

# Two Cheers for the Commodification of Information

*Eli Noam*

## 1. Introduction<sup>1</sup>

This essay takes issue with the notion of “information commodification,” a staple of communications scholarship and advocacy. It concludes that the term has been used in contradictory and non-factual ways. It concludes further that a system of economic transactions in information is, in fact, essential to the future information environment. The reason is not because such transactions establish financial incentives for the creation of information, which is the traditional rationale for intellectual property rights. Instead, it is because transactions in information enable the coordination of numerous activities involving information<sup>2</sup> flows. This changes the terms of the debate from one of private vs. public ownership to one of distributed vs. centralized transactions. The essay sketches how such a system of information transactions would look like. It concludes that it would not only permit the coordination of information but also provide policy makers with a tool to pursue various goals of social and cultural policy. Thus, embedding information in a “commodified” economic system of transactions is actually helpful to its creation, flow, and widespread distribution.

The expression “commodification of information” is trendy. But what does it mean, exactly? It seems to be a broad umbrella that shelters various views, mostly critical, about information, media, and knowledge. The term is used by the academic left<sup>3</sup> as well as the capitalist right, often to mean different things.

---

<sup>1</sup> This essay is dedicated to the memory of Herbert Schiller, who would not have liked the answer, but would have enjoyed the argument.

<sup>2</sup> “Information” as used in this article means “data subjected to organization”.

<sup>3</sup> Schiller, Dan. “From Culture to Information and Back Again: Commoditization as a Route to Knowledge.” *Critical Studies in Mass Communication*, Vol. 11.11, (1994), pp. 93–115. Mosco, Vincent and Janet Wasko eds. *The Political Economy of Information The U. of Wisconsin Press: Winconsin 1988* pp. 27–43.

Microsoft's leaked "Halloween memos" that were featured in the government's antitrust case against the company included the internal conclusion that it should "decommoditize protocols and applications" by "extending these protocols and developing these protocols"<sup>4</sup> In other words, the company should seek a proprietary strategy, likely to involve the exercise and creation of market power, in order to *prevent* a commodification that lowers profitability. In a similar way, McKinsey consultants warn their business clients, in an article entitled *Shedding the Commodity Mind Set* that "with true commodities, you don't get a price premium."<sup>5</sup> Madison Avenue, too, bemoans commodification where advertising is bought in bulk without concern with the surrounding content.<sup>6</sup> Such commodification leads to advertisers viewing different publications as interchangeable, and the ill-fated energy giant Enron, consequently, considered creating a trading market for generic advertising space, including futures contracts, etc. Wall Street has concluded that long distance service has become commodified,<sup>7</sup> and AT&T and MCI WorldCom have been dropped like hot potatoes.

In contrast, the usual scholarly assumption is that proprietary approaches to information are exactly what *causes* commodification by creating ownership and control relations in the information environment, making it unaffordable and under-supplied with respect to the poorer and weaker parts of the population, as well as controlled by large media companies that commercialize its use.

These perspectives on commodification are significantly at odds with each other. Business types do not like commodification because it reduces profits. They pursue "branding" strategies and seek market power in order to offset commodification. Academic and activist critics do not like it because it encroaches on the public sphere. The common element of these perspectives is a negative interpretation of commodification. In contrast, I will argue that commodification is actually a positive and necessary element of the information environment, and not for the usual reasons of incentives and reward advanced by the traditional owners of intellectual property rights in their efforts to expand these proprietary rights. (Because these efforts are retarding the development of the information environment, commodification gets only two cheers in this article).

When a term such as "commodity" gets bandied about loosely to criticize a collection of trends that people do not seem to like, loose thinking inevitably follows. Let us therefore look at the term more closely. It goes back to the Latin

---

<sup>4</sup> Cohen, Josh and Vinod Valloppillil, *The Halloween Documents*, Nov 1998, <<http://www.opensource.org/halloween/index.html>>

<sup>5</sup> Forsyth, John E., Alok Gupta, Sudeep Haldar, and Michael V. Marn, "Shedding the commodity mind-set" *The McKinsey Quarterly*, 2000 No. 4.

Garcia, Jon C. and Jon Wilkins, "Cable Is Too Much Better To Lose." *The McKinsey Quarterly* April 9, 2001.

<sup>6</sup> Jim Meskauskas, "The Commodification of Online Media," <http://www.clickz.com/article/cz.3768.html>, April 17th, 2001.

<sup>7</sup> Uhland, Vicky, "Switchin' To Go." *Interactive Week*. January 15, 2001.

*commodus*, “useful.” In English, its first meaning was benign, “A thing of use or advantage to mankind,” according to the Oxford English Dictionary. The earliest extant use, taking that meaning, goes back to the year 1400:<sup>8</sup> “The land of Inde es the maste plentifulous land of folk that es owerwhare, by cause of the grete *commodietez* that it has therein.” Use of the term in the sense of a convenience or of something useful dates to at least 1430. Shakespeare uses it in 1592 to denote something of value and advantage. “I will turn diseases to commodity.”<sup>9</sup> From there, the term acquired the meaning of an economic good as an article of commerce. Soon, it was anything that one trades or deals in, and by 1608 negative meanings began to be associated, too. “The whore who is called the commodity.”<sup>10</sup> The negative meaning was later elevated by Karl Marx, for whom the commodity concept was central, and who saw it constituting “social things whose qualities are at the same time perceptible and imperceptible by the senses”<sup>11</sup> This was sufficiently cloudy to let the senses of subsequent generations of scholars perceive almost anything into it.

