

Chapter 19: Digital Products Online

"At the end of the day, any system can be hacked. ... The issue is less an issue of security procedures and more a question of business models. The end goal is not to have something so secure that hackers can't break through it. You want just enough to keep honest people honest."

Vincent Pluinage, CEO, Preview Systems, and online security service provider, quoted in "Napster Wildfire", by Evan Halperin, John Borland, and Mike Yamamoto, <http://news.cnet.com/news/0-1005-201-1757865-0.html>.

Prologue

"Napster has done for piracy what America Online did for the Internet: put its technology within reach of the masses." That is how Halperin et al began their May 2000 report on Napster as the tip of the iceberg of grassroots piracy of digital content. Yet a few months later, Napster is on the ropes, and the music industry has won legal victory after legal victory. Meanwhile, online upstarts with real business models have struggled to get going. Part of the problem has been the attractions of a large, easy-to-use free service. A second issue has been the distraction for the copyright holders, as they focused on defending their core businesses, rather than on how they could extend them to the Internet. Finally, the technological infrastructure that must complement legal protections is still developing.

Even with Napster reined in, and a shadow of its original self, other file sharing programs and services will flourish. Yet they will be on notice that they are skirting or breaking copyright laws, and none of them is likely to become as prominent or visible as Napster. From now on, copyright holders will build their business models, finding the right combination of security and pricing that will "keep honest people honest."

While the possibilities for copying and distribution of copyrighted content on the Internet far outstrip anything that was feasible before, the costs of delivery also are drastically reduced. The core of the Internet is interactive access to digital information, and digital information, whether music or videos, news or entertainment, games or other software, will always play a central role online. Read on to see how the different markets for digital products and services are shaping up.

19.1 Introduction

From the perspective of cost, the Internet is wonderfully suited to the delivery of any information product, anything that can be transmitted as digital information. Music, movies, books, and software are all essentially digital products that the Internet frees from their physical straitjackets. Sellers can transmit weightless bits instead of costly atoms. This saving in real resources represents significant potential value creation. The problem is one of value capture. If providers of digital products cannot control its distribution, then they may not be able to recover their costs. Aside from issues of legality, the economics of providing digital products without some kinds of protection are not sustainable. A combination of technological responses, legal defenses and new business models for charging for digital products is likely to define the online economics of delivering digital products and services.

In this chapter we briefly survey developments in some of the different online markets for digital products and services. We begin in Section 19.2 with music, which has captured the most attention by far. We review the experience of Napster, and the alternative music sharing services that have been available. We chronicle some of the legal battles that the music companies have fought to prevent copyright infringements on the Web. In Section 19.3, we examine similar issues and developments for movies and videos. Section 19.4 looks at e-books, and Section 19.5 examines computer games and online gaming. In Section 19.6, we look at online news, and software in Section 19.7. While each market has its own special characteristics, maintaining sufficient control of illegal copying and distribution are key issues in each case. Provided this can be done, the low cost of delivering legal versions of digital products, and the greater difficulties of monopolizing channels of distribution should bring down costs to consumers compared to traditional approaches, even if free distribution is not sustainable.

19.2 Music

Online music has perhaps captured more media attention than any other aspect of e-commerce. Napster and its cohorts made access to music online so easy that downloads of digital music files soared, eating up bandwidth on college campuses and provoking an aggressive response from the traditional music industry, concerned about protecting its intellectual property and its revenue sources. While Napster still struggles in court, rivals have succumbed in various ways. MP3.com lost a court case and had to pay millions of dollars to the music companies. Firms such as Scour went out of business (its assets were acquired by Listen.com). How can we understand these developments in terms of the economics of music selling, and what is the future likely to be?

The Napster Saga We begin with a discussion of Napster, which quickly racked up a user base of tens of millions, and almost as quickly drew the legal wrath of the recording industry. The TechEncyclopedia (www.techweb.com) gives a succinct description of what the company does:

A music indexing service ... that includes an MP3 player (software), chat capability and MP3 file sharing. The application works in conjunction with Napster's Web site, which provides an index to MP3 music files residing on

other computers currently logged onto the Internet. The digital music itself is not located on Napster servers, only the directory service.

Napster does not charge for this service, a fact which clearly helped to fuel its popularity. One legally purchased copy of a song can be translated to MP3 format, and made available to millions of Napster users for no charge. In fact, rock band Metallica made headlines by documenting exactly how many Napster users had downloaded copies of the band's songs, copies that the band had not been paid for.

In that case, Napster promised to cut off the downloaders of Metallica's music, but Metallica sued Napster in April 2000. Napster's bigger threat, however, came from the Recording Industry Association of America (RIAA), which filed its own copyright-infringement suit at about the same time. The RIAA's heavyweights were the 'Big Five' record labels--Sony Music, EMI Recorded Music (subsequently merged with Time Warner), Bertelsmann's BMG Entertainment, AOL Time Warner's Warner Music and Seagram's Universal Music Group. While musicians were clearly unhappy about Napster's enabling of free distribution of their music, the 'Big Five' clearly had their own profits, through their control of distribution, at stake (see Illustration Box).

