SWORDS INTO PLOWSHARES:
A CONVERGENCE OF INTERESTS IN P2P

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1. INTRODUCTION

Famous for use in file-sharing communities, peer-to-peer (P2P) technology allows users of networked computers to copy contents from one hard drive to another without routing file bits or metadata through central servers. Although some 90 percent of the content now traded on such networks now appears to be works previously "ripped" from copyrighted CDs or other similar medium, it is improper to associate unreservedly either the underlying technology or file-sharing per se with illegal activity. Indeed, Dean Garfield of the Motion Picture Association of America – certainly not a copyright minimalist -- aptly made the point; "the challenge with p2p is not the technology, but the business model of those who have chosen to use the concepts … for their own illicit purposes."[1]

As a matter of course, P2P technology can indeed be used to distribute protected works in a legal fashion. If protected by digital rights management (DRM), copyrighted files can be traded for a unit fee, made available to paying subscribers, affixed with commercial advertising, or otherwise transacted. Depending on the preferences of the content owner, protection of a particular work can be restricted to a number of particular uses or devices, or made available for unlimited use and free distribution). The titles and/or content of uploaded tracks can be playlisted, blogged, e-mailed, and serially and virally distributed in anticipation of reaching a wider base of potential buyers. In wider applications, file-sharing networks may facilitate the creation and exchange of customer-generated multimedia works that can increase audience interest, build new user communities, and widen audience interaction and choice.

Peer to peer technology is seen in this article as a technology that can potentially bring content owners, transport providers, and advertisers to a convergence of commercial interest regarding content, advertising and transport. Unlike the great technological convergence of the computer and the telephone of the last ten years, the envisioned convergence is not based not on the blending capabilities of digitization per se. Rather, emerging modes of technology and content will enable content owners to think of common interests to present vast amounts of material online at reduced distribution cost and with heightened viewer awareness. .

From a street corner on New York's Madison Avenue (i.e., advertising), the Internet now represents an evolving platform for new forms of advertising that will continue to transform retailing and marketing. In pursuing the widest audience base for their sponsors, content owners may reduce – or eliminate entirely -- unit prices or subscription fees that would deter this buildout. File-sharing networks can also be used to identify,

compose, and repackage a particular user's expected taste profile based on her personal clickthrough history.

From a viewpoint in Hollywood, P2P users may form open taste-based communities oriented around personal interests rather than shared demographic characteristics. This will facilitate the development of "community products" and "media windows" that increase the platforms that are available to monetize investments in content. Discussed below, the efficiency of "data swarming" will allow producers to store large files on unused computer space near the point of final use. In so locating file bits, P2P reduces the demand for network capacity (i.e., streaming servers, data centers, local caches, and dedicated bandwidth) that would otherwise be necessary to accommodate file transport and distribution.

I shall argue that there is no compelling reason why every transaction on the Internet must be covered by a unit price or a subscription fee. Depending on the transaction costs of market exchange, content-sharing in an "information commons" – i.e., institutional spaces inconsistent to some degree with the necessary preconditions of functional markets – can be a preferable means of exchange than customary methods of bilateral trade.[2] However, the relative efficiencies of the "commons" are not ubiquitous, nor are the boundaries of commons properly limitless. Therefore, commons operators cannot be permitted to grab content without some careful attention to producer interests and incentives that may otherwise be damaged by the free takings. If the formal rules of the commons are to be effectively enforced,[3] digital rights management strategies are reasonable means of providing exclusive rights of attribution, binding metadata and advertising messages to underlying content, and ensuring that content is not traded without the appropriate pricing provisions asserted by the owner. Watermarks, fingerprints, and filters are additional prophylactic aids that make any commons more navigable for legitimate participants.[4]

2. FILE-SHARING AND NETWORKING

The process of peer-to-peer file-sharing works as follows. Users download software from a P2P provider, such as KaZaa or Bit Torrent. Once software is downloaded, the user may upload selected files from her hard drive to a public folder on her computer in order to allow other connected users the option of making copies of the work. Such uploaded works often include tracks "ripped" previously from CDs or acquired otherwise. Moreover, network users may also download files made available on other computers, so also acquired through similar "rips", downloads, or purposeful seeds.

There are four alternative topologies for content distribution on file-sharing networks. In the first generation of 1999-2002, Napster, Scour, Aimster/Madster, Audiogalaxy, and iMesh routed user requests for content through central directories that located sought files on other networked machines. In a second generation of decentralized topology, KaZaa and Grokster routed file requests through intermediate directories, called supernodes, which are other computers located nearer to the requesting computer. In yet a third

variation, BearShare, Limewire, and Morpheus distributed open source Gnutella programs that passed information requests directly from one computer to another, without the direction of supernode intermediaries. Finally, BitTorrent and eDonkey now break down large content files into chunks that can be simultaneously located on different computers in the network; a requester may use P2P software to locate components in her geographic area and recompose whole files from elemental content distributed nearer to her machine.