As an economic good, commodity became associated with abundant, mass-produced goods, like cotton, cocoa, minerals or pork bellies traded on exchanges in Chicago or London. “It must be . . . an homogeneous substance of consistent quality throughout so that it may be sold by sample.”<sup>12</sup> From mass product it was only a small step to a meaning of an inferior item, of low quality. It often signifies a highly competitive market in which suppliers are interchangeable. To others, the process of commodification is associated with control by business, especially big firms, of activities that are otherwise not part of market mechanism. This accords with the meaning of the term commodification, by 1970: “the act of turning something into, or treating something as, a (mere) commodity; commercialization of an activity, etc., that is not by nature commercial.”<sup>13</sup> A few years ago, the term began to be applied also to information,<sup>14</sup> especially to the control of communication by large media firms,<sup>15</sup> and to the expansion of intellectual property laws.

<sup>8</sup> *Oxford English Dictionary*, Oxford University Press, 1989, Mandeville (Roxb.xxii.101.)

<sup>9</sup> *Henry IV. 2, I, II*, 1592.

<sup>10</sup> *Oxford English Dictionary*, Oxford University Press, 1989, Dekker, Belman Lond.

<sup>11</sup> Marx, Karl, *Capital, A Critique of Political Economy*. Vol. 1. p. 83, C. H. Kerr & Co., Chicago: 1919.

<sup>12</sup> “Dictionary of Banking and Finance: A Commentary on Banking, Financial Services, and Corporate and Personal Finance,” London; Marshfield, Mass.: Pitman Pub. 1985.

<sup>13</sup> *Oxford English Dictionary*, Oxford University Press, 1989.

<sup>14</sup> Allen, Beth, “Information as an Economic Commodity.” *American Economic Review*.” 80, 1980, pp. 268–273.

<sup>15</sup> Schiller, Herbert I. *Who Knows: Information in the Age of the Fortune 500*, Ablex Publishing Corp, NJ. 1982.

## 2. The Meaning of Commodification

Thus, several quite disparate and contradictory elements are thrown together in the term commodity and to its application to information. We will now discuss the various meanings in turn. We will not attempt to determine which meaning is the most appropriate; rather, we will try to evaluate the validity of the negative connotation associated with each.

### 2.1 COMMODITY AS A MASS PRODUCED GOOD

The first meaning of commodification is that of a *massification* of information and its production with the implicit belief that mass-produced information has a lower quality than more selectively created information.

Obviously, there has been a huge increase in information production and producers. Already 40 years ago it was observed that 90 percent of all scientists who ever lived were still alive.<sup>16</sup> Most branches of science show exponential growth of about 4–8 percent annually with a doubling period of 10–15 years. There are more than 80,000 scientific and technical journals, and more than 1,500 scientific abstracting periodicals. To get a sense of the trend: At the beginning of the 20th century, *Chemical Abstracts* took 32 years of publication (1907 to 1938) to list one million abstracts. The fifth million, near the end of the century, took only three years and four months, 1/10 of the time.<sup>17</sup> Wherever one looks, more book titles are published than ever before, 60,000 in the U.S. in 2000, compared with 15,000 in 1950 and 8,000 in 1900. More magazines are published, about 22,000 in the U.S., with 1,000 new titles each year. There are fewer newspapers than before, but those that have survived are thicker than ever. For television, where once about five channels were available to the American viewer, there are now more than 200 different channels offered by cable and satellite. Similar trends can be observed in all developed countries.

According to one study,<sup>18</sup> unique information produced annually in the world is 1–2 exabytes (1–2 billion gigabytes). This translates to about 250 megabytes produced per human being. (Of these, printed documents comprise only .003 percent. One country alone, the U.S., produces about 25 percent of all textual information and 30 percent of the photographic information).

---

<sup>16</sup> Price, Derek J. de Solla. *Little Science, Big Science*. New York: Columbia University Press, 1963, pp. 73–74.

<sup>17</sup> Noam, Eli. "Electronics and the Dim Future of the University," *Science*, Vol. 270. p. 247–249, 1995.

<sup>18</sup> Lyman, Peter. And Varian, Hal R. "How Much Information?" *The Journal of Electronic Publishing*, Vol. 6.2, December 2000.