Illustration Box **Price-Fixing in Music Sales?**

The Federal Trade Commission (FTC) investigated the major record labels and some music retailers for price fixing of CDs, reaching an agreement with them in May 2000. The record companies settled with the FTC, and agreed to drop their minimum pricing agreements with retailers for at least seven years, though they admitted no wrongdoing. In August of the same year, a coalition of 28 states filed a suit against the record companies, alleging violation of state and federal antitrust laws that potentially cost consumers hundreds of millions of dollars.

Source: Various news reports

Napster's defense against the RIAA suit had several components. These were:

- Earlier court cases from the 1980s (Sony Corp. vs. Universal City Studios, involving the Betamax video recorder) and the 1990s (RIAA vs. Diamond Multimedia Systems, involving the MP3 player) had defended the rights of consumers to make personal copies, and waived copyright liability for companies that made those copying devices.
- Congress, through its passage of the Audio Home Recording Act in 1992, and the courts, in subsequent interpretations of the Act, had explicitly allowed unlimited copying for noncommercial use, so that Napster users were not violating copyright laws.

- As an intermediary, Napster was anyway protected by provisions of the Digital Millennium Copyright Act of 1998, which absolved ISPs, for example, of liability if users infringed copyrights. Copyrighted songs were never on Napster's servers, only on individual hard drives.
- Napster could be used for legal purposes, such as marketing or promoting songs from record label partners or unsigned bands, even if many people are trading copyrighted material, thus making its service "capable of substantial non-infringing use."
- The record companies had created a "copyright pool" that dominated the industry, amounting to an abuse of monopoly power (see the Illustration Box again!).

While the Napster attorneys' arguments were clever and plausible, they cut no ice with the initial trial judge, who ruled in July 2000 that Napster had violated copyrights, and must stop enabling the sharing of copyrighted music over the Internet. The judge ruled that computers and hard drives are not audio home recording devices, and that Napster is an "Internet technology" rather than a device. She found that the potential for noninfringing uses of Napster was minimal. Essentially, while file swapping on Napster was 'noncommercial', it was the scale of the Internet that seems to have swayed the judge. Despite evidence that the market for music CDs kept growing, and that many Napster users sampled music and later bought CDs, there was counter evidence that Napster was reducing sales of music CDs, especially in locations near college campuses!

Napster got a six-month reprieve when the appeals court allowed it to keep operating until the company's appeal was heard. Ultimately, though, the higher court sided with the trial judge, only requiring her to tighten up her ruling to avoid it being too broad and spilling over into other arenas. Meanwhile, one of the music giants had broken ranks. In October 2000, Bertelsmann loaned Napster \$50 million, giving it the restricted right to take a controlling interest in the company. Napster began to feature a link to CDNow, an online music seller that had been acquired by Bertelsmann. Bertelsmann's goal was to capture some of Napster's enormous user base into a fee-paying membership for a premium music subscription service. However, the other record companies adamantly opposed this strategic turn, and refused any cooperation. They have also rejected Napster's post-appeal offers of payments of a billion dollars over five years, to be split among the record companies for the use of their music. As of this writing (March 2, 2001), Napster is in the process of negotiating with the judge so that it can continue to provide file-swapping for non-copyrighted material, while it removes lists of copyrighted material from its servers.

More Battles Napster has been only the largest and most visible example of file-sharing on the Internet. Imitators such as Napigator and OpenNap, for example, allow individuals to swap music files from independent servers, using Napster's software, but bypassing its servers. Scour.net offered a Napster-like sharing service for music files, but also all other kinds of multimedia files, and was sued not only by the RIAA, but also the National Music Publishers Association (NMPA) and the Motion Picture Association of America (MPAA). Faced with this legal onslaught, Scour essentially shut down its service.

Another win for the recording industry came in September 2000, when a federal judge found that MP3.com infringed the copyrights of Seagram's Universal Music Group. Similar alleged violations against the other major labels were also settled by the company, and the ultimate cost to MP3.com ran into hundreds of millions of dollars of damages paid to the music companies. The legal action came about because MP3.com allowed its members to put MP3 versions of their music in web-based "music lockers", providing convenient access to their favorite songs. The company created My.MP3.com, a database of 80,000 songs that customers could access if they could prove they had purchased the same music on a CD. Again, this was superficially similar to previous, legally-sanctioned copying for personal use, but the fact that the company created the database, rather than only allowing individual users to copy their personal CDs into individual lockers. Furthermore, MP3.com did not sign licensing agreements with any of the music companies whose songs it used.