Business models for monetizing network operations and investments may vary. Napster, Grokster, Streamcast, KaZaa, inter alia, famously allowed unrestricted uploading and file trading among software users. These services profited by distributing advertising, collecting personal data, and selling machine capacity for distributed computing[5] In an alternative model, Altnet, Trymedia, and Intent have restricted trading to protected files, but delivered their content over capacity purchased on the larger P2P networks. Finally, Wurld Media and Mashboxx, inter alia, now operate independent stand-alone networks that filter files and limit downloads exclusively to protected content.

It is the first type of network – Napster, Grokster, Aimster, etc. – that has been the object of contested debate and repeated judicial scrutiny. While courts have finally upheld content owners in every instance, the user base for P2P has continued to grow, as seen by the attached charts of simultaneous users in the U.S. and abroad. P2P software now is estimated to span over 100 million personal computers throughout the world; the software may have enabled the exchange of nearly 100 billion music files.[6] These numbers should be contrasted with U.S. domestic bases of 11.5 million users who have purchased on pay-per-download and 3.4 million U.S. users who now pay for monthly subscriptions on streaming services.[7]

In May, 2006, Big Champagne repported that the U.S. population of simultaneous users reached 9,735,661, which was up 12.4% over May 2005.[8] The web monitor CacheLogic in 2005 identified P2P as the most common protocol on the Internet, accounting for 60 percent of all bit traffic.[9] Some 62 percent of P2P traffic is video, 27 percent is software, and 11 percent is audio.[10] However, market shares of the major players have changed considerably in the past two years. The "data swarming" technologies of eDonkey and Bit Torrent have gained share, while former leader KaZaa has lost considerable appeal.[11] EDonkey is now the market leader in terms of consumed bandwidth, while Bit Torrent particularly appeals to tech-savvy users who seek video.[12]

For ongoing technologies will make P2P networking even more appeal in the next few years. . Using software provided by Centale or Mercora, P2P users may now stream content from other connected machines without having to devote storage space for the download. Second, Trusty Files announced in the forthcoming availability of "Ultimate P2P" software, which could enable a search across all network formats – Bit Torrent, eDonkey/Overnet, Gnutella, and Kazaa/FastTrack.[13] Third, service providers such as Grouper now proide proprietary "darknets" to over 100,000 private groups that comprise only invited or paying members. 'Deep encoding on the "darknet" may thwart detection of copyrighted material.[14]

3. BROADBAND AND ADVERTISING

As a last phenomenon, the potential applications of P2P will widen yet more as the demand for broadband connection widens. With cable modem or DSL speeds ranging from 600 kB to 1.5 MB per second (as distinguished from the standard 56 kB per second now found on narrowband connections), the potential [15]of the widening network to deliver richer content and advertising increases yet more dramatically. According to Worldwide Online Access: 2004-2010, 175 million U.S. users now have access to the Internet netitnetin the U.S. adband. the U.S. leads the online pack with 175.4 million users; some 108.1 million user (or 61.6 percent) now have broadband connections. The survey projects that over 85 percent of US online households will have broadband by by 2010.[16]

From the perspective of advertisers, the buildout of broadband presents a glass that is both "half empty" and "half full", both a danger and an opportunity. The Pessimists at large would argue that the growth of broadband has "made it increasingly difficult for marketers to not only reach their target consumer, but also get their attention."[17] With boundless resolve, Optimists would respond that "the new media environment centered around the home (and work) PC is a boon for advertisers who now not only have expanded opportunities to cross-sell their products and services, but also have the opportunity to cost effectively expand the reach and frequency of their media buys."

Sooner or later, everyone in the advertising industry will at least consider converting to Optimism, and many will maintain their faith. Besides television, the Internet is the most popular medium in every daypart (Research was performed by the Center for Media Design at Ball State University, which tracked the media usage of 350 people recorded at 15 second intervals. By combining capacities for tracking, targeting, interactivity, transaction, distribution, and affiliate marketing, the Internet will continue to prove itself to be a powerful integrated mechanism for advertising and retailing. With wider use of broadband, these same capabilities will develop beyond the texts and graphics of banner ads and popups to feature-rich advertising bearing spoken words, music, fixed artwork and photographs, and moving visual images. Here, file-sharing and interest affiliation will accommodate information exchange among user communities based on actual personal tastes and interests rather than imagined demographic correspondences.

