

THE ROLE OF TECHNOLOGY AND CONSUMERS' NEEDS IN THE
EVOLUTION OF COPYRIGHT LAW –
FROM GUTENBERG TO THE FILESHARERS

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*“Copyright laws become obsolete when
technology renders the assumption
on which they were based outmoded.”¹
(Jessica Litman)*

The motto of the present article symbolizes the close intertwining between technological development and copyright law. The symbiosis of copyright protection and technological innovation dates back to centuries and has been closely connected ever since the modern printing press was invented by Gutenberg. In most cases, both society and the rights holders have profited from this symbiotic interconnection, since the new technologies were created for the sake of the people and rights holders became entitled for compensation for the new types of uses as well. The other lesson of Litman's thoughts is that copyright law has become more fragile. There are reasons for this. One is that copyright statutes have almost always been one step behind the technological achievements. The other reason is that users have always seen more options in taking advantage of innovations rather than following the provisions of copyright law (and paying royalty to the authors).

This is evidenced by the heated debates about the emergence of technological innovations. As soon as some new technologies appeared on the market, copyright law and the rightholders reacted on them rapidly: they usually tried to force them back into the shadows. However, the rightholders always understood it within a short period of time that the new technologies are capable to create new works, new types of works, new type of data carriers and new business models as well. The clash between the rightholders' and the society's interests was speeded up by the emergence of digital technologies,² and copyright holders seem to struggle with the permanent lag to address the above challenges. For example before the appearance of digital reproduction machines the multiplication of copyrighted works for private purposes was successfully

¹ Jessica LITMAN: *Digital Copyright*, Prometheus Books, Amherst, 2006, 22.

² Péter MEZEI: Digital Technologies – Digital Culture, *Nordic Journal of Commercial Law* 1 (2010) 9-13.

controlled by the royalty on blank data carriers (tapes, CDs etc.).³ The massive spread of these machines has led, however, to unexpected results. The rightholders have both witnessed the decrease of the amount of the above royalty and the number of the legally purchased copies of their works. The legislators responded to this by the introduction of technological protection measures (or digital rights management)⁴ and stricter law enforcement.⁵ The efficiency and popularity of DRM was refuted shortly after their introduction.⁶ *The late and partially inadequate legal responses on the borderless internet freedoms and the increased needs of consumers, further the ever stricter law enforcement have extremely deepened the abyss between the rights holders and the users.*

The article emphasizes that the obstacle of P2P filesharing is not a unique feature of our times – it is part of the centuries old legal narrative between symbiosis of technology and copyright law. The first chapter summarizes the factors that were necessary to the emergence of copyright protection including the technology (originally the printing press), authors, consumers and legislature. The second chapter will present

³ Cyprus, Ireland, Luxemburg, Malta and the United Kingdom are those members of the European Union that don't have any private copying levy. Historically Germany, Austria and Hungary were the first three countries to introduce the first ever private copying levy: the blank tape levy (1965, 1980 and 1985 respectively). The United States Supreme Court found the use of video tape recorders for purposes of recording television shows at home fair use. See *Sony Corporation of America et al. v. Universal City Studios, Inc. et al.* 464 U.S. 417 (1983). This consequently means that the copyright holders are not entitled to any royalty of blank data carriers in the United States.

⁴ See especially: WIPO Copyright Treaty, adopted in Geneva on December 20, 1996 (hereinafter referred to as *WCT*), Article 11; WIPO Performances and Phonograms Treaty, adopted in Geneva on December 20, 1996 (hereinafter referred to as *WPPT*), Article 18; Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society, Article 6; Copyright Law of the United States of America and Related Laws Contained in Title 17 of the United States Code, § 1201 (hereinafter referred to as *USCA*).

⁵ The *USCA* allows the copyright owner to elect to recover instead of actual damages and profits, an award of statutory damages in a sum of not less than \$750 or more than \$30,000 per infringement. The minimum amount might be reduced to \$200 in case the infringer was not aware and had no reason to believe that her act constituted an infringement of copyright, and the maximum amount might be increased to \$150,000 in case the infringement was committed willfully. See *USCA* § 504. This famous (or infamous) article was amended twice in the course of time. The Berne Convention Implementation Act of 1988 doubled the original minimum awards (\$250, \$10,000 and \$50,000 respectively), and The Digital Theft Deterrence and Copyright Damages Improvement Act of 1999 raised these higher amounts by further 50%. See footnote 5, related to *USCA* §504. The European Union has its own rules on the enforcement of IPRs; however, these do not include anything like the US statutory damages. See Directive 2004/48/EC of the European Parliament and of the Council of 29 April 2004 on the enforcement of intellectual property rights.