The MP3.com case was somewhat different from Napster's: the company actually stored the infringing material on its servers. Yet another variation of alleged copyright infringement involved a company called MP3Board.com, which provides hyperlinks to music-related web sites and music files available on the Internet. Again, the RIAA sued, alleging that MP3Board deliberately encouraged public access to unlicensed copies of copyrighted songs. The RIAA succeeded in temporarily shutting down the company's site. In July 2000, MP3Board backed off from its initial position (that it was offering hyperlinking no different from a search engine), introducing a technology (dubbed 'LinkBlaster'), that would allow owners of music copyrights to sign up for individual accounts, review links to music files and web sites in the MP3Board database, and remove links to infringing works. The software would substantially automate at least this aspect of the process of online copyright management.

The next target in the recording industry's battle plan must be services such as Gnutella and Freenet, which allow all sorts of digital files to be swapped over the Internet, but without relying on central servers. Thus these technologies are pure peer-to-peer approaches to file-sharing. This means that they are potentially much harder to control -- there are no centralized directories to remove, or servers to shut down. Freenet and Gnutella are not as user friendly as Napster, and perhaps not as robust, but they are likely to improve. For example, a version called Gnotella offers attractive Napster-like interfaces and some customization. However, increased popularity will temporarily put strains on the technology, which was not designed to handle huge numbers of users, and only heighten the legal resolve of the copyright holders. The RIAA recognizes that there is no single target to bring down in this case, but it could simply make an example of key developers or heavy individual users, seeking to scare off future activity. Peer-to-peer sharing will survive, then, but in fragmented, "underground" networks of users.

Online radio is a different battleground from online file sharing. Groups such as ASCAP and BMI have developed an elaborate system for tracking or estimating plays of copyrighted music on the radio, in commercial live performances, and so on. They collect the royalties and distribute them to composers or publishers. For online plays, however,

the Digital Millennium Copyright Act of 1998 also gave copyright holders a cut of the profits. Thus the RIAA is building a collective that will track online plays through webcasting services such as iCast or Spinner.com, collect royalties, and distribute them to artists and record companies. The Digital Media Association (DiMA), which represents webcasters, is not particularly pleased with the RIAA's efforts, which would need the US Copyright Office's approval to proceed. In essence, the question is how precisely will the record companies and artists be paid, and how much it will cost the webcasters. Many artists as well as the webcasters believe that the record companies are asking for too big a cut. Ultimately, it is only if the traditional record companies are substantially disintermediated that their ability to capture a substantial proportion of the value created by selling and playing music will be curtailed.

How will the providers of online music for listening or download recover their costs in royalties paid? The answer to this question will be one of the outcomes of the war over the distribution of music online. The battles so far have been only the opening skirmishes.

The War The new technologies of the Internet make low cost copying and distribution possible on a scale far beyond what was possible before. The main goal of the battles over online music has been to establish the scope of copyrights in the face of this threat. While technology will continue to pose substantial challenges, copyright holders and musicians want to make sure that they tackle these challenges from a position of strength. Ultimately, however, winning the war will require developing sustainable business models for the online distribution of music. We review the various possibilities and trends, and assess their prospects.

Napster and all the other file swapping services, while they are offered by corporate entities, are not viable long-run businesses in their current incarnations. Peer-to-peer alternatives such as Gnutella do not even have that goal. Ultimately, those engaged in online music distribution of some sort have to charge for what they offer. One initial possibility is always advertising, where the advertisers pay for customers' attention. However, this has proved to be a limited source of revenue, and in most cases will remain a supplementary component of online revenue streams. Hence we consider other options, namely, directly selling the services or products.

Subscriptions In July 2000, media research company Jupiter Communications (now Jupiter Media Metrix) released a study predicting that online music sales would reach \$5.4 billion in 2005, representing a quarter of the US music market. Online subscriptions were forecast to make up almost \$1 billion of those revenues. The recording industry's success in battling free services such as Napster improves the chances for this growth in subscriptions occurring. On the positive side, consumers appear to be willing to pay for reliability features such as file quality and virus protection.

In May 2000, for example, Sony and Universal announced plans to start a joint subscription service for online music. While individual record companies will offer such services, there appears to also be a role for independent intermediaries that would license

the music labels' catalogues and aggregate them into more attractive offerings. For example, at the same time the Jupiter study was released, online music company EMusic announced plans for a subscription service offering musicians who were signed with small, independent record companies. EMusic discussed collaboration with Napster on a subscription service, but those talks failed. A subscription version of Napster was also part of Bertelsmann's strategy in taking a stake in the file-swapping service, but has yet to go anywhere. MP3.com, which focuses on musicians who have not signed with any record company, does offer various subscription services by genre.

There are two versions of subscription services. In one, subscribers are able to download files that they can listen to offline, or when they are no longer subscribers. This version is more of a retail store model, with a bundle being offered at a flat price. It provides greater value and convenience for customers, but has the potential for reducing the customer base over time, as files are swapped, or subscribers build their music libraries and drop out. In another version, which is a purer service model, and gives the owners of content more control, the subscription allows the customer to listen to music through streaming media technologies, but the files cannot be stored. RealNetworks, which develops streaming media technology, for example, began a subscription service for music, video and other content in August 2000.