Though Internet advertising now accounts for only 8 percent of total advertising in the U.S, the total in the first quarter of 2006 exceeded the corresponding level in Q1 2005 by 38 percent.[18] Activities in the search engine sector are the harbinger of things to come.[19] The bellweather company in this regard is Google, which now draws some 98% of its annual revenues from the sale of advertising to viewers attracted by free e-mail, search, instant messaging, photos, maps, and shopping services.[20] Google's advertising revenues more than quadrupled in 2003-2005, largely due to increases in the number of paid clicks rather than its rates. Net income per basic share grew in the same period grew from $0.77 to $5.31, while diluted shares grew from $0.41 to $5.02.[21] The value of

Google equity has quadrupled since its public offer in September, 2004, at the same time that major old media players News Corp. and Comcast trailed the S&P index by 25 percent.[22] The search engine Google is now worth as much as Disney, News Corporation, and Viacom combined.[23]

Competing portal Yahoo! generates revenues from both advertising and premium services,[24] for which it charges an additional fee. Nonetheless, advertising and related marketing accounted in 2005 for 87% of the company's total revenue; the company also invested in the past year an additional $2.0 billion dollars in advertising-related properties.[25] A primary attractive instrument is Yahoo! Music (25 million viewers per month[26]), which include a network of over 200 online radio stations serving nineteen different music genres,[27] Musicmatch (a provider of music management software and a-la-carte song downloads), and a competitive monthly subscription service that provides unlimited streaming access to more than 1.5 million songs.[28] In a clear indication of the interconnection between broadband, video, and advertising, Yahoo now serves approximately 350 million video files per month as part of its audience acquisition strategy.[29] Yahoo is also developing search features for all available music services,[30] accommodates user plug-ins that will include music podcasting,[31] and announced plans to spend up to $10 million on a reality TV show.[32]

Driven historically by the sale of its monthly "dial up" subscription service, AOL in 2005 increasingly began to move away from a business model where subscriber fees outpace advertising revenues by ratio of 3/1.[33] . Declines in subscriber levels have resulted at AOL throughout 2003-2006 and are expected to continue; the company consequently expects advertising to be an increasingly important source of income in the near future.[34] The company also acquired Advertising.com in August, 2004 in order to develop revenue-sharing arrangements with interactive publishers and websites.[35] AOL continued in 2005 to develop free services – AOL.com, AIM, MapQuest, Moviefone, ICQ, and Netscape – that are available to all Internet users.[36] Finally, AOL in December, 2005 entered into a letter agreement with Google under which the two parties agreed to create an AOL Marketplace through white labeling of advertising technology, expand display advertising throughout the network, collaborate in video search and integrated services, and interconnect their respective instant messaging users.[37]

The pattern will continue. A recent survey found that advertising on search engines will increase in 2006 by an expected 26%; total online, print, and TV/Radio will notch corresponding levels of 19%, 3.3%, and 2.4%.[38] In the longer run, half of all surveyed marketers now plan to shift spending from traditional to online channels. Indeed, Forrester Research forecasts that total online spending will increase from $15 billion in 2005 to $26 billion in 2010.[39] And basic services (with no fees) will be key in the video buildout; new research confirms that consumers prefer – by a three to one margin -- free content with advertising messages to paid video at $1.99 per view. [40]

As evidenced by Yahoo!, of growing importance to the specific development of the search engine and broadband application will be the interactive video, which is a powerful instrument now beginning to attract the younger demographic anxious for a

wider selection than MTV and VH1. Indeed, demand for online interactive video surged 80 percent in 2004, with music videos accounting for the largest component (34 percent) of the total.[41] In March, 2005, David Goldberg, General Manager of Music at Yahoo!, claimed that the engine served 350 million videos per month.[38]

All this activity by search engines will compel the music services to offer more music for no charge sponsored by advertising. At present, Napster allows all users to list to any of two million songs in its catalog up to five times for free. This advertising-sponsored service complements the message boards and news materials that elsewhere populate its site, and is aimed to attract potential subscribers to the unlimited streaming and download services that Napster also provides.[42] Major label EMI now will follow suit, offering with Qtrax an advertising-based service that promotes EMI songs.[43]

4. PERSONALIZATION AND RELATIONSHIP BUILDING

Media networks will become increasingly interested in the abilities of P2P technology to combine content presentation, taste affiliation, and customer tracking. These open and elastic combinations will allow advertisers and media providers to extend and deepen relationships with viewers and buyers. To understand the growing awareness of personalization and relationship building, consider the recent acquisitions of Rupert Murdoch's News Corporation, quite possibly the most important events in news media in the year 2005.