⁶ Shortly after the “Content Scrambling System” (CSS) was introduced a talented Norwegian youngster invented the DeCSS software to help the circumvention of the CSS. Within a couple of weeks the DeCSS became widely popular and CSS became technically ineffective means to protect DVDs from unauthorized reproduction. See *Universal City Studios, Inc., et al., v. Shawn C. Reimerdes, et al.*, 111 *F.Supp.2d* 294 (2000). The Sony BMG “rootkit” scandal is a great example how DRM protections might lose their popularity. The Japanese company placed a DRM tool on millions of legally produced and acquired CDs. The “rootkit” software activated itself as soon as the purchaser of the CD tried to reproduce the content of the disc and it injured the CD-ROMs of the users. The scandal led to multi-million dollar damages and an immeasurable loss of prestige on behalf of Sony BMG. See Deirdre K. MULLIGAN / Aaron K. PERZANOWSKI: The Magnificence of the Disaster: Reconstructing the Sony BMG Rootkit Incident, *Berkley Technology Law Journal* 22 (2007) 1157-1232.

that the evolution of copyright law is mainly led by users' demands and the massively accessible supply of new technologies.

The prerequisites of copyright protection

The emergence of copyright protection is due to the appearance and conjunction of four different factors. The first and most well-known reason is the (European) invention of the printing press. This device reformed the manual multiplication market and led to massive reproduction and distribution of written works (mainly books). This factor was known as "*material side*" by the classic Hungarian copyright commentators.⁷ According to Rudolf Müller-Erbach, the representative of the "jurisprudence of interests" school, the birth of copyright law was clearly determined by the invention of printing technology, since copying by hand did not carry the interest to protect manuscripts in the lack of marketability.⁸ The intellectual creations have turned to be marketable due to the emergence of multiplication technologies.⁹ Elemér Balás P. remarked that "the intellectual creations have become negotiable, thus goods".¹⁰

Subsequently, authors demanded an increased protection of their personal/intellectual interests.¹¹ This movement (usually called as "*personal side*") was speed up by the appearance of individualism. From the end of the Middle Age, an increasing number of creators had the ambition to preserve their names for the future. The art historian Jacob Burckhardt noted that the subjective element rose from the renaissance; and humans became intellectual individualities. He argued that no one was averse to attract attention, to be different or look different than the others.¹²

The third reason is the "*consumption side*", where the consumers' demand to become owners of physical copies of intellectual creations has been strengthened in the last two centuries as well. According to Ferencz Toldy "where scientific education and passing the time with reading literature is not a necessity, there isn't any need for intellectual works, and being an author is not a way of living".¹³ The economic potential of the citizens grew rapidly as soon as reading and writing ceased to be a secret knowledge of priest and nobles and literacy of ordinary people increased.

Finally the prevailing *legislative (political) environment* had to be open to settle and regulate the order (balance) between the different interests and actors of publishing industry and the consumers. It is important that the first "copyright related regulations" date back to the 15th-16th century: the kings granted so called "patents" to specific printers, who used these monopolies to exclusively print specific or any kind of books at a designated geographical territory.¹⁴ However, these "patents" were not based on

⁷ Elemér BALÁS P.: *Szerzői jog*, in: Károly Szladits: Magyar Magánjog I, Grill Kiadó, Budapest, 1941, 664.

⁸ Endre NIZSALOVSKY: *Fogalomkutató és érdekkutató jogtudomány, a szabadjogi iskola és a tiszta jogtan*, in: Tanulmányok a jogról, Akadémiai Kiadó, Budapest, 1984, 15.

⁹ Brander MATTHEWS: The Evolution of Copyright, *Political Science Quarterly* (1890) 586.

¹⁰ BALÁS, (op. cit. 7) 684.

¹¹ NIZSALOVSKY, (op. cit. 8) 15.

¹² Jacob BURCKHARDT: *A reneszánsz Itáliában*, Képzőművészeti Alap Kiadóvállalata, Budapest, 1978, 94.