Pay-per-Unit The major record companies, including EMI, Bertelsmann's BMG, and Sony have also moved in the direction of digital downloading of their catalogues of music. This is closest to the traditional retail model, with the physical store and the physical format (CD and jewel case) being eliminated, but the pricing retaining its usual form. In some ways, therefore, it represents the easiest next step in the transition that runs from selling CDs in stores to selling them online. Digital distribution also allows further unbundling of music packages. While CD singles are available only for a small subset of music, because of the distribution costs, digital distribution potentially allows every song to be offered as a single. The Jupiter study referred to earlier estimated that revenue from digital music downloads will cross half a billion dollars by 2005.

Unbundling in online music distribution has not occurred in another direction. Pay-per-unit has not been reduced to pay-per-play. While pay-per-view movies are now relatively common on TV, the value of a single play of a song is probably too small, and the problems of pricing and billing accurately at such a fine level of granularity are too great for pay-per-play to become a significant segment. The possibilities for digital music distribution models are summarized in Table 19.1 below.

Table 19.1: Business Models for Digital Distribution of Music

Pricing	Flat	Per Unit
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Nature of Offering		
Product / Sale	Subscription Downloads	Retail Downloads
Service / Rent	Subscription Radio	Pay per Play

Disintermediation The record companies may prefer to control as much of the online music value chain as possible. In doing so, they will certainly bypass brick-and-mortar music stores. However, online intermediaries may be able to serve as aggregators of the record companies' copyrighted material. The music companies can engage in online joint ventures themselves, to achieve the same aggregation, but they themselves are intermediaries between the musicians and the ultimate customers. The music companies provide a bundle of services: distribution, marketing and IPR management. If new online music companies can offer similar bundles at better value to musicians, they can potentially replace the incumbents. Internet technology certainly reduces the economies of scale in marketing and distribution, helping entry. The main constraints that potential entrants face are achieving economies of scale and establishing reputations in IPR management.

While traditional record companies may be replaced by new intermediaries, both may be disintermediated if musicians are able to directly offer their songs on the web. To some extent, this is easier for established musicians, since new artists will not be found unless potential listeners know where to look or who to look for. In this scenario, musicians would still rely on agents as specialists for managing their finances, touring and other aspects of their careers, but these agents could become direct marketers and copyright managers for the musicians. For example, Lars Ulrich, the drummer of Metallica, is well-known enough to have launched his own online venture through his own music label, The Music Company, which also uses Time Warner as its traditional distribution channel. In a slightly different example, The Smashing Pumpkins abandoned their record company and released their "final album" on their web site in MP3 format only, skipping a CD-release. Courtney Love and Public Enemy made similar moves. Up to now, these have been protests that do not represent revenue-generating alternatives for the musicians, but they illustrate the potential for the Internet to change the balance of bargaining power between musicians and the intermediaries that have controlled public access to the their music. Companies such as Digital Broadcasting Corp, idealive and Farmclub.com are offering their services to independent artists, helping them make records and get noticed.

Gorillas The record companies are not the only 800 pound gorillas trying to capture a large chunk of the online music market. The big online players such as AOL, Amazon, and Microsoft all are working out strategies that will give them a piece of the action. Music is one important component of the bundle of digital products and services that such firms seek to provide.

For example, in September 2000, Microsoft acquired MongoMusic, an online service with advanced music-searching capabilities. Earlier, AOL purchased Nullsoft as its online music subsidiary, also adding online music tuner Spinner. More recently, AOL Time Warner is actively developing an online music subscription service. Portals such as Yahoo! and Lycos have also signed agreements with major record companies to offer music online, in the form of samples or paid downloads. Recently Amazon.com also followed suit in offering free samples of music to encourage online music purchases. While these efforts have not taken off so far, as the dust from the Napster case settles, the portals are likely to become significant delivery vehicles for online music, whether through direct deals with the record companies, or by providing links and access to specialist intermediary aggregators of music.

Technologies Underlying sustainable businesses for distributing music online will be technologies that limit who can use downloaded music files, and that can potentially track ownership and usage. These technologies, and the process they govern, are referred to as digital rights management (DRM). Essentially, DRM is a special kind of encryption scheme (see Chapter 2). The copyrighted content is encrypted in such a way that even if it is decrypted, it is not possible to distribute it in this form. A new recipient would have to decrypt it all over again. DRM technologies would typically also include capabilities of accepting payment (which would allow a recipient to decrypt the content), and keeping track of the terms of use that the payment allows.

