed by the smaller companies like Creative and iRiver.²⁶ Sony's flash-based portable players did beat the iPod Shuffle in Japan this past May and June 2005, but, as one analyst notes, "translating those recent gains into Europe and North America could be tough, with the iTunes + iPod combination a big favorite among consumers."²⁷ Furthermore, the iTunes Music Store was not yet launched at that time.

A more significant trend is the convergence of cell phones and portable music players. As features improve, music phones are expected to replace the iPod – and portable players in general -- as the primary device for mobile *playback*. For the time being, most music phones do not have enough storage to compete with the iPod, or any other hard-disk portable player, but this will likely change over time.

Furthermore, as networks improve, music phones may complement (or replace) the personal computer as a *sourcing* device for digital music, capturing traffic as well as music sales revenue that up until now by-passed the mobile carrier networks. Most services today are offered by the carriers, however, in November 2005, Napster extended its download and subscription service to Windows-based Smartphones, distributed by AT&T. The service, which enables "straight-to-phone downloads" competes with AT&T's music offering, but the carrier still enjoys revenues from network traffic.²⁸

It is unclear how popular mobile sourcing services will be, compared to Internet downloads. While the mobile channel is valuable for capturing impulse buys (combined with song-recognition technologies, for example) and as a marketing channel (through ring tones and potentially satellite radio²⁹), some mobile operators have experimented with services that combine a PC-based download option for a multi-channel user experience, recognizing that the personal computer is the more likely device for selecting the bulk of music because of the limitations of the phone interface for these processes. In other words, while digital users may want to store and listen to music on their cell phone, they may not acquire the majority of their music over the air via mobile devices.

On the one hand, the increased use of phones with integrated playback features could encourage the practice of mobile sourcing. On the other hand, particularly in North America, where Internet culture still revolves primarily around the personal computer and a fixed connection, side-loading models – where music is first downloaded to a personal computer and then transferred to a music phone – may reinforce dependence on the computer for sourcing music, while music phones become better substitutes for portable players. In other words, users may shift to a converged portable device, but they may remain happy with the current model of transferring music from their computers to that device, provided the end-to-end experience is not significantly compromised.

In this latter scenario, mobile services will remain a niche market, although both options (side-loading and direct download to phone) will be available to music phone users, with mobile service providers charging a premium for the convenience of anytime/anywhere purchasing and direct downloading to the phone.

In more advanced wireless cultures like Japan, the situation is quite different. According to the RIAJ (Recording Industry Association of Japan), mobile services account for 97% of digital music sales, compared to Internet-based music stores.³⁰ Interestingly, Apple's launch of the iTunes Music Store in Japan in August 2005 more than doubled the sales of downloads in that quarter compared to the previous quarter and is expected to continue to drive PC-based downloads.³¹ In general, adoption of mobile music is relatively slow in the United States. According to a 2005 study by market research group TNS, only 4% of cell phone users in the United States listen to digital music on their cell phones compared to the global average of 19%.³²

In any case, mobile sourcing increases the value of the playback feature and will spur further innovation in the convergence of portable music players and mobile phones. One analyst notes that camera phones and ring tones have succeeded because functionality was integrated into the communication channel, i.e., the carrier's network. MP3 functions, on the other hand, have been less popular because they do not interact with the carrier's network: music phones alone offer "no more than if you had simply taped an iPod to the side of your phone."³³

DRM remains a key challenge in mobile music. Without a secure and interoperable DRM solution, the full potential of mobile media and entertainment delivery cannot be realized. In today's world, each mobile offering is its own integrated service, incompatible with any other service. As a first mover, this may have worked for Apple in the digital audio player market (at least during its nascent stages) but with an established user base of multiple mobile services and cell phones, proprietary solutions do not stand a chance. A standard DRM has not yet been accepted by the mobile operators.

How will Apple respond?

There is a lot of speculation as to how Apple will respond to these various trends. While many anticipated Apple's first move would be the creation of the "iPhone," it instead licensed iTunes and FairPlay DRM to handset manufacturer Motorola. However, without the ability to buy music over their networks, carriers were initially unwilling to distribute the iTunes phone. The ROKR was eventually released in September 2005, followed by an iTunes version of the RAZR, scheduled for release in December 2005. Cingular is the exclusive carrier of the iTunes phone in the U.S., and O2 carries the phone in the UK. Users can transfer files from their Mac or PC, similar to transferring music to an iPod. Cingular does not subsidize the cost of the handset.