An increase in the creation of information should be viewed as a positive trend, unless it means a reduced quality of information. Information does not decline in usefulness just because there is more of it. But is the quality aggregate of newly created information declining over time? This is a difficult question to answer, starting with the very definitions of "quality" and "information." In the past, too, much inferior information was created, but most of it has, mercifully, not been preserved. One should expect mostly exemplary work to be culled, saved and transmitted across generations. We remember the best of Shakespeare and have forgotten almost all of his contemporary wordsmiths. A viewing of a typical movie from the '40s or TV show from the '50s should quickly dispel any romanticization of past quality of media content. One empirical study, by the author, measured the increase of TV programs by content categories, in particular of quality categories.<sup>19</sup> Since 1969, total program hours per week offered over TV and cable TV has increased in New York City to more than a half million program hours per year.<sup>20</sup> Compound annual growth rate has been more than 10 percent for at least 30 years. Growth in the supply of TV content has been above average for several content categories usually associated with quality, such as documentaries, news magazines, health/medicine, and science/nature. All of these show annual growth rates of about 12 percent. Below average – but still substantial – growth rates exist for quality children programs (7.6%), foreign language programs (9.5%) and education (9.4%).

It is always difficult to define and measure quality of content. But from the limited evidence, it does not appear that the mass production of information that is one meaning of commodification has led to low quality of information. Where such decline in TV has occurred it was based on the loss of exclusivity of public service TV in Europe.<sup>21</sup> To demonstrate a further reduction based on quantity, it would require substantial empirical evidence rather than assertion. Of course, more garbage programs are being produced; but so is high-quality information, as well as any other content category.

## 2.2 COMMODITY AS HOMOGENEITY

A second meaning of the term "commodity" is homogeneity – undifferentiated and largely interchangeable products, like orange juice futures traded in Chicago. As mentioned, the commercial characteristic of a commodity is being sold by a sample. Yet for information, the opposite is the case. The more information there is, the more specialized it must become, and the *less* homogenous it therefore is.

<sup>19</sup> Noam, Eli. "Public Interest Programming in American Television," in Eli Noam and Jens Waltermann eds., *Public Television in America*. Bertelsmann, 1998, pp.145–175.

<sup>20</sup> In terms of channel capacity, New York City is in the top third among cable areas but by no means near the top.

This should be obvious if one looks at the increasing specialization of scientific journals, music formats, or web sites. Yet many people believe that the evolution of the commercial TV environment has simply led to "more of the same", to a multiplication of commoditized content. But it would not make sense to duplicate content even within a profit-maximizing paradigm. A commercial broadcaster maximizes advertising revenue by maximizing desirable audiences. This is the case at the peak of a normally distributed audience. Additional commercial broadcasters will position themselves slightly differentiated relative to the incumbent broadcaster. They do not offer quite the same programming type. As the process continues with additional channels, the total range of program types widens.<sup>22</sup> A gradual differentiation rather than homogeneity is the rational strategy.

When commercial TV in the U.S. was limited to a handful of channels, aiming at a minimum of 25 percent of the audience for a program to survive, programming was indeed centrist in orientation. This, indeed, was "commodity TV." But this has given way to narrowcasting to audience slices of less than one percent, and, in the near future, to customized and individualized programming over the Internet to still narrower audiences.<sup>23</sup>

The offering of new program networks has accelerated. Whereas in 1992, 20 new program channels were concretely proposed or offered to the cable operators, in 1993 it was more than 40, and in 1998 more than 100.<sup>24</sup> These include channels on a wide variety of increasingly specialized topics, including wrestling and astrology, but also programs on more respectable topics, such as art performances, books, computers, classic arts, programs for the deaf and disabled, the environment, health, history, human development, independent films, jazz, lectures, museums and exhibitions, and public affairs. Thus, we cannot conclude that homogeneity in the information created has occurred. Quite to the contrary.

### 2.3 COMMODITY AS CHEAPNESS OF INFORMATION

Another set of meanings associated with the term commodity is "inexpensive" and "highly competitive." This is the negative meaning given by the supplier industry and reflected in the quotes from Microsoft and McKinsey provided earlier. From a consumer and public perspective, why should a low price be considered a problem? Paperbacks and cheap paper made books widely affordable. Inexpensive

<sup>21</sup> Noam, Eli. *Television in Europe*. 395 pp., Oxford University Press 1991.

<sup>22</sup> Noam, Eli. "A Public and Private-Choice Model of Broadcasting," *Public Choice*, 55, 1987, pp. 163-187.

<sup>23</sup> Noam, Eli. "The Stages of Television: From Multi-Channel Television to the Me-Channel," Contamine, Claude, & van Dusseldorp, Monique, eds., *European Institute for the Media*, 1994, pp. 49-58.

<sup>24</sup> Noam, Eli. "Public Interest Programming in American Television," in Eli Noam and Jens Waltermann eds., *Public Television in America*. Bertelsmann, 1998, pp. 145-175.

movies and records brought performances and music to the masses. A typical cable TV system provides almost 10,000 hours of programs per week. On a per hour basis it costs the subscribers less than one tenth of one cent. Newspapers provide hundreds of up-to-date stories written by some of the best journalists, produced and delivered within a few hours, at a cost of less than one cent per page. Internet service provides access to largely free information at a connectivity price, on average, for Internet and telephone of less than one cent per minute.