In July, 2005, News Corporation acquired the two digital properties – Intermix Network and Alena – of the highly successful web-oriented venture Intermix Media. The online material of Intermix is oriented around social networking, casual gaming, humor, and viral entertainment – e.g., flash animation games, greeting cards, inspirational messages or humorous cartoons. Intermix also provides 35 different email newsletters related to entertainment news, animated toons, and casual games.[44] The resulting media platform is a network that now reaches over 27 million monthly viewers through content presented on 30 websites.[45]

The audience size of the Intermix system grows as members send electronic newsletters to friends with light-hearted readings, jokes, and electronic greeting cards. Intermix then sells advertising space in the newsletters to commercial sponsors, who refer people to their commercial websites. Intermix itself markets subsequently to all members through Alena, which brings new products to market by integrating proprietary technologies and marketing techniques through Intermix websites. An Intermix executive described the business strategy: "We encourage and facilitate the sharing of content with family

[38]"David Goldberg on Yahoo's Value in Music", Billboard Postplay, March 2, 2005, http://billboard.blogs.com/billboardpostplay/2005/03/david_goldberg_.html (retrieved June 22, 2006)

and friends with our simple share-a-page referral engine. In this way, we take advantage of viral marketing to bring in new users". [emphasis mine][46]

The popular website MySpace.com, which daily attracts over 250,000 new users and now counts 76 million subscribers, is now the crown of the Intermix constellation.[47] Now serving 8 percent of all ads on the Internet, Myspace.com has moved into the range of the leading portals, and is now ranked as the fifth most popular web domain in total number of individual page views.[48] Users engage one another through personal interest -- blogs, instant messages, music downloads, photos, classifieds, events, groups, chatrooms, and user forums. Moreover, over 350,000 bands and artists – including REM, Black Eyed Peas, and Weezer – have launched new albums and put new songs up for sample on the website.[49] Jupiter Research recently learned that MySpace generated more community-relaetd music activyt than YahooMusic, AOL Music, or MTV.com .[50]
Other major social networking sites includes LiveJournal, Friendster, and Facebook,.

After acquiring Intermix, News Corp. pursued more investments in order to improve appeal to advertisers. The company targeted the much sought demographic of males below the age of 35 with acquisitions in September, 2005 of the sports properties of Scout Media and the game properties of IGN.[51] With these new acquisitions, News Corp. can now expect some 70 million unique viewers and 12 billion page impressions per month.

As a new eyeball magnet, News Corp. now ranks as the fifth most visited web entity (behind Google, Yahoo, MSN, and AOL).[52] As a possible next move, the company is now rumored to be in negotiations with Blinkx.tv, a technology company that uses advanced speech recognition and video analysis to provide a search engine for videos and podcasts.[53]

At present, the material for the new digital properties in the News Corp. networks is stored on and dispatched from central servers. However, the presentation strategy of News Corp. is conceptually equivalent to the primary aims of a proprietary file-sharing network and can be readily implemented across P2P networks instead. In this respect, News Corp. should be quite appreciative of the discussed efficiencies that P2P enables.

To sum up the discussion of the last two sections, advertising and personalization are key tactics in future media plays. They will surely affect the commercialization of P2P, which may be constructively viewed as an enhanced search engine.[54] In a practitioner's toolkit, P2P providers may use their substantial scale to accommodate advertising, conduct market research, and sell merchandise and commercial upgrades. Revenue instruments for advertising include number of listing, impressions,[55] clickthroughs,[56] actions,[57] leads,[58] transactions,[59], and data resale.[60].

5. COMMUNITY AND PROMOTION

The best example of relationship building on P2P networks is the present ongoing use of network capabilities by independent bands and record labels, which now build online communities of common interest among fans. Independent artists with limited or no access to radio and retailing are particularly good candidates for business models involving file-sharing, video peercasting,[61] possibly affixed with advertising messages or superdistribution tracking (see below).

The "jam band" approach will expectedly appeal to both readers and advertisers of online alternative newsweeklies (such as the Village Voice [N.Y.], Chicago Reader, and L.A. Weekly[62]), which are very profitable and influential[63] regional or local newspapers often oriented around weekend music in the area.[64] But national breakout is also possible; as a leading showcase for independent media, the 20th Annual South by Southwest (SXSW) Music Festival and 13th Annual SXWS Film Conference and Festival seeded (in March, 2006) on P2P network BitTorrent a superfile that included tracks from many of the most popular acts at both festivals.[65]

With an eye to business synergies, musician Scooter Scudieri combines music, advertising, and file-sharing.[66] Mr. Scudieri works with marketing professionals (such as Intent Media Works, see below) that distribute his tracks and videos affixed with sponsor messages. When listeners download Scudieri's songs or videos for a fee, they also view the accompanying advertisements, which may also bear a possible click-through link to a commercial website. For every download of a track, the sponsor pays a few cents to Scudieri. With over 50 million search requests Scudieri is now the most searched independent artist on the web; his first videp. "Mother of God" was downloaded 250,000 times in the year 2005.[67]