¹³ Ferencz TOLDY (Schedel): Néhány szó az írói tulajdonról, *Athenaeum* (1838) 712.

¹⁴ MATTHEWS, (op. cit. 9) 587-589.

balancing the interests of the authors, publishers and consumers, indeed, they supported only the printers. After a few centuries the debate flared up in respect of the imbalance of interests, which necessarily led to legislation by the kings or Parliaments.

All these factors are clearly evidenced by the first copyright statute of the world. Before the Statute of Anne¹⁵ came into force on April 10th, 1710, printers from the Stationers Company controlled the monopolistic publishing of books. The Company's monopoly was supported (and constantly renewed) by the King as the Company acted as a censor on behalf of the Crown. The need for censorship in England arose from the invention of the printing press occurring roughly at the same time as Reformation and the great geographical discoveries of this time period. These monumental developments opened up the world and consequently the minds of the Europeans and the English Crown felt itself uncomfortable with the possibility that books could become the means of free flow of ideas. Thus, the Stationers Company's printing monopoly guaranteed the publishing of material which would not endanger the privileges of the King.¹⁶ Printers, who were not members of the Stationers Company, could only reach the market with cheap and low quality reprints of books. Tensions originating from this practice were fueled by the borderless distribution of reprints (between Scotland, Ireland and England).¹⁷ The interests of the authors were rarely articulated in the heated debate either, as the Stationers Company's model was based on the exploitation of authors' manuscripts without the constant appreciation of the creators' efforts. The authors could sell their "copy rights" to the printers for a one-time fee but the income from the publications, the author's royalties, was not shared with them.¹⁸

The legislative intent of the Crown brought an important shift in thinking at the turn of the 18th century. Daniel Defoe's arguments in favor of free press served the basis for the protection of authors. Defoe claimed that the ineffective censorship shall be abolished by the introduction of liability for the content of the speech, but as a counterpart to this the rights for the works shall be granted to the authors. The Statute of Anne declared that the rights of reproduction and distribution should be vested in the authors.¹⁹ Although these rights remained transferable, but due to the elimination of the Stationers Company's monopoly anyone could get the authors' permission to print their books. The statute similarly introduced a limited term of protection, which was subject

¹⁵ The one page long Statute of Anne is accessible from the <http://www.copyrighthistory.com/anne.html> website.

¹⁶ MATTHEWS, (op. cit. 9) 589-590.

¹⁷ MATTHEWS, (op. cit. 9) 599-601.

¹⁸ As the Statute of Anne directly stated it: "Whereas Printers, Booksellers, and other Persons, have of late frequently taken the Liberty of Printing, Reprinting, and Publishing, or causing to be Printed, Reprinted, and Published Books, and other Writings, without the Consent of the Authors or Proprietors of such Books and Writings, to their very great Detriment, and too often to the Ruin of them and their Families."

¹⁹ The Statute said the followings: "the Author of any Book or Books already Printed, who hath not Transferred to any other the Copy or Copies of such Book or Books, Share or Shares thereof, or the Bookseller or Booksellers, Printer or Printers, or other Person or Persons, who hath or have Purchased or Acquired the Copy or Copies of any Book or Books, in order to Print or Reprint the same, shall have the sole Right and Liberty of Printing such Book and Books for the Term of One and twenty Years, to Commence from the said Tenth Day of *April*, and no longer."

to renewal. This resulted in the elimination of *de facto* monopolies (everlasting publishing rights) and led to the emergence of the doctrine of public domain.²⁰

This British example is unique. The conjunction of the above discussed four factors was optimal to give birth for the Statute of Anne. All the other countries of the world faced different economical, technological, intellectual, social and political challenges when creating their own national rules on copyright law. One of the results of this is that the content and sometimes the objectives of the domestic statutes differ more or less. The first French Copyright (the so called “Chénier”) Statute was created in 1793, the bloody years of the French Revolution. The basic objective of this statute was the introduction of liability for the content of speech.²¹ The first Copyright Statute of the United States, created similarly in 1793,²² was based upon the exclusive legislative power of the Congress and intended to “promote the progress of science and useful arts”.²³ These provisions focused mainly on new copyrightable works and inventions for the sake of the whole society rather than providing strong and wide protection for unique authors and inventors.²⁴