That information should become cheaper makes economic sense in a long-term way. More information than ever is being created and distributed, while the ability of individuals and society to use and absorb it does not rise as fast.<sup>25</sup> In consequence, one should expect prices for information to fall, in the same way that the price of food has declined over the past centuries as its production increased faster than aggregate appetites. And as information becomes cheaper, more of it is used by more people. It becomes more widely affordable and more broadly disseminated across the social spectrum and, due to its sheer quantity, less easy to control. All this should delight the users of information content and of its distribution channels. If anyone should be unhappy about this form of commodity it is the creators, producers, and distributors of information. They find their profit margins lowered by competition for audience's attention. This is the type of commodification they dread. They counter it by attempts to reduce competition through concentration in the market structure. They try to differentiate (rather than homogenize) and to create "brand" images for products and producers that enable the changing of higher prices.

Thus, if anything, the goals of public policy should be to uphold this kind of commodification in its meaning of competitive and inexpensive.

#### 2.4 COMMODITY AS COMMERCIALIZATION

Perhaps the major meaning of the term "commodity" in academic critique is its commercial dimension. Information becomes a private good, produced and sold according to profit criteria. To Herbert Schiller, it was becoming "something which, like toothpaste, breakfast cereals and automobiles, is increasingly bought and sold."<sup>26</sup> It enters the stream of commerce without special consideration for the intellectual content behind it. It is part of a larger commodification process of the capitalist system. The expansion of the market to information and its unequal distribution makes many people uneasy. Jeremy Rifkin worries that "when the

---

<sup>25</sup> Noam, Eli. "Overcoming the Last Communications Bottleneck", *Optics and Photonics*, 1993, pp. 23-25

<sup>26</sup> Schiller, Herbert I. *Who Knows: Information in the Age of the Fortune 500*, Ablex Publishing Corp, NJ, 1982.

culture itself is absorbed into the economy, only commercial bonds will be left to hold society together."<sup>27</sup>

The meaning of commodification as privatization and commercialization goes back to Marx. Under capitalism everything becomes a commodity; everything can be bought and sold. Under capitalism, production is not determined primarily by "use value", e.g., some intrinsic merit of the work, but of "exchange value", i.e. of how markets evaluate it, which in turn is defined and created by the societal power and class relationships of the production process.<sup>28</sup> If one accepts this, it suggests that the commodification of information is not really new, not really part of the digital revolution or of recent media concentration, but that it has existed for centuries.<sup>29</sup>

Gutenberg printed his bibles to sell them as part of a commercial venture. His unabashed goal was not religion but personal enrichment. The Globe Theatre in London charged admission to Shakespeare plays. Rembrandt sold his paintings and they were resold to others. It is not easy to locate a golden past when information of value to many was not jealously guarded or meted out as a special privilege, but rather freely given away with no expectation for reward. We know about Gutenberg mostly from the court records of his litigations against the unauthorized users of his various inventions. Thus, the criticism inherent in the meaning of commodity as commercialization is inconsistent and ahistorical.

The fundamental forces at work today are the transformation of advanced societies into information-based economies, with information becoming a major input of economic and societal activities, and the main activity of individuals and organizations the production of information or of instrumentalities that assist in that process. Given the increase in the quantity of information produced, and the relatively static amount of attention available for its absorption, the information needs to be of increasing attractiveness to the user. All this – quantity and quality – requires considerable and rising effort, organization, and investment. In consequence, the individuals and organizations involved will not usually give the product away freely. Even if much of the information were to be created by public entities and distributed freely, in any free society there would still be many independent creators and media outlets outside the public system, and commercialization would remain even if its scope is reduced.

---

<sup>27</sup> Rifkin, Jeremy, "Behind Merger Hype: Hypercapitalism; Business: AOL-Time Warner marriage shows just how far we've come toward commodifying culture." *The Los Angeles Times*; Los Angeles, CA; January 13, 2000.

<sup>28</sup> Böhm-Bawerk, Eugen von. *The Exploitation Theory Of Socialism-communism*. South Holland, Ill.: Libertarian Press, 1975.

Perry, John. An Evaluation of the Practitioner-team Ethic towards developing the Concept of the Learning Organization, 1998, <<http://www.cultsock.ndirect.co.uk/MUHome/medintro.htm>>

<sup>29</sup> Some people try to get around this problem by distinguishing the container of information, e.g., the artifact "book," from the information itself, but that is distinction without much difference.



While the commercialization of information and its means of distribution has existed for centuries, it has expanded in scope, as will be described below. It is classic that any expansion of the realm of the market leads to objections against encroachment of the "realm of rights". Markets in credit were or are still prohibited by some religions as sinful. Markets for air pollution elicit howls of protest. Most societies oppose the selling of justice,<sup>30</sup> health, babies, sex, public offices, and legal rights. In almost all cases these transactions take place anyway.

This is not to denigrate those objections, but to put them into a larger perspective. Legal rights, in a democracy, are distributed in a more egalitarian fashion than markets would distribute them. But rights are only a first distribution, followed by subsequent exchange transactions in which participants try to better their situation. Information, similarly, even if distributed freely, would be "enhanced" by private efforts, as happens to most governmental information, and subject to market forces.