The demonstrated potential for corporate sponsorship of new music increased as five top independent artists combined in fall, 2005 in the "New Voice of P2P" concert tour, which presented 45 live concerts in 30 east-coast markets.[68] Sponsoring companies reached local audiences and enhanced brand awareness among a youthful demographic drawn largely from colleges and universities. Produced by "Beneath the Noise" (BTN), the tour guaranteed 350 million gross impressions for its sponsors, including 80 million users of interactive ads and home-pages, and 170 million P2P downloads of tour and concert files[69]

More flexible business strategies for musicians and advertisers are available from Intent Media Works, which operates a number of integrative technology platforms that include review and purchase, pay per use, subscription, and advertisement supported.[70] After protecting works with digital rights management, Intent Media directly seeds material in file-sharing networks and ensures that their files appear near the top of Internet search engines. With Intent's standalone software myPeer, users may exchange files freely but must receive owner permission to open them. For participating advertisers, Intent also offers an e-commerce platform, Palladium, which allows advertisers to place ads on information pages, insert ads along with a song or video, or embed the ad with the content itself.

Riding piggyback on the 70 million computers that have downloaded KaZaa and Grokster software,[71] P2P provider Altnet now sells DRM-protected music for, and shares advertising revenues, with seven participating labels -- V2, Artemis, Epitaph/Anti, Side One Dummy, Palm, Simmons/Latham, and Koch Media -- which have Gold Pass rights to be presented at the top of search lists that bear any of their title phrases.[72] P2P provider Nareos may follow suit with both advertising and pay-per-use modes; the company announced in November, 2005 distribution agreements with independent label distributors CD Baby (100, artists), Ingrooves (350 labels), and Digital Rights Agency (225 labels).[73]

The vast potential for community and promotion will move in the wireless domain in the next five years. Using the Peerbox technology now available from Nareos, a wireless user may access 50 million songs now available on P2P networks. Peerbox also features voice recognition and recommendation based on download choice; it can recognized background music and find an available track for download, if legal. The final version will be available in English, Spanish, Chinese, Japanese, Korean, Portuguese, French, German, and Italian.[74]

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6. RECOMMENDATION AND HIERARCHY

A key component of media retailing is the market process of researching tastes, channeling information, and presenting product for listener consideration. Historically, much of this work was done by the marketing departments of record labels that promoted new sounds through radio, video, advertising support, and store placements. As the digital marketplace evolves, these traditional hierarchies will co-exist with more open systems of recommendation that will often include p2p.

For whatever the reason, radio stations in the past six years have lost audiences in all age groups, with the worst percentage drops among teenagers (12-17) and young adults (18-24) who are more enthusiastic about new music.[75] Moreover, while broadcast radio is a convenient medium for reaching adult audiences during rush and work hours, it is less appealing to teenage buyers who now migrate to portable music players, video games, music services, and file-sharing that displace radio time. Simultaneously, older listeners can be expected to migrate to subscription satellite radio (e.g., XM Satellite and Sirius) with all-music formats, specialized music genres, and no advertising interruptions. As the digital infrastructure develops, new services will come to weaken the position of radio yet more.

Much like interactive radio, Mercora and Centale now provide a P2P streaming service; whose audiences may search-and-play tracks without actually having to download them.[76] The radio-like technologies can be supplemented with advertising spots that sponsors may buy. Mercora now claims to provide 45% of all radio content in the U.S., with a daily average of 35,000 channels and 840,000 program hours.[77] The combination

of P2P and streaming may be a preferred situation for advertisers and content owners; customers may sample at will, but piracy is more easily deterred.

A privately held market research company, Big Champagne, is a primary example of the convergence of interest between old content and new technology. Big Champagne began measuring downloads of individual tracks on file-sharing networks in the year 2000.[78] Despite initial fears, major record labels, online services (Yahoo! and AOL) radio stations, artists, managers and other music establishment professionals have all come to use Big Champagne surveys to learn listener tastes and to suggest modifications in airplay and retail shelving;[79] Big Champagne data are now linked also to Nielsen's airplay monitor BDSRadio.com and point of sale monitors SoundScan, VideoScan and BookScan.[80] The key feature of the system is the ability to track all uses at all times.[81]

The potential for local promotion and networking is enhanced with P2P technology developed by Cornerband.com.[82] Licensed by the RIAA in 2001 and a trader of authorized musical works, Cornerband.com now uses P2P technology to accommodate searches for local talent. Cornerband users may find local bands by entering certain key words; e.g., a user who enters "Celine Dion" and "Toronto" will learn of websites, downloadable content, and possible appearances of any similar performer who may be performing in the city's metropolitan area. Cornerband is now in a partnership with NT Media, the largest alternative newsweekly group in the country, which provides websites for individual local bands. With Altnet, Cornerband has also created the Emerging Artists Channel, which allows member artists to design their own distribution rules to sell Gold Tracks over KaZaa.[83]