The balanced environment for the first Hungarian copyright act rose in the second half of the 19th century. At that time, the Hungarian publishing industry was strong, new newspapers and journals appeared on the market, and the Hungarian literature and theaters shined brightly. Although the first few proposals for the copyright code were defeated due to the destructive political climate of pre- and post-Revolution period of 1849-1849, the codex written in 1884 (named after the minister of justice, István Apáthy) was finally supported by all relevant actors of the “copyright industry”.²⁵

The dominance of technology and consumers’ needs in the development of copyright law

The history of copyright law undeniably proves that the development of technology has instigated the most legal changes. This is perfectly shown by the granting of the original privileges/monopolies by the monarchy to book publishers,²⁶ and the first copyright

²⁰ L. Ray PATTERSON / Stanley F. BIRCH / Craig JOYCE: A Unified Theory of Copyright – Chapter 2: The Copyright Clause and Copyright History, *Houston Law Review* (2009) 244-256; Balázs BODÓ: *A szerzői jog kalózzai – A kalózzok szerepe a kulturális termelés és csere folyamataiban a könyvnyomtatástól a fájlcserélő hálózatokig*, Typotex, Budapest, 2011, 55-79. Éva JAKAB: *Szerzők, kiadók, kalózzok: a szellemi alkotások védelmének kialakulása Európában*, Akadémiai Kiadó, Budapest, 2012.

²¹ Anne LATOURNERIE: Petite histoire des batailles du droit d’auteur, *Multitudes* 2 (2001) n 5, 43-46; Tyler OCHOA: *Copyright Duration: Theories and Practice*, in: Peter K. Yu (Ed.): *Intellectual Property and Information Wealth: Copyright and related rights*, Greenwood Publishing Group, Portsmouth, 2007, 141-142.

²² See <http://www.copyright.gov/history/1790act.pdf>

²³ United States Constitution, Article 1, Section 8, Paragraph 8.

²⁴ OCHOA, (op. cit. 21) 142-143.

²⁵ For deep analysis of the historical development of copyright law in Hungary See Péter MEZEI: *A szerzői jog története a törvényi szabályozásig* (1884: XVI. tc.), *Jogelméleti Szemle* 3 (2004) (<http://jesz.ajk.elte.hu/mezei19.html>); Tamás NÓTÁRI: *A magyar szerzői jog fejlődése*, Lectum Kiadó, Budapest, 2010; JAKAB, (op. cit. 21).

²⁶ MATTHEWS, (op. cit. 9) 587-589; Géza KENEDI: *A magyar szerzői jog*, Athenaeum Irodalmi és Nyomdai Részvénytársulat, Budapest, 1908, 7; PATTERSON / BIRCH / CRAIG, (op. cit. 20) 246-248. An unique French

statutes similarly declared only books and other printed works to be protected subject matters, and reproduction (printing/reprinting) and distribution/sale of the physical copies to be exclusive rights of the authors.²⁷ Hence, copyright protection originally did not cover other works of authorship, like sculptures, paintings, choreographs, or buildings. Such (usually unique, not massively marketable) creations were included into the list of subject matters later, when the intellectual interest to protect all creators became strong enough. This list has further expanded as soon as the business and moral advantages of new technological innovations were recognized. Such a great example is the relatively fresh protection of computer programs.²⁸

Yoshiyuki Tamura depicts the joint evolution of technology and copyright law with three “waves”. The first wave was the European invention of printing press that – as mentioned before – served as the cornerstone of the emergence of copyright protection. This original “copy right” protected rights holders reliably against usurpers as long as access to printing machines and the multiplication of printed books remained expensive. The second wave came in the second half of the 20th century with the appearance of analogue reproduction technologies (like the video tape recorders). Consequently, a larger portion of the society had the ability to reproduce protected materials. This second wave led to the modification of several crucial points of the copyright system, especially in respect of the economic rights and the term of protection. Finally, the third wave of the evolution appeared with the spread of digital technologies and the internet. Since these offer the chance for masses worldwide to have easy, fast and cheap access to and use (perfect reproduction) of copyrighted works, the third wave has caused unforeseen challenges for the legislature and the rights holders.²⁹

Tamura’s conception seems to be too selective, since it gears the waving development of copyright law only to the degree of consumers’ access to protected materials. Contrary to Tamura’s theory, numerous other technologies (for example, cameras, television, radio, satellite broadcasting etc.) have been invented during the course of time that led to the codification of new protectable subject matters (for example photographs, motion picture and other audiovisual works, radio and television

example evidences that monopolies were not only granted to publishers of books (literary works). In 1551, Henry II of France gave the first privilege to a lutenist, Guillaume Morlaye, to publish his musical works. See LATOURNERIE, (op. cit. 21) 39.