The trend toward markets is by no means uni-directional. Military and civilian officers used to be formally for sale, but are not anymore. Conversely, the "rights" regime of the universal male military draft has given way to a market system of recruitment. In information too, trends and counter-trends exist. If anything, today in the age of the Internet, information of value is shared as a principle. The amount of useful but free information on the Internet is entirely without precedence.

Many categories of information would be adequately produced under a private commercial regime. But in other cases, such as basic research, a commercialization would lead to an underproduction since only the information's value to the private producer is factored in. Basic research has a considerable multiplier value, which a private firm would not consider in its investment decision. This is the reason for the public financing of much of basic research. University researchers do not truly give away information as a gift. They create the information as part of their employment deals with universities that are funded largely by public monies, and later distribute it as part of their status and career advancement.

The alternatives to intellectual property would not be palatable, either. In the absence of property rights, creators of information are not likely to give it away freely, but would engage in various stratagems of secrecy, contractual obligations<sup>31</sup> to non-disclose, etc. The alternative to property rights has been in the past based on benefactors, rewards, or an employment relation, with an associated dependency status for creators.

A commercial system of information does not negate parallel models. Happily, direct financial incentives are not the only motivator for humans to create and

---

<sup>30</sup> Mohr, Richard. "Commodification of Justice and the 'Re-Privatization' of Private Property." Prepared for the conference *Commodification: Theories, Practices, Histories and Representations*. University of Wollongong, February 19-20, 1998.

<sup>31</sup> Libecap, Gary D. *Contracting for Property Rights*. Cambridge, UK: Cambridge University Press, 1989, p. 10.

contribute information. Information can be given away as a gift, exchanged, shared as a community, or donated to the public. This means that one can maintain non-commercial forms of information exchange without negating commercial ones.

Under most circumstances, information is most likely to be freely offered when it has only limited value to a wider audience; as part of an eleemosynary distribution; and when it is part of a collaborating community. There is room for all these arrangements but they are not likely to serve as a foundation of an economy based on information.

## 2.5 COMMODIFICATION AS CONTROL BY BIG MEDIA COMPANIES

The real fear of commercialization is embodied in the meaning of commodification as the control of information by media giants.<sup>32</sup> In that view, the commercialization of information takes place because large media companies push it. But this is loose reasoning. Large firms are not primarily the cause for commercialization of information but just as much its result, though of course there is an interaction, as will be discussed below. The commercialization of information as based on the much larger secular trends of a knowledge-based society and economy.

The basic economic problem of information is how to cover the cost of its creation when reproduction costs are low while its initial creation (first copy cost) is expensive. The concentration and expansion of media companies is the result of the desire to extract higher returns from the information than would be possible in a competitive market structural when prices are driven to the low incremental cost. As Geoffrey Mulgan points out, "unless information can be kept scarce it cannot command a price. Without a price, private capital has no incentive to provide it. If production industries are unable to control the commodity form of what they produce the end result will be massive underproduction."<sup>33</sup>

Libraries, in particular, have vocally complained about market power in the serials they acquire. Their main problem, however, is the relentless expansion in production of titles, which face ever-narrower slices of individual subscribers, hence increasing the cost share and, thus, price to cover the cost for an increasing

<sup>32</sup> Schiller, Herbert I. *Who Knows: Information in the Age of the Fortune 500*. Ablex Publishing Corp, NJ, 1982.

Mosco, Vincent and Janet Wasko eds. *The Political Economy of Information The U. of Wisconsin Press:Winconsin 1988*; Sunstein, Cass. "Television and the Public Interest," *California Law Review* (2000); Baker, Edwin C. "The Media that Citizens Need" 147 *U. of Penn L.Rev.* 317 (1998).

<sup>33</sup> Mulgan, Geoffrey J. *Communications and Control: Networks and the New Economies of Information*. Guilford, NY, 1991.

number of publications. Market power is merely a problem on top of a problem. And the solution – the electronic publishing of serials – is at hand.

The desire by firms to form oligopolies for the purpose of keeping prices high is not unique to the information sector, but is prevalent across industries. The response to oligopolistic gasoline prices is not, however, to give it away for free, but to deal with the underlying oligopolistic market structure, such as through antitrust enforcements. The same holds true for information. The problem of high prices for music is not due to the fact that recordings are not given away freely or that musicians and composers are over-compensated, but primarily due to the highly concentrated industry structure for recorded music, where five firms dominate and engage in efforts to reduce that number further. Private firms have incentives to try to create oligopolies, and the purpose of governmental antitrust actions is to maintain competition in the instances where market forces do not. This is particularly true in those instances where network effects and compatibility requirements enable the leveraging of market power in one segment of the information sector to control other segments, too. Microsoft is an example of such a situation, and it has led to government antitrust action. Local cable TV distribution has some elements of this potential, and it has led to various regulated access requirements for distribution and content.