Not everyone believes that DRM will succeed, because Internet users expect free, flexible access to content. On the other hand, the stakes for copyright holders are very high, and DRM offers the potential for a wide variety of pricing and distribution models, as summarized in Table 19.1. Proponents of DRM argue that as long as the steps involved for a consumer as a result of DRM technology are relatively simple and uncomplicated, and content providers are able to standardize their approach, they will win out. A sampling of firms engaged in DRM-related ventures is given in Table 19.2.

DRM is still in its nascent stages, and some pioneers ran into trouble. Supertracks, one of the early DRM companies, had to scale back its operations in September 2000, despite having established partnerships with the “Big Five” record companies, and a large number of online music retailers. On the other hand, DRM offers a general approach for all kinds of copyrighted digital content, not just music, so some version of it is likely to emerge as a mainstay for delivery of “e-content” in general.

Table 19.2: Digital Rights Management Firms

Firm	Offering
ContentGuard (McLean, VA)	DRM tools and services

InterTrust Technologies (Santa Clara, CA)	Peer-to-peer distributed DRM technology
Reciprocal (New York)	DRM clearinghouse
Digimarc (Tualatin, Ore.)	Watermarking to embed an imperceptible code
Alchemedia (San Francisco)	"Clever Content" platform safeguards digital content

Source: Technology Review (An MIT Enterprise), http://209.58.177.220/articles/jan01/TR10_singh.html

19.3 Movies

Movies and video content face many of the same issues as music on the Internet. Only the larger size of video files, and of movies in particular, has acted as a barrier to the same kinds of mass distribution that has occurred with music on Napster. However, the problems for the movie studios have already begun. Video compression technology came of age as far back as April 1999, with Microsoft releasing its MPEG4 software that would allow full-length feature films to be sent over the Internet with substantially reduced download times. High-quality pirated versions of new movies are available on the Internet, and a download over a high-speed T1 line can take only an hour or two.

Compression technology has been complemented by search and file-sharing programs that makes locating movies on the Internet much easier. Scour.net allowed movies to be shared as well as music, and that is why the MPAA joined in the suit against them. Scour did try to sign agreements with the movie industry, in order to become a vehicle for the distribution of authorized content, such as movie trailers or promotional videos. However, it was viewed as being too lax in its control of sharing of copyrighted material. Gnutella and Freenet also allow movies to be searched for and downloaded, but without any of Scour's commercial pretensions.

The movie studios have also attacked sites with hyperlinks to material that infringed their copyrights. Since hyperlinking is one of the fundamental tools of the World Wide Web, the studios' position has stirred controversy, and brought organizations such as the Electronic Frontier Foundation (EFF) to the defense of sites that offer the offending hyperlinks. One organization that was attacked was 2600 Enterprises, a hacker site that not only posted hyperlinks, but also the source code to a software program, DeCSS, which allows DVDs to be played on Linux, but also allows them to be copied. When the courts prohibited 2600 Enterprises from posting this source code, it simply replaced it with links to sites where it was available. The borderline between such links, and those brought up by a search through Yahoo!, Lycos or any general search engine, is fuzzy, and illustrates the difficulty of regulating content on the Internet.

As in the case of music, the movie studios are following a two-pronged strategy, fighting online piracy with legal weapons, on the one hand, and offering legitimate

access on the other. Web sites such as iFilm.com, and many like it offer short film clips for viewing. However, these are experimental or independent films, and a far remove from the full-length features we see in the theater or rent on video or DVD. Sites such as Comedy Central offer downloads of South Park episodes for \$4.95, or \$2.50 for a two-day rental, with online credit card payments. SightSound.com offers some full length movies for download, as well as TV programs, documentaries and other videos, all for the about the same prices -- \$2.50 to \$3 for rentals and \$5 for purchase. Whether these price points will generate high enough volumes to make these viable businesses remains to be seen. Movie studios such as Sony are just beginning to experiment with downloading of feature films online. Meanwhile, many of the online startups operate as movie fan portals, offering reviews, information, clips, chat and so on, supported by online advertising.

Eventually, as DRM technology takes hold and broadband connections become more widespread, the superior economics of direct downloading of movies will probably create a sizable distribution channel. On the other hand, video stores will remain an alternative for many, since they offer a familiar shopping method with a well-developed infrastructure, now adapting rapidly to DVDs in addition to tapes. It is useful to recall that the movie studios were initially opposed to the video recorder and the video rental and sales industry. In the end, though, it became a significant source of additional revenue, with the traditional movie theaters adapting their economics to account for that channel.

19.4 Books

The book publishing industry is also adapting to the fact that its underlying product is actually digital. The written word is much older than recorded music or video, and the printing press was probably one of the most significant inventions in human history, making large scale distribution of content possible for the very first time. In that sense, therefore, the move to electronic books marks a shift in patterns that are most deeply ingrained in our culture and society.