²⁷ The Statute of Anne protects the printing, reprinting and publishing rights of authors (or other proprietors) of books and other writings. Article 1 of the first US Copyright Act speaks about printing, reprinting, publishing or vending of maps, charts and books. The Chénier Act required the permission of authors for the reproduction, sale and public performance of the copyrighted work. See Lajos VÉKÁS: Joseph Haydn „szerzősszegései” és a modern szerzői jogvédelem kezdetei, *Magyar Tudomány* 4 (2002) 397.

²⁸ Computer programs are protected by domestic legislation since the turn of 70’s. Internationally the first sources include the directive of the European Economic Community (more precisely the Council of the EEC) on the legal protection of computer programs in 1991 (Council Directive 91/250/EEC of 14 May 1991), which is recently codified by Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009. The TRIPS Agreement declared computer software as protectable subject matter (as literary works under the Berne Convention) in 1994. See TRIPS Agreement, Art. 10. Computer programs are protected by domestic legislation.

²⁹ For these waves of the evolution of copyright law and technology see Yoshiyuki TAMURA: Rethinking Copyright Institution for the Digital Age, *WIPO Journal* 1 (2009) 66-68.

programs etc.) and exclusive economical rights (including neighboring rights).³⁰ Notwithstanding the above, Tamura's theory correctly points out that during the last three centuries *most of the challenges, changes and amendments to the copyright system were induced by the newly invented and massively accessible technologies.*

This recognition is mirrored by the constant modifications of domestic copyright statutes and international copyright treaties and agreements as well. On the international level, both the WCT and the WPPT preambles recognize "the impact of the development and convergence of information and communication technologies on the creation and use of literary and artistic works" and "the production and use of performances and phonograms". Similarly both WCT and WPPT recognizes "the need to introduce new international rules and clarify the interpretation of certain existing rules in order to provide adequate solutions to the questions raised by economic, social, cultural and technological developments".³¹

It is similarly undeniable that *the technological development has always correlated with the needs of the consumers' side.* It can be seen that the fate of a given technology depends upon the positive or negative reception for given equipment. Also, many new technological solutions were invented by the producers in the light of consumers' needs. In order to prove the above statements we might take a short look at the history of copyright protection of musical works and sound recordings.

The first copyright statutes of the world did not acknowledge musical works as protectable subject matters as in the majority of cases, the enjoyment of these works took place in closed communities, theaters, churches or nobles' palaces. Later, the increasing popularity of the performance and listening of musical works has guaranteed of marketability of these creations and were finally acknowledged as protectable subject matter in the 19th century.

Besides the revenue from sheet music publications, the composers could have been certain to profit from public performances of musical works as performances required the purchase of sheet music. Before the end of the 19th century, there was not any technology that made it possible to reproduce and distribute sheet music at a low expense. This was dramatically changed by the invention of those technologies that were capable to record and/or display musical works (sound recordings), such as barrel-organ, gramophone, phonogram or radio frequency transmission. Due to these technological developments, however, it has become a real danger that the reproduction or the public display of musical works (sound recordings) might occur without the permission of the rights holders.³² It is not surprising therefore that the invention of any new technology that was capable to use copyrighted works in any way led to intense debates amongst the rights holders.³³ Indeed, most of these debates were settled by the legislators by the widening of economic rights and the institutionalization of licensing (by the introduction of the system of collective rights management).

³⁰ See Paul A. DAVID: *The End of Copyright History? Review of Economic Research on Copyright Issues* 2 (2004) 5-10.

³¹ The WPPT excludes the referral to the interpretation of preexisting rules.

³² LITMAN, (op. cit. 1) 22-23.

³³ LITMAN, (op. cit. 1) 23.