## 2.6 COMMODIFICATION AS THE EXPANSION OF INTELLECTUAL PROPERTY

Clearly, there has been a relative expansion of the scope of intellectual protection laws, which suggests a widening of the commercial sphere of information at the relative expense of the public sphere.<sup>34</sup> Words of the language are becoming owned by trademark holders. Business ideas can be patented.<sup>35</sup> Fair use gets squeezed. Distribution architecture gets controlled.<sup>36</sup> University researchers cease circulating results and start patenting them.<sup>37</sup> Genetic life forms are being owned. These are disturbing trends, though one should not lose perspective. It is grating if words like “polo” are claimed by a textile designer and his aggressive lawyers; but the English language has more than one million words, most of which are under-utilized and

---

<sup>34</sup> Bettig, Ronald. “Critical Perspectives on the History and Philosophy of Copyright.” *Critical Studies in Mass Communication* (1992).

<sup>35</sup> *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998). Merges, Robert P. “As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform,” 14 *Berkeley Tech. L.J.* 577 (Spring 1999), at <<http://www.law.berkeley.edu/institutes/bclt/pubs/merges/>>

<sup>36</sup> Fitzgerald, Brian F. “Software As Discourse: The Power Of Intellectual Property In Digital Architecture” 18, *Cardozo Arts & Entertainment Law Journal* 337, 2000. Lessig, Lawrence, *Code and Other Laws of Cyberspace*. New York, NY: Basic Books, 1999.

<sup>37</sup> Kahin, Brian, “The Expansion of the Patent System: Politics and Political Economy,” *First Monday*, <[http://www.firstmonday.dk/issues/issue6\\_1/kahin/](http://www.firstmonday.dk/issues/issue6_1/kahin/)>, December 2000.

wide-open, and each year probably more new words are created freely than subtracted commercially.

Similarly, while some academic research is being privatized – as it always had been – there is also more research taking place than ever. In the past, even life forms were protected: silk worms had to be smuggled out of China into the West, at pain of death.

Clearly, the traditional pragmatic balance between private incentive and public sphere has shifted. However, this imbalance may eventually right itself as stakeholders inevitably over-reach and reaction sets in.

The expansion of intellectual property has been likened to an encroachment by the market (sanctioned by courts and legislatures) on the public “commons.” The image of the enclosure of the commons has been powerful on early socialist writers. In Britain, common lands for grazing were enclosed and appropriated by private owners, especially in the early years of the industrial revolution, leading to the plight of small farmers and their migration to the industrial cities. This image is now being transferred to information. But is it apt? Enclosure or not, it is clear that agriculture was greatly over-staffed, and employment had nowhere to go but to shrink. Industrial factories provided the major alternative for work, aside from emigration. In contrast, information is a booming and expanding sector.

Furthermore, the public sphere of the commons should not be romanticized. If truly open in terms of access, a commons attracts the kind of over-utilization described in Hardin’s *The Tragedy of the Commons*.<sup>38</sup> It will thus not literally be open to all and free from restrictions. This makes the commons subject to the political process of allocation. In the U.S., grazing land, timber, and mineral deposits have notoriously been regulated to benefit favored constituencies. Free access to cable TV has been primarily granted to established commercial broadcasters. Furthermore, openness is not the only value to uphold but has to be weighed against others, such as privacy. Thus, declaring something a commons is not the end of a debate over access rights and obligations but only its beginning where conflicting uses and values exist, as they invariably do.

As applied to information, the concept of the commons, in contrast to land or resources, is vague. To some it means a rollback in the reach of copyrights, trademarks, and patents. To others, it means a public access to private media of distribution such as cable TV. To others it means the creation of a publicly financed or owned infrastructure dedicated to public access.<sup>39</sup> To still others it is the absence of private licenses for spectrum and their replacement by user fees<sup>40</sup> or

<sup>38</sup> Hardin, Garrett, “The Tragedy of the Commons,” *Science*, 162, 1968. pp. 1243–1248.

<sup>39</sup> Benkler, Yochai. “Property, Commons, and the First Amendment: Towards a Core Common Infrastructure.” White Paper for the First Amendment Program. Brennan Center for Justice at NYU School of Law, 2001

<sup>40</sup> Noam, Eli. “Taking the Next Step Beyond Spectrum Auctions: Open Spectrum Access.” *IEEE Communications Magazine*, (December 1995), pp. 66–73.

no charges.<sup>41</sup> In principle, it is not clear why a public ownership of infrastructure is needed when most of its functions can be met by common carriage,<sup>42</sup> the traditional form of opening transportation and communication, and/or by principles of non-discriminatory "Third Party Neutrality," proposed by the author.<sup>43</sup>

A classic instant for the commons was the Internet in its early "frontier" years. As with any frontier situation, soon individuals begin to carve up profitably parts for themselves.<sup>44</sup> The early web browser, Mosaic, was developed at the University of Illinois. An entrepreneur recruited the core development team, upgraded Mosaic into the incompatible Netscape browser, and became a billionaire. Such expropriators of the commons became folk heroes as paragons of entrepreneurship. But one should also recognize that the huge wealth thus created also provided a powerful incentive to an astonishing burst of energy in various industries, regions, and countries. Thus, the Internet was accelerated beyond its otherwise likely trajectory of a government project by both greed and voluntarism. Both are at odds with each other, yet each seemed to have been indispensable to the Internet.