Traditional publishers such as Time Warner (now merge with AOL), Simon & Schuster (owned by Person), and Random House (part of media giant Bertelsmann) have created units to publish electronic books. Alternative methods of distribution are being explored. A hybrid method (being pushed by start-up Sprout, Inc. in partnership with Borders bookstores) will involve digital versions being printed out on demand at bookstores, while the long run winner is likely to be portable e-book readers that can hold numerous titles and display them on screens that emulate the look of paper as much as possible. E-books can also be read on PCs with the appropriate software, but lose their portability in that case.

Companies such as Microsoft are developing the software and hardware that will make e-books visually appealing as well as practical. Microsoft has, in fact, partnered with Barnesandnoble.com to create an Internet site for selling digital books. Amazon.com, not far behind its smaller online bookselling rival, has also chosen

Microsoft's Reader software for its offering of e-books. Adobe and Gemstar-TV Guide offer competing products for e-books, so it is not clear if compatibility issues will create problems, or whether a single format will eventually dominate. E-book sales, according to an Andersen Consulting report, may make up 10 percent of the \$23 billion consumer book market by 2005.

While e-books offer an alternative distribution channel for publishers, disintermediation is again a possibility in this industry. In Chapter 9, we described Stephen King's offering of chapters of his book *The Plant* for download for a dollar apiece, in the context of discussing microproducts. Such an exercise also represents bypassing the publisher. In King's case, Amazon.com acted as the payment intermediary. For now, it is unlikely to represent a major trend. New books will probably continue to rely heavily on publishers' abilities to promote and market them effectively. In fact, King had earlier collaborated with Simon & Schuster in releasing a short novel, *Riding the Bullet*, in encrypted form online. Half a million copies were purchased and downloaded on to handheld devices.

While novels may simply be transferred from the traditional medium of paper and ink to electronic formats, textbooks offer greater possibilities for innovation. Digitization of textbooks allows customization of content, disaggregation and re-aggregation of materials, hyperlinks to additional information and updates on the World Wide Web (as is now standard for CD-ROM encyclopedias), and possibilities for further customization and interactivity with respect to an entire course (homeworks, tests, notes, lectures, and so on). E-books can also be combined with speech technology to read out books to disabled students, or they can be more cost-effectively presented in large-font formats for those that need that option. Companies such online start-up WizeUp are moving ahead with digital versions of textbooks that are already in print versions, while the large textbook publishers are rapidly developing their own direct entry into digital textbooks.

Also in the academic world, scientific journals are quickly moving to offer electronic versions as well. Typically university library subscriptions are being negotiated to include access to electronic versions by employees, greatly expanding the convenience of access to published scientific by researchers. In such cases, while the market sizes are tiny compared to those for Stephen King novels or Principles of Economics textbooks, copyright laws still apply. The journal publishers are presumably able to improve the tradeoff between value and volume, as illustrated in Figure 17.3, in our discussion of managing copyrights.

19.5 Games

Whereas music, movies and books are making more or less difficult transitions from traditional technologies and packages to digital formats, computer games are a branch of entertainment that has risen to prominence purely on the back of the digital revolution. Games were first sold and distributed purely in packaged forms, on floppies and then on CD-ROMs. Now they are widely available for Internet downloads.

Young males make up by far the largest segment of computer games players, and piracy has been a problem from the beginning. Hackers would crack copyright

protections, and distribute games illegally on the Web. File sharing, too, has been common. Nevertheless, the computer games industry has thrived. While copyright protection technology will continue to play a role, the computer games industry has built a successful online business model. Even the best programmed game does not make playing against the computer as challenging and interesting as playing against human opponents. The Internet has allowed multiple human players to interact in real time, making each gaming experience fresh and different, and extending the demand and revenue streams for the games. There are actually two models that are used.

Games such as Diablo and Starcraft (both made by Blizzard Entertainment) can be played as single player games, and can also be played free online as multiplayer games. Online play does not directly increase revenues, but by increasing the value of the game, it increases how much customers are willing to pay. Some proportion of users will still obtain illegal copies, but the overall revenue of the game company may go up. The situation in this case is very much like that in Figure 17.3, except that here the increased value in the right hand graph in that figure comes not only or even necessarily from more liberal terms, but from adding online multiplayer capabilities.

Illustration Box **Sony's Online Strategy**

Sony is expanding steadily from its strong presence in consumer electronics and movies to offer a range of entertainment and related products and services online, in addition to its computer and home electronics products. Its initiatives include an ISP, online games by subscription, sales of TV and movie merchandise, an online music download service (partnering with Listen.com), a digital photo sharing service, and wireless links between Playstation game consoles and Japan's I-Mode Internet-enabled cell phones for messaging.

