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The Article highlights the language of the digital and the principle of modularization as the basic concepts which the further development of the information environment will have to pivot around, regardless of how conflicts between freedom and control are temporarily solved. Perceiving both the computer and the Internet as complex systems, the authors look at how modular design of these systems freed the functionality of applications from the physicality of infrastructures, describe the evolutionary gains adhering to modularity, and how to preserve them – elaborating on the issues of access to the cable platform for broadband Internet and to virtual networks for computer technology. Their second focus shows how digitalization of information makes possible the merger of content and its protection. Especially through the use of DRM systems, private actors can create right enforcement mechanisms independent of the State. The legal system therefore faces new and more complex relations between private will and public sovereignty. In such a merged system it is harder to maintain freedom – much like in the fusion of function and infrastructure.

I. INTRODUCTION

In the era of digital language and networks the traditional model of the liberal State is challenged by the rise of a pervasive information environment. This Article tries to disclose the forces which underlie central developments of such environment.

We look at two elements of the digital environment, namely the *principle* of "modularization" and the *language* of the "digital". The focus will be on the phenomena based on those elements: the modularization of information systems and the digitalization of information. In other words, we are more engaged in describing design

parameters, rather than solving design problems. To name the parameters of potentiality at the same time will provide a basis for an analysis of the trade-offs attached to specific design choices. So our approach does not imply that we would not take a stand in the pertaining discussions. In fact, we do make prescriptive arguments. But our focus is to highlight the basic concepts that the further development of the information environment will have to pivot around – regardless of how the conflict between freedom and control is temporarily solved.

Part II concerns the principle of modularity in the development of the Information Society. Used as a concept to manage complex systems, especially in technological design, modularity refers to the "decomposition" of a given system by grouping its elements into a smaller number of subsystems or "modules" whose elements are strongly connected among themselves and relatively weakly connected to elements in other units.[1] Put in this way, the concept of modularity contains the idea of interdependence within and relative independence across modules.[2] This principle of modularity has been applied with great success to technological systems. In two subparts we will show how modularity shapes the basic devices of the Information Society: the computer and the Internet. Both are perceived as complex systems which build on vertically related networks. The Internet is looked at as a modularized communication network based on physical connection, while the computer is composed of compatible modules which often adhere to common standards constituting virtual networks. Perhaps the most important result of the implementation of the principle of modularity in these systems was that the functionality of an application was separated from direct control over any physical infrastructure (hardware or transmission grids) necessary to perform the application (e.g., the rise of operating systems for computers, and the introduction of standard Internet protocols). This evolutionary gain provided for a relatively independent exploration of (social and technological) possibilities on each vertical level of modularity (layer) within the system.

Part III concerns the digitalization of information. One consequence of this digitalization is that information is "homologized": every type of information can be resolved into a number string consisting of different permutations of one and the same two digits as basic units. This has important effects on the relation

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1 The idea of decomposability in modular design can be found in HERBERT A. SIMON, *The Architecture of Complexity*, *in* 106 PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY 467, 474-75 (1962).

2 For a description of the concept of modularity, see CARLISS Y. BALDWIN & KIM B. CLARK, *Design Rules*, *in* THE POWER OF MODULARITY 63-64 (2000).

between information and its protection. Traditionally, copyrightable content was structurally distinct from the means of its protection: the right was distinct from its enforcement. But now DRM systems are building on the structural identity of "protected information" and "protecting information" in the digital environment; they merge content and protection. In providing for right enforcement mechanisms independent from the State, DRM systems present the possibility of a privatization of the law – a phenomenon below described as "juridical particularism." This notion does not describe, in this context, a tendency to an imposition that may be undertaken by private parties through meta-legal constraints, but refers to the (inevitable and not necessarily negative) shifting of the legal system to more complex and unsystematic relations between private will and public sovereignty, between who creates the legal constraint and who enforces it.

II. MODULARIZATION IN INFORMATION SYSTEMS AND ACCESS TO NETWORKS

A. OVERVIEW

Networks are becoming more and more important as society transforms into an information society. In fact, networks, together with the digitalization of information which provides for their "homologization," are the constituent factors of this development.[3]

This increased importance pertains to both types of the presently described networks, actual networks and virtual networks.[4] Actual networks - with communication networks as the most relevant with respect to information – are built on physical interconnection in order to enable the transmission of information. Virtual networks, by contrast, are solely constituted by positive feedback effects of horizontal and vertical compatibility around common standards. In a "virtual network" participants are linked together by complementarity

3 For the idea of "homoligization" of information, see James Boyle, *A Politics of Intellectual Property*, 47 DUKE L.J. 87, 91 (1997).

4 This distinction is used by antitrust scholars to indicate that network effects are not confined to cases of communication between users on the network. *See* Michael L. Katz & Carl Shapiro, *Antitrust in Software Markets*, *in* COMPETITION, INNOVATION AND THE MICROSOFT MONOPOLY: ANTITRUST IN THE DIGITAL MARKETPLACE 29, 32 (Jeffrey A. Eisenach & Thomas M. Lenard eds., 1998); Daniel L. Rubinfeld, *Antitrust Enforcement in Dynamic Network Industries*, 43 ANTITRUST BULL. 859, 861 (1998).

of products and adherence to common technological standards, rather than by physical interconnection.[5]

From a legal perspective, the problems with networks often concern competitors seeking access. Therefore, the law of antitrust has some familiarity with the phenomenon of networks, but in the past the law has just perceived the horizontal dimension of networks. Somehow neglected in the discussion is the vertical dimension. Yet it seems that we have to take into account this perspective if we want to determine the proper governance rules for networks in accordance with their social functions, whether these are the explicit rules enacted by the legislator or the rules found by courts from case to case. Why should a vertical perspective on networks matter?

Both types of networks appear as parts of modularized complex systems. Most important, "the Internet" and "the computer" can be looked at as such complex systems. "Modularization", grossly speaking, is the splitting up of a system into different interoperable layers of technology, often – but not necessarily – accompanied by a shift of functionality to the "end" of the system.[6] The consequence of this is that the "higher" located, directly applicative parts can be designed with fewer constraints, allowing for more sophisticated applications. On the other hand, what is in fact possible is framed by the architecture of the underlying, "lower" level. Lower level architectures determine the field of possibilities in higher levels.

In the constitution of these levels or layers of the two modularized systems – the Internet and the computer - networks are playing a central role, especially when they function as platforms other, "higher," layers of the system are built on. In this case one might speak of "information platforms"[7] or "systems technology."[8]

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5 *See* Richard N. Langlois, *Technology Standards, Innovation, and Essential Facilities: Toward a Schumpeterian Post-Chicago Approach*, *in* DYNAMIC COMPETITION AND PUBLIC POLICY 193, 195 (Jerry Ellig, ed., 2001).

6 We will use both expressions, depending on which feature we wish to highlight. The language of "platforms" has the advantage of indicating that there are information applications built on top of them which essentially rely on the underlying facility/technology. The language of "systems technology" indicates that technological modules constitute a "whole" in their interplay and thus are ultimately parts of an integrated system.

7 Philip J. Weiser, *Networks Unplugged: Towards a Model of Compatibility Regulation Between Information Platforms* (2001) (paper presented at the 29th Annual Telecommunications Policy Research Conference), *available at* http://arxiv.org/html/cs.CY/0109070 [hereinafter Weiser, *Networks Unplugged*] which is an earlier version of Weiser, The Internet, Innovation, and Intellectual Property Policy, 103 Colum. L. Rev. 534 (2003)), p. 4, uses the term "to refer to any standard for an