Some reports claim that users will eventually be able to download iTunes directly over Cingular's network at a higher price of approximately \$2-\$3 per track,³⁴ similar to Napster's mobile version described above. A mobile iTMS would likewise compete with the carriers' existing or potential offerings, but O2 in particular stated that, like AT&T, they will still benefit from network charges, and also that they are able to provide complementary offerings that Apple currently does not including ring tones, ticketing, and community features.³⁵

The first round of iTunes phones are not considered a threat to the iPod. The iPod user interface does not translate well on a phone, and Apple's DRM technology limits the amount of tracks a user can transfer onto the phone to 100 – a far cry from the thousands of songs that can be stored on the iPod. Analysts claim this restriction is not technological, but rather a strategic decision on Apple's part to prevent the iTunes phone from competing with the iPod cash cow. An upgraded ROKR will reportedly carry up to 1,000 songs, as well as a streaming service offered by Cingular. With the ability to store 1,000 songs, the ROKR and RAZR phones are closer substitutes to the smaller iPods Nano – if these upgrades include iTunes software. At the time of writing this paper, it was not yet confirmed whether the new ROKR would be iTunes-enabled.³⁶

There is some speculation that Apple expected the iTunes-enabled phones to fail, thereby positioning the inevitable iPhone -- based on WiFi rather than cellular connectivity – as the winner. In other words, rather than bringing the iPod into the mobile value chain, a more desirable strategy is to bring wireless connectivity to the iPhone, but using WiFi instead of the mobile phone network. It is technologically easier to incorporate WiFi than cellular connectivity, the iPod storage and user interface is not compromised, and Apple does not need to worry about sharing revenue with carriers.³⁷

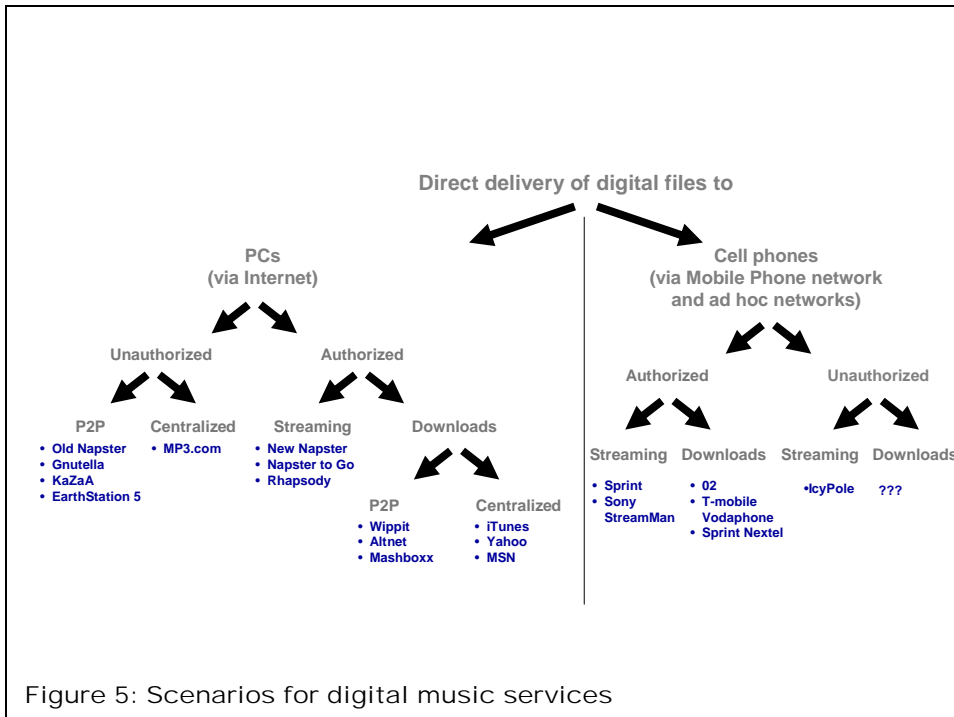
A more speculative option in the area of mobile services is Apple's transformation into an MVNO, primarily to avoid the problems it faces with carriers. It would also give it ownership of an additional control point – connectivity – strengthening its hold on the digital music eco-system and adding a new revenue stream. Rumor has it that Apple has already started working on becoming an MVNO.³⁸ Other vertical integration strategies include Apple becoming a record company, in which case it would more closely resemble Sony's business model. In effect, Apple has already begun its march upstream with the iTunes Music Store playing a promotional role once reserved for MTV and VH1. Being featured on the iTunes site has led to success for several smaller independent bands – without the need for MTV.³⁹ (Meanwhile, MTV plans to compete with iTunes, announcing in December 2005 the launch of its online music service, URGE, which will be supported by, and promoted within Windows WMP.⁴⁰)

Other options for responding to the threat to iPod's dominance include switching to a software-based strategy and licensing iTunes and FairPlay DRM to other device manufacturers, or licensing iTunes to other music stores, similar to Samsung's proposed business model described above, but either of these scenarios is unlikely.⁴¹

It is certainly in the interest of the labels for the iPod and the iTunes Music Store to lose its hold on the market in general, for the simple reason that Apple alone cannot support mass adoption of digital music. An analyst with Piper Jaffray notes that “there's just too few iPods out there to move the needle for the overall music industry.”⁴² Only 11% of Americans own an MP3 player⁴³ and even if most of those are iPods, each iPod owner only bought an average of fewer than 30 songs from iTunes in 2004, down to 16 in early 2005, and closer to 12 in the third quarter,⁴⁴ despite a huge increase in the installed base of iPods between 2004-2005.⁴⁵

The future of digital music distribution

The long-term success of digital music services has yet to be determined, and more specifically, which models will dominate. Figure 5 outlines possible scenarios revolving around several key tensions including Internet download models vs mobile services, authorized vs unauthorized services, streaming vs downloading, and centralized vs decentralized architectures.