Source: Various news reports

A second model involves subscriptions for games that are purely designed for multiple players online. Games such as Ultima Online, EverQuest and Asheron's Call involve elaborate online virtual worlds, where thousands can simultaneously play -- fighting, trading, or building their own online adventures. Game play as a monthly service with credit card billing also makes piracy impossible. While all games will not be suitable for this model, its scope will clearly expand over time. For example, Sony (see Illustration Box), the provider of EverQuest, also offers other online games through The Station@sony.com, including word games and versions of quiz show Jeopardy. Earlier, Sega was one of the pioneers of subscription gaming, using its video game console and a TV channel, but the video game console makers have not managed to make serious inroads in Internet gaming.

19.6 News

Before the Internet, the standard ways of delivering news were in print or via broadcasts (radio and television). Both media are more or less mass media, though falling fixed costs and technological change in general have allowed them to become more targeted and specialized. Magazines and TV news programs, for example, have aimed more finely at narrower target audiences.

The Internet has the same impact on news that it does in general. First, it allows recipients of information to pull in that information when and where they choose. To some extent, that happens with print and broadcasts as well, since we do not necessarily read an entire newspaper, or read it all at once. However, the nature of the Web means that information can be available almost immediately without prior physical delivery. Second, digitization of information allows much larger quantities of information to be available. An entire archive of news, not just that for the current day, can be available at a website. Third, presentation of information can be customized: an individual can choose to have financial news highlighted, or sports news, or whatever he or she chooses. Fourth, interaction and sharing of information are much less costly and more immediate using the Internet. Fifth, and crucially for news, updating of news can be much more frequent on the Web than is possible with print or broadcast media.

The differences above make the Internet and the Web relatively very attractive for delivering news. In particular, financial news, for which timely availability of good information can be quite valuable, has proliferated on the Web in remarkable quantities and at a remarkable rate. The problem with news delivery on the Web has been the familiar one of charging at the margin for information products when their marginal cost of delivery is negligible. Competition makes it difficult to sustain prices above marginal cost. News providers on the Internet have therefore mostly chosen advertiser-supported business models. This is true for traditional media companies moving online, such as the *New York Times*, as well as pure-play online news providers such as CNET. In some cases, so-called “premium” content may be offered to print subscribers, as is the case with *Business Week*, so that a subscription provides access to a bundle of print and web-based content.

There are two alternative models which have been tried more sparingly, and with limited success. The *Wall Street Journal* has successfully offered an online subscription that is not linked to the print subscription. Thus potential subscribers can choose to pay for the online version, the print version, or a (discounted) bundle of both print and online versions. However, few other online news services have been able to successfully charge for subscriptions. Again, part of the problem is the low cost of delivery and ease of entry, so that even non-specialists, such as Yahoo!, are able to provide access to all kinds of news as part of their bundle of information services.

Another alternative has involved charging for news content as a microproduct. Thus, for example, *The Economist* offers access to material from its archives on a pay-per-article basis. Analytical articles, survey pieces, and other research materials are particularly suited to this model, but that also means that the market for such information on a pay-per-download basis may be limited. *The Economist* still offers this ability to purchase individual articles (at \$2.95 each), but it also offers a subscription to the online

version, as well as free online access as part of the print subscription. It is likely that the subscription model is the main source of revenue from online users, but purchases of individual articles represent additional revenue at essentially zero marginal cost. To the extent that such articles are not substitutable by free content available elsewhere through the Internet, users will be willing to pay for access.

Figure 19.1: Text and Video News Together



In fact, *The Economist Intelligence Unit* offers “premium” research content through Northern Light, a database of such content, available mostly for \$1 to \$4 per short article. Again, this is not mass market news, but crosses over into the category of research and analysis. Entry into this market requires more than access to news wire services and reportage, so providers are able to charge above marginal cost.

Finally, note that text-based news is different from video and audio news in terms of how the information is conveyed. The Internet provides an example of convergence here: while print, radio and television have been historically different media (though with increasingly common ownership), the Internet permits all three forms of news to be accessed from a single website. This convergence is a pure consequence of digital technology, as distinct from economic motives such as economies of scope. Figure 19.1 illustrates a web page from CNET, simultaneously offering access to text and video news.

19.7 Software

While any digital file is “software”, we use this category to refer to sets of such files that include executable instructions, and hence govern some process that is accomplished digitally. Thus, computer games, which we have already discussed, are a quintessential example of software. The range of software and the tasks it can accomplish are enormous: document preparation, preparing and running presentations, performing spreadsheet calculations, managing activities and time, designing web pages, communicating electronically, enabling listening to music or viewing videos, and so on. All of these examples are what are called “applications” software, since they directly allow the user to accomplish some task. Below the level of applications are many other kinds of software that govern the basic functioning of the computer itself, and its communications with other devices. These categories include operating systems, utilities, and networking software.

Many of the examples given are activities engaged in by individuals, and in such cases the software is a consumer product. Computer games, in particular, are pure consumer products. However, all the other examples given are applications that are also used in business contexts. Some kinds of software may be used only by businesses. Typically this software will govern some business process such as procurement, customer relationship management, or online ordering and payment. The Internet is not particularly well-suited for delivery and deployment of complex business-process software. Often there is still a large degree of manual effort required in the installation and maintenance of such software. However, the more standardized and stand-alone the software is, the greater the relative benefit of distributing online. In fact, an enormous amount of business software is now distributed and installed over the Internet and over corporate intranets.