A more generalized approach to recommendation emerged in February, 2005, at Upto11.[84] Using proprietary mathematical algorithms, music researchers at Upto11 identified common listening tastes for users of designated songs in over 250,000 music folders now observed on various file-sharing networks. Within seconds after entering the name of a band, a prospective listener can read articles and listen to tracks from as many as fifty other bands judged to perform in a similar genre. Engaged fans can publish comments, offer playlists, and construct RSS feeds. Rather than present new tracks based on algorithmic correspondence, Last.fm allows users to report listening habits to others and to exchange playlist ideas directly.[85]

A more top-down approach to recommendation comes from the Jun Group, which now seeds music files to generate audiences for corporate sponsors.[86] Jun places material at the top levels of the file-sharing universe – i.e., the more technical users who trade files on Internet Relay Chats and Usenets who are appreciated as taste-makers for the rest of the file-sharing community. The Jun Group inked commercial deals with Yoo-Hoo Chocolate Drink, which sponsored a free five-song release by the new band, the HiWatts, as well as Hearst-Argyle, which promoted the music of superstar Stevie Winwood. The Jun Group also distributed the world's first sponsor-supported made-for-P2P program series, "The Scene".

As an example of layered recommendation, musicians and labels can deploy superdistribution systems, which allow enthusiastic fans to promote favored acts through e-mail, blogs, or websites. Weedshare pays up to 35 percent of sales revenues to listeners who recommend songs that users come to buy.[87] Following a different model, each user on the Wurld Media network gets paid 10% for recommending a sale, and up to 5% for owning a track that is later distributed.[88] After settling in 2005 its lawsuit with he recording industry. iMesh instituted a new business model centered around a menu of customer subscription fees based on perceived willingness to pay; users of iMesh5.2 can interconnect with all the P2P networks.[89]

A leading recommendation system that could potentially be integrated with P2P is Gracenote, which executed over six billion actions for music recognition (including artist, album, track, and release year) in its Global Media Database. [90]Containing over 55 million tracks, access to Gracenote's database is included in over 4,000 computer applications and is embedded in hundreds of portable, home and automotive consumer electronic devices. Gracenote's experts classify all music into 1,600 genres with additional enhanced attributes based on region, era, artist type, etc. The system may activate recommendations after a user enters a seed song, album or artist. Soon to be release, the advanced engine Discover will generate recommendations based on three different types of integrated analysis: music expert editorial, community-based preferences, and shared audio attributes derived from digital signal processing.[91]

7. NETWORK EFFICIENCY

As a second aspect of the new convergence of interest, P2P in two way advantages the producers and distributors of high-bandwidth files, such as movies, videos, and casual games. First, "data swarming" technology economizes on storage and transportation capacity. Second, file-sharing provides wider channels for windowing and price discrimination, which broadens the interval, depth, and profitability of the audience interface.

"Data swarming" works by splitting large content files into smaller elements that are distributed across host computers dispersed throughout the software network. With the accompanying software, a requesting user may reconstitute the distributed elements into a whole file for downloading or streaming to his hard drive. Data swarming improves efficiency because it uses idle storage near the user and thus avoids the need for centralized storage and longer transport pathways that may cost up to 65 cents per GB (as distinguished from 3-4 MB now needed for a popular song compressed by MP3.)[92] . These swarming networks are readily scalable and can be ramped up to sustain higher levels of processing power in a matter of seconds – quite useful for the transmission of live events (e.g., concerts, sports, award ceremonies). Finally, the distributed use of capacity also increases the resiliency of the network to failures.

Some numbers may illustrate the potential efficiencies of data swarming. A software publisher hired P2P provider Red Swoosh to deliver a 200 MB software package to

500,000 viewers. After pricing the costs of traditional technology at $150,000, Red Swoosh offered combined storage and transport service at $15,000. When the publisher later added a five minute video to the campaign, the estimated cost for traditional networks rose to $225,000. Red Swoosh still charged $15,000.[93] Similar tenfold savings on television signals have recently been reported by Zattoo, a commercial, DRM secure IPTV service developed by researchers at the University of Michigan. [94]

Perhaps the best example of the new convergence occurs in a deal involving the MPAA and BitTorrent, a technology provider that now accounts for roughly one third of all illicitly used bandwidth and a major contributor to the present fact that over 650,000 movies per day are illegally downloaded.[95] The signatories to the new deal agreed to enable the distribution of legitimate cinema works over the Internet using the company's highly efficient "data swarming" technology. For a first time engagement between a movie studio and a P2P technology, Warner Bros. Home Entertainment now uses the "data swarming" efficiencies of Bit Torrent to deliver movies on demand.[96]

8. WINDOWING OF CONTENT

A third major advantage of p2p file-sharing is enhanced windowing, which is the stepwise release of media content over a sequence of commercial venues with different prices and levels of appeal in each . For example, movies are now released sequentially to first-run theaters, budget theaters, pay-per-view television, video stores, premium cable, basic cable, and broadcast television. Through strategic windowing in digital presentation, studios may widen the appeal of the theme or embedded talent, and develop new interest groups that otherwise might not be reached.