<p>Technology</p> <ul style="list-style-type: none"> • P2P networks enable unauthorized file-sharing • Portable digital players extend the digital user experience • DRM enables authorized services • Portable DRM enables "to-go" subscription models • Cell phones integrate music functionality • Portable devices integrate more media functionality • Mobile phone networks enable mobile procurement <p>Business</p> <ul style="list-style-type: none"> • Free music competes with authorized services • Subscription models compete with pay per track • Singles compete with albums • Labels sign with digital services (or not) • DRM is used to tie music to software and/or hardware • Mobile carriers support or reject music phones • Mobile carriers create their own digital music services or partner with existing service providers • Lack of open DRM standards stifles growth of mobile market 	<p>Regulation</p> <ul style="list-style-type: none"> • Copyright law • Legality of P2P networks • Economic (anti-trust) <p>Social behaviors</p> <p><i>Users</i></p> <ul style="list-style-type: none"> • Create unauthorized P2P networks (start stealing) • Hack/circumvent DRM (keep on stealing) • Respond to legal action (stop stealing or get better at it) • Respond to legal alternatives (start buying) • Demand portable players • Demand music phones • Demand mobile procurement • Rent vs own • Share playlists rather than music files – rise of personal radio • Cultures/markets segment along architectural lines <p><i>Artists</i></p> <ul style="list-style-type: none"> • Choose free P2P vs legal online stores • Choose alternative license/compensation systems
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Figure 6: Digital music service triggers

The various trajectories are influenced by triggers related to technology, business, regulation and social (behavioral) factors, as discussed throughout this paper. These triggers cause changes in business models on the micro level and changes in the industry value chain on the macro level. The key triggers for digital music services are summarized in Figure 6.

For the time being, it is clear that within the legal download market, the iTunes Music Service dominates, with 80% market share reported in 2005.⁴⁶ In June 2005, a controversial survey by market research firm NPD group determined that iTunes is now more popular than P2P services,⁴⁷ however, critics of the survey claim the data is misleading, primarily because the P2P services that were compared with iTunes are no longer the most popular file-sharing sites.⁴⁸ The contrary view maintains that downloading activity on illegal P2P networks still dwarfs that of legal services,⁴⁹ and, as mentioned above, it is likely that file sharing will continue, in one form or another. While much of this will comprise illegal activity, there is third trajectory for innovation (besides legal and illegal downloading), which is pushing for alternative licensing and compensation systems -- a new legal environment suited to digital distribution -- that could leverage the deeply established and growing practice of file sharing rather than stifle it. Given that digital music distribution arguably makes a greater selection of music available than the traditional star system, distributed methods for music promotion and discovery will be needed, which is one thing social networks are good for. A distributed, grass roots music industry opens up a whole new world of potential business models, but this scenario is further down the road and outside the scope of this paper.

It is also possible that the legality of localized networks – or what the authors of the darknet paper call “small world networks” -- will be defined such that authorized file-sharing between small, defined groups of users (presumably at a scale that remains within the bounds of fair use) could be supported by technologies and services. Icy Pole for example, is an experimental Bluetooth application that alerts nearby users of music that matches their preferences and allows for wireless streaming between devices.

Nonetheless, legal downloads still represent a very small fraction of the overall music market at approximately 5-6%. But growth rates have been high and estimates for sales by 2009 range from 12% to 25%.⁵⁰ A recent survey however shows that growth rates are falling, from 192% from Q1 2004-Q1 2005 down to 129% from Q3 2004-Q3 2005.⁵¹

More positive statistics include a 22% increase between May 2004 and May 2005 in listening to music on a computer, and a 127% increase in the transfer of music to MP3 players, as well as a 93% increase in paid music downloads.⁵² Some reports show, however, that consumers spend less in the digital realm since downloading enables “cherry picking,” which brings in less revenue per customer than albums.⁵³

Summary and conclusion

Digital music services started out with an open value chain comprised of interchangeable file sharing networks, personal computers, jukebox software, portable MP3 players, and content. These components were loosely coupled -- interchangeable -- and DRM-free music files were not tied to specific components. A user, for example, could download music from several networks like KaZaA or WinMX onto their computer, play the music on one of several players like WinAmp, Windows Media Player, iTunes or Real, and transfer the music onto any MP3 player like an iPod or Nomad.

The digital music case study shows that as authorized services began distributing DRM-protected content online, proprietary DRM technology has been used as a key strategic mechanism for tying content to different components, thereby introducing pockets of scarcity in the value chain.

The more recent emergence of mobile carrier services has not only increased the instances of scarcity in the value chain, it also represents a shift in certain aspects of control back to traditional “core” components of the value chain and the network operators. As noted in the white paper, “Value Chain Dynamics and the Communication Industry,” digital music services originated at the edge, with no pre-existing core-based services. But the potential movement of control back to the core is greatly limited by failure to establish open standards for the mobile industry, as each service remains tightly integrated with little to no interoperability. This same lack of interoperability in the iTunes Music Store model could eventually hurt Apple as the digital music industry evolves.

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Notes

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