### 3. Why transactions in information are essential

So far we have described the weakness in the negative interpretations of the various meanings of "commodification of information." We will now argue in favor of such commodification as an essential part of an environment in which huge amounts of information get created, distributed, processed, and used. If anything, transactions in information will inevitably increase. They will do so as part of a wider transaction mechanism because this will be by far the best way to coordinate activities involving information.

---

*cont.*

Noam, Eli. "Spectrum Auctions: Yesterday's Heresy, Today's Orthodoxy, Tomorrow's Anachronism." *Journal of Law and Economics*, December 1998. pp. 765-790.

<sup>41</sup> Gilder, George, "Auctioning the Airways," *Forbes*. April 11, 1994.

Benkler, Yochai, and Lessig, Lawrence, "Will Technology Make CBS Unconstitutional? Net Gains." *The New Republic*, 2000.

<sup>42</sup> Noam, Eli. "The Tragedy of the Common Network: Theory for Formation and Breakdown Public Network," in *Private Networks, Public Objectives*, Elsevier Science B.V., Amsterdam. (1996) pp. 51-64. Noam, Eli. *Interconnecting the Network of Networks*, Cambridge, MA: MIT Press, 2001.

<sup>43</sup> Noam, Eli. *Interconnecting the Network of Networks*, Cambridge, MA: MIT Press, 2001.

<sup>44</sup> Bollier, David, "Public Assets, Private Profits: Reclaiming the American Commons in an Age of Market Enclosure." *New America Foundation*, Washington, DC. 2001. <[http://www.newamerica.net/events/transcripts\\_texts/PA\\_Report.pdf](http://www.newamerica.net/events/transcripts_texts/PA_Report.pdf)>

The key fact about information is that it has increased in volume and applications, and in consequence there is so much of it moving around in ever-increasing complex arrangements that it becomes difficult to control directly. In consequence, information is increasingly channeled by and to machines rather than people. Soon, automobiles will be communicating directly with highways, packages with shippers, suitcases with airlines, light bulbs with utilities, and TV sets with film distributors. The information flows over wires and fibers, over the air, navigating various and shifting technical, economic, and legal bottlenecks.

How can such a system function in operational and economic terms? Not by human control except on the macro level of basic principles and rules of full-time supervision. Not by giant firms dealing with each other to account for trillions of transactions. Not by centralized machines. Not even by networked machines controlling from a distance. Too much transmission and processing would be used up by each piece of information having to be controlled from the distance, report back, receive instructions, account for itself, etc.

Computer scientists begin to recognize that the only feasible way to manage these information flows is by decentralizing and decomposing the control into numerous small and automated transactions.<sup>45</sup> Decentralized "invisible hand mechanisms"<sup>46</sup> function as huge information processing machines for the myriad of transactions of society in a way that centralized decision-makers in government or industry cannot.<sup>47</sup>

In earlier times the decentralization of information was accomplished by pushing the decision mechanisms down the hierarchy, from the state level to that of companies, institutions, and individuals. But now, with the increasing complexity of the environment, it becomes necessary to push them down again, to the level of the information itself. Information needs to be engaged in direct transactions that involve it.

What does this mean and how could it be accomplished?

The key here is to understand that information and its transmission networks are moving from continuous streams of analog or digital signals, to discrete

---

<sup>45</sup> Davis, Randall & Smith, Reid G. "Negotiation as a Metaphor for Distributed Problem Solving," *Artificial Intelligence* (1983); Waldspurger, Carl A. "A Distributed Computational Economy for Utilizing Idle Resources," Master's thesis, Massachusetts Institute of Technology, (1989); Wellman, Michael P. "A Market-Oriented Programming Environment and its Application to Distributed Multi-commodity Flow Problems" *Journal of Artificial Intelligence Research*, 1:1-23, (1993); Miller, Mark S. & Drexler, K. Eric. "The Agoric Papers," *The Ecology of Computation*, Amsterdam: Elsevier Science Publishers, B. V. (1998); Bogan, Nathaniel. "Economic Allocation of Computation Time with Computation Markets" (1994); Ferguson & Yemini. "Economic Models for Allocation Resources in Computer Systems" mimeo (1996); Sairamesh et al. "E-Marketplaces: Architecture, Trading Models, and Their Role in Bandwidth Markets" mimeo (2000).

<sup>46</sup> Nozick, Robert. *Anarchy, State, and Utopia*, New York: Basic Books, 1974

<sup>47</sup> Hayek, Friedrich A. von. *The Road to Serfdom*. University of Chicago Press. 1944.

packets transmitted discontinuously. The information is labeled by sender, location within a document, and other operational data.<sup>48</sup>

This principle of identifiable information associated with an address is an enormously powerful concept. The next step would be to add payment mechanisms and other instructions. Thus, information could operate on its own in a decentralized fashion, without continuous control and guidance, and engage in "nano-transactions" for access, transmission, storage, processing, and other information.