File-sharing can be a key technology for adding more windowing to any media presentation -- paid, advertised, or entirely free. Partially owned (37.5 percent) by News Corporation, the British Broadcasting Company now permits its eight million customers to view and exchange films for one month after an over-the-air broadcast.[97] [98]Since online viewers can be tracked, the BBC network uses file-sharing technology provided by Kontiki to monitor and broaden viewer access to its material, for the evident benefit of advertiser interests that appreciate a longer shelf life for their sponsorships. The BBC also plans to open up segments of its video archive, which now includes up to 600,000 hours of programming.[99]

In the U.S., NBC and Universal appear to have followed suit; the two announced plans in November, 2005 to make movie and TV content available to file-sharing customers (of Peer Impact) for a 24 hour viewing period after purchase.[100] At AOL Time Warner, a new service, In2TV, will offer via P2P back catalog of popular Warner television shows such as "Welcome Back Kotter,â€• â€œBeetlejuice,â€• â€œLois & Clark,â€• â€œLa Femme Nikita,â€• and â€œGrowing Pains". A limited number of short ad spots will be mixed into the videos, which will be free as long as the user agrees to share them through a P2P-like service using technology from Kontiki.[101] The television service is related to a

Warner movie service service established with European provider arvato mobile, which sactually rewards movie download buyers with bonus points for upload capacity provided on their hard drives. [102] . The Warner television service is related to a Disney rerun system sponsored also by advertising that now uses direct streaming only, which may face more problems with degradation in longer programs.

In connection with world events, CBSNews.com in July, 2005, introduced The Eyebox, a video window that plays on-demand news clips from the CBS television network.[103] The Eyebox augments clips with banners and in-stream advertisements from corporate sponsors such as WalMart. While CBS News now serves an audience of 20 million viewers; the range of Eyebox can evidently be expanded and its relationships deepened further if CBS can integrate with its inhouse radio chain Infinity Broadcasting. Alternatively, users may be reasonably allowed to trade clips with additional comment and cross-reference on the news.

It is also possible to abstract program content to create simple advertisements that can be exchanged among shoppers and advisors. For example, the Scripps Network -- producers of the Food Network, Fine Living, HGTV, and DIY -- now strips and repurposes program clips from its consumer-oriented cable shows. To provide for word-of-mouth advertising, the clips are seeded and made available for online delivery in file-sharing networks. Network advertisers may maintain video showrooms, websites, and retail channels that enable immediate purchase.[104]

Direct fan engagement with media product increases viewer interest and audience size. Aided by file-sharing, a distributed base of users can originate, modify, and post material on web sites or folders. Potential applications of new content enabled and exchange by file-sharing networks could include viewer comments, suggested cross-references, fan fiction,[105] multimedia art,[106] song "mashups",[107] and edited movies.[108] This type of viewer engagement could widen and deepen the emotional resonance of the audience, which may return daily or weekly to the same venue for some indeterminable time, (e.g., the remainder of a sports season or election campaign).

In prerelease windowing, movie producers can generate enthusiasm and revenues by seeding news clips, movie previews, and gossip in file-sharing networks (compare Jun Group above). For certain releases, such as iMax presentations in science museums, seeding can be deliberately targeted at educational organizations, parents, or students. Fan bases for particular actors or movies can also be engaged or deepened if short clips of movie footage can be traded as well; e.g. director Peter Jackson distributed his diary of clips from Lord of the Rings on BitTorrent.[109] To monetize distribution of content, accompanying message space can be affixed on all materials through the technology, inter alia, of MIT-based Brightcove, which now assists producers at Viacom and A&E to load sponsored video onto servers with affixed user fees and/or advertising messages.[110]

Windowing can be recognized as a particular form of versioning – the offering of granular or personalized options to individual users -- which would allow users to upgrade to different deluxe packages, e.g., without advertising.[111] For example, a core of

free services can be offered to basic members, while a wider range may entail an additional fee (including commercial posting outside the group. However, if any form of versioning is to operate effectively, resale or arbitrage among users cannot always be permitted. If necessary, digital rights management here provides the surrounding security for producers to develop a wide menu of service and product offerings that cannot always be melded without harming producers. With DRM, we have the possibilities for market experimentation, learning by doing, flexible services, and complex product and pricing configurations involving bundling and joint venture business models.[112]

9. CASUAL GAMES AND ADVERTISING

A key instrument for convergence of advertising and entertainment is the casual video game, which can now be delivered over digital channels to one or more simultaneously connected players. Now at an annual sales level of $240 million after a market presence of only four years, casual games are expected to break $1 billion of sales revenues by the year 2008.[113] The video game presents three key considerations for discussion -- bandwidth economy, demographic appeal, and product placement.