Selling consumer software online also provides large savings in costs of distribution. The main barrier to this approach has been, and will be, the lack of high speed connections to homes. In addition, the solidity and other advantages of CD-ROMs and printed manuals mean that downloaded software is a slightly different product than the package bought in a brick-and-mortar store or online. The consumer saves on the costs of going to a store by purchasing online. Purchasing with a download provides immediacy and savings of distribution costs that will partly or wholly be passed on to the consumer. However, the consumer has to print out the manual and make back-up copies if he or she wishes. Thus there is a trade-off of characteristics involved. This trade-off ensures that even software will continue to be sold in packaged form, online as well as through physical stores. Nevertheless, as broadband access increases, and prominent online retailers such as Amazon.com (see Figure 19.2) start offering software for download, this will become a significant distribution channel.

Figure 19.2: Software for Download at Amazon.com



A radical alternative to all three methods of accessing software -- buying (a perpetual license to use) packaged software in a physical store, buying it online, and downloading it directly in digital form -- is renting the software for use over the Internet. This is the ASP model that we have discussed earlier. Payment schemes can be in the form of subscriptions, pay-per-use, or some combination of both. From the point of view of software developers and sellers, this model allows them to avoid the durable goods problem (Chapter 14), and do a better job of capturing the value created by the software for its users. This may be very significant since the cost of producing software is largely a fixed cost. The subscription approach is supposed to enable software users to avoid large upfront costs of licensing, and this may be important for complex business software, but it seems unlikely to matter for consumer software. Other possible benefits of the ASP model, such as avoidance of installation costs and ability to access the software from anywhere, are also more significant for business applications.

19.8 Conclusion

Digital products and services are more natural candidates for online commerce. In particular, whenever the digital product can be stripped from its traditional physical casing and provided in pure digital form over the Internet, the potential cost savings are quite substantial, and they alone make the rapid growth of selling digital products and

services online very likely. In cases where the digital product is enjoyed repeatedly, the ease of copying and sharing anything digital creates potential problems for the providers of the product, or the owners of the copyrights that protect the intellectual property. Thus technological and legal weapons are a necessary part of doing business online for digital products.

While IPRs for digital products and technological constraints on copying are important, they do not completely prevent the pressure on prices of digital products. The marginal cost of providing them is close to zero, and this is often reflected in pricing, where entry is easy enough. Only when a digital product has no close substitutes will it be possible to charge at the margin. Thus basic news is a free good on the Internet, with providers using advertising models to generate revenue, or offering it at no marginal cost to print subscribers. On the other hand, analysis, filtered data and research, in particular if it has a short-run financial value, is likely to be charged for, either through subscriptions or pay-per-unit models.

Ultimately, the Internet increases the effective supply of digital products and services, by reducing the costs of delivery. Where previously the encapsulation of digital products in physical forms (books, CDs) allowed the producers and sellers to capture a substantial share of the value created, the freeing of digital products from these physical media places greater emphasis on technological barriers to the “leakage” of this value through copying and sharing, legal barriers through the vigorous enforcement of IPRs, and the creation of new bundles that generate value, such as online music subscription services.

Summary

- The owners of music copyrights have established their legal claim that mass sharing of copyrighted music on the Internet infringes on their copyrights. Having won this victory, they will use emerging Digital Rights Management technologies to develop subscription and pay-per-use schemes for online access to music.
- The online distribution of movies and videos will closely follow the development of online music sales, as the markets are quite similar, with movies involving somewhat more complex technologies and larger digital files (requiring greater bandwidth).
- Books are also moving to electronic forms, and e-books will form a sizable market, especially for segments such as textbooks, where the advantages of linking directly to additional information on the Web, and the ability to update material rapidly are very valuable.
- Computer games are very well-suited for online access, providing opportunities for greater variety and for multiplayer gaming. They represent a booming, if specific, segment of e-commerce.
- News is also well-suited to online provision, since aggregation, customization, rapid updating and technological convergence all make online news more valuable than alternatives. Charging directly for basic news is difficult because of easy entry and

competition, but “premium” news that includes analysis is being provided through subscriptions and pay-per-unit models,

- An enormous amount of software exists for accomplishing a great variety of tasks, and much of it can now be obtained online through direct downloads, or through more radical subscription or pay-per-use models, both for consumers and for businesses.

Questions

1. How do selling music, news and software online differ? In what ways are they similar?
2. What do you think is the role and importance of interaction, either among buyers, or between buyers and sellers, in selling digital products online?
3. Which digital products are primarily or wholly consumer products? Which are primarily or wholly business products? Which are interchangeable?