John Philip Sousa, the famous US composer and conductor, testified the following on a congressional hearing (of the third US Copyright Act, finally accepted in 1909) in 1906:

„These talking machines are going to ruin the artistic development of music in this country. When I was a boy (...) in front of every house in the summer evenings you would find young people together singing the songs of the day or the old songs. Today you hear these infernal machines going night and day. We will not have a vocal cord left. The vocal cords will be eliminated by a process of evolution, as was the tail of man when he came from the ape.”³⁴

Sousa’s fears were well-grounded in the sense that the age of communal singing (as he described it) was on the decline. However, *in case the consumers’ need would have been different the talking machines (Sousa was referring to player piano) would disappear from the market.* Indeed, no other new equipment would have been invented in the course of time that would be capable to record, reproduce or display music. To say it differently: *the society took sides with those machines that provided wide access to works rather than the existing copyright regime.* Consequently many new equipments and different data carriers appeared on the market that were designed to enjoy sound recordings mechanically.³⁵ The new home equipments that were capable to display and copy sound recordings made the majority of the society potential infringers. The copyright regime reacted on this challenge successfully by the introduction of royalty on blank tape (later any kind of data carrier).³⁶

The copyright status quo was wounded by the appearance of digital technologies. One of the greatest advantages of Compact Discs was that the quality of the copy was not deteriorated by the reproduction. Another consequence of the spread of digital technologies was that the costs of the production and multiplication of copies decreased radically. The massive expansion of internet, which made the distribution and making available of sound recordings extremely simple, heavily fueled the flames of the copyright war and consequently overwrote the rules of the “digital arena”. As a group of Dutch researchers emphasized:

„Skilful consumers mastering information and communication technology have combined with the development of network capacity to increasingly squeeze the entertainment industry’s traditional business model. Digital consumers, wise to technological possibilities and new applications in the digital arena, are now making demands of products and services – demands that the entertainment industry, stuck in its traditional practices, has failed to meet sufficiently over the past few years.”³⁷

³⁴ Lawrence LESSIG: *Remix: Making Art and Commerce Thrive in a Hybrid Economy*, Bloomsbury, London, 2008, 24-25.

³⁵ Young people probably don’t know anything about technologies like 78 RPM, open reel tape or acetate disc.

³⁶ The first three countries that introduced the blank tape royalty were Germany (1966), Austria (1980) and Hungary (1985).

³⁷ Annelies HUYGEN / Paul RUTTEN / Sanne HUVENEERS / Sander LIMONARD / Joost POORT / Jorina LEENHER / Kieja JANSSEN / Nico VAN EIJK / Natali HELBERGER: *Ups and Downs – Economic and cultural effects of file sharing on music, film and games*, TNO-rapport, TNO Information and Communication Technology, Delft, February 18, 2009, 19 (http://www.ivir.nl/publicaties/vaneijk/Ups_And_Downs_authorized_translation.pdf).

The chain of thoughts could naturally be continued with the introduction of the history and evolution of any other technology that was relevant from the perspective of copyright law, especially like photocopying, photographing or television. However, this is not necessary at the moment.

The present short article was willing to emphasize how the development of technologies and the copyright system correlates with each other. In the light of the above historical experiences, it has been shown why (among others) P2P filesharing – as one of the leading digital challenge of copyright law – appeared so easily at the end of the previous millennium and why did it conquer the heart of the users so rapidly and readily. The standardization of mp3 compression³⁸ and wide-spread Internet³⁹ adoption and accessibility resulted in the reality of sharing small size audio files via faster Internet connections. It is therefore unquestionable which option do the users choose to access musical works: cheap (almost free) filesharing portals⁴⁰ or via purchasing (lawful) copies in music stores (or later online).

To sum up: people (especially copyright lawyers), who are interested in understanding the phenomenon and changes of P2P filesharing should first understand that there is nothing revolutionary in the appearance of this technology. *The emergence of P2P filesharing was a necessity in the light of technological improvement and the constant development of users' demands.*⁴¹

³⁸ MPEG-1 and MPEG-2 Audio Layer III (commonly known as mp3) compression allows around 10 times smaller file sizes than regular audio files. Mp3 encoding was standardized in the first half of the 1990's.

³⁹ Especially the number and price of subscriptions and mainly the bandwidth of connection was decisive in this respect.

⁴⁰ The first ever peer-to-peer file-sharing service was Napster. Napster's protocol was created by Shawn Fanning in 1999.

⁴¹ For further analysis See Péter MEZEI: *A fájlcsere dilemma – A perek lassúak, az internet gyors*, HVGOrac, Budapest, 2012, 13-63.