### 3.1 SOCIAL POLICY GOALS

One implication of such identifiable packets is that information can be treated in a highly differentiated fashion. Counter to the claim of information becoming an undifferentiated commodity or that technologically "a bit is a bit,"<sup>49</sup> actually quite the opposite will be happening. Each packet has an address, sender and recipient, and soon other identifiable information. This means that different packets can be treated quite differently.

The ability to identify has significant implications for future public policy. It opens entirely new avenues for various mechanisms on the level of information. (We can call this "nano-regulation.") For example, one could establish – if that were the policy decision – price differentiation in favor of certain uses or users, such as education of rural users or students. Subsidy mechanisms could be established in which some users, such as the poor, would get free or cheaper access. Various meritorious content could receive preferential treatment, etc. This would deal with the most objectionable aspect of any market mechanism, its distributional impact. For almost any purpose, government has at its disposal a tool that is quite powerful for whatever purpose the public decision process determines is desirable. The scope of these policies is based on legal, constitutional, and political considerations, not on technical or practical ones. Of course, there will be resourceful people who keep a step ahead of enforcement capabilities; but that does not negate the basic point: the mechanism of transactions in information enable control and liberation, concentration and openness.

### 4. CONCLUSION

In light of the expansion, differentiation, diversity, and increasing affordability of information, it is hard to understand on what data the thesis of information

---

<sup>48</sup> Baran, Paul. "History, Alternative Approaches, and Comparisons," RM-3097-PR. 1964.

<sup>49</sup> Negroponte, Nicholas. *Being Digital*. Knopf, New York, 1995.

commodification is based on, other than on pressures to expand intellectual property rights into areas where they did not exist before.

Our discussion finds multiple meanings for "commodity" and "commodification" that are at odds with each other. For some it means cheap, to others expensive. To some it means homogenous, to others proprietary. To some it means excessive control, to others excessive competition. Yet neither of these views is especially persuasive.

The debate over the commodification of information needs to be seen in context. Information used to be a scarce good. It is now abundant. From this many consequences flow. For a long time information was controlled by the state. It was produced and disseminated by state-controlled institutions like monasteries, schools, universities, telecom networks and television networks. The underlying organizational logic was that information was scarce and hence valuable, and had to be produced, distributed, and shared under some public control. A body of theory provided the intellectual underpinnings, such as those of natural monopoly, public goods, industrial policy, and economic development planning.

With information becoming plentiful, its production and distribution grew in volume and complexity. The system became too complicated for any single organization, whether a school system, a monopoly telecom provider, a broadcaster, or a cable TV firm, to run well, and for government to supervise. The state control model broke down. This called for a different treatment.

The new model was one of markets and property rights. The basic idea was that anybody could enter the information sector, that markets would provide the control functions, and that property rights would provide incentives.<sup>50</sup> This transition created losers, such as traditional public service broadcast organizations that had functioned as the gatekeepers for the creativity of entire societies. It also created winners, such as major media companies. The debate over commodification is part of this struggle. But it is not forward-looking. The property rights perspective is dominant in the present, but not for the future.

The property rights approach worked best in the information sector when it dealt with "old economy" physical assets, such as wire line networks competing with each other. It had only spotty explanatory power when it came to the new digital environment. Its thinking could not help with the most interesting new developments in communications, except in a labored way. Network externalities and communities do not fit into the property rights analysis, just as economics in general had a difficult time with externalities. The whole Internet must be a property rights advocate's intellectual nightmare.

---

<sup>50</sup> Posner, Richard A. *Economic Analysis of Law*. Aspen Publishers., 5th ed. January 1998. Barzel, Yoram *Economic Analysis of Property Rights*, 2nd ed. New York, NY: Cambridge University Press, 1997. Demsetz, Harold "Toward a Theory of Property Rights," *American Economic Review*, v. 57, 1967, pp. 374-359. Umbeck, John R., *A Theory of Property Rights* Ames, Iowa: State University Press, 1981.



The reason why the property rights approach has hit its limitations is that just as the state approach before, it, too, cannot deal with the new levels of complexity that the digital environment is rapidly creating. But most of the critics of the property rights system and its co-modification are also reacting to the past. The key to thinking about the next stage of the information economy is not property but transactions.<sup>51</sup>

This essay concludes that the expansion of a transaction-based system of information creation and distribution will be an essential – and beneficial – part of the information environment, and that it will enhance the ability to create information. Furthermore, it will enable the distribution of information according to societal policy determinations. Thus, such a transaction-oriented commodification deserves our cheers, not condemnation.

---

<sup>51</sup> This transaction approach goes back to Oliver Williamson see Graff, Jamison. *An Introduction to the Work of Oliver Eaton Williamson*. <<http://users.iems.nwu.edu>.> June 1995, with some credit to Ronald Coase ("The Problem of Social Cost." *Journal of Law and Economics*, 1960). Williamson explained organizations' size and structure by their desire to minimize transaction cost. Hierarchical control of internal transactions reduced their costs below those of market coordination. This led to large firms and other organizations. Today, for information, external transaction and internal coordination costs are radically changing, and their relative magnitude should greatly affect the size and structure of firms and industries.