Regarding bandwidth economy, provider Trymedia has distributed legitimately through Altnet some two hundred million copies of legitimate games produced by over one hundred game producers, including the top ten in the market.[114] Game users on Trymedia can also easily make backup copies, play games on multiple computers, and securely share content with one another. Each time a consumer copies and shares a Trymedia game, the copy automatically reverts to a trial mode that enables sharing. New users may then sample the game for a limited amount of time before purchase is required.[115]

Casual video games came to center stage in the media world in September, 2005, when News Corporation spent $650 million to acquire the game properties of IGN Entertainment (i.e., Game Spy, File Planet, Team Xbox, 3D Gamers, Direct2Drive, and GameStats.com).[116] Some 28 million unique users (mostly young men) now view IGN every month, and over 100 million page views are served monthly.[117] As a major consumer of bandwidth, IGN efficiently scaled its online distribution network with P2P services provided by Red Swoosh, which enables (by a factor of three; see above xx) faster content delivery and savings of forty thousand dollars per month.[118]

Video games are particularly powerful instruments for "in game" product placements. With technology from New York-based Massive, Inc., product developers may create within the game designated message areas – e.g., billboards, character clothing, dialogue – that can be remotely programmed for a number of days or impressions.[119] Messages then may vary by geographic region, season of year, etc..[120] Massive signed contracts in 2005 with the top 10 game publishers; major advertisers now include Coca-Cola, Comcast, Dunkin' Donuts, Honda, Intel, Paramount Pictures, T-Mobile, Universal Music Group and Verizon.

The potential for product placement in games to accommodate geographic differences or seasonal changes is particularly important. For example, Visionary Strategies – a brand strategist in the apparel industry – now places character apparel on online games distributed through P2P networking. This allows their clients to target narrowly the demographic and psychological scope of the intended viewing audience, and to vary the content as seasons and fashions change.[121]

10. CONCLUSION

The new business models, production technologies, and consumer interfaces of the digital market are too "information intense" to be micro-managed from realm of government bureaucracy. Rather, the market complexity of this veritable Petri dish requires that decision-making be instituted at decentralized points where the greatest pockets of information reside. More bluntly, dispersed market agents have more incentive than government regulators/administrators to gather the relevant information that is needed to get the facts right.

Ostrom's above insight brings to mind Hayek's similar vision of a free market as a cybernetic process that allows affiliations, joint ventures, and integrated firms to congeal, modify, and dissolve.[122] Loose and tight hierarchies can then form diverse networks that conceive and digest new ideas; the constellations of forces reconfigure as new information is brought to bear on the problem. If empowered to act through decentralized decision-making, each actor has the incentive to learn more, correct course, and reconfigure his local experiment.

From this economist's perspective, P2P must be regarded as nothing more than an interesting distribution technology that must prove its financial worth and efficiency every day in the market. If the market is to test the appeal of different modes and techniques, property rights must be enforced evenhandedly across all candidates for distributing and transporting content For to do otherwise would privilege particular competitors and bias the outcome in a manner that would expectedly comport with nothing more than legal exemptions granted by an indulgent government. This could in this end lock in the market positions of the appointed technologies, and lock out other technologies that may yet have a wider appeal. .

The message is clear. Content owners and P2P networkers must get to "win-win" positions by solving mutual problems, signing freely negotiated contracts, and coming to understand a new convergence of interest that will bring more semiotic openness to the Internet.

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Matters involving trademark damages have included the Kardashians/BOLDFACE Licensing, Oprah Winfrey/Harpo Productions, Madonna/Material Girl, CompUSA, Steve Madden Shoes, Kohl's Department Stores, *The New York Observer*, and Avon Cosmetics. Matters in publicity right damages have involved Zooey Deschanel, Arnold Schwarzenegger, Rosa Parks, Diane Keaton, Michelle Pfeiffer, Yogi Berra, Melina Kanakaredes, Woody Allen, and Sandra Bullock.

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[119]at http://www.massive.com (retrieved October 5, 2005).

[120]At.visionarymms.com (retrieved October 5, 2005).

[121]Id.

[122]F. A. Hayek, "The Use of Knowledge in Society", 35 AMER. ECON. REV. 519 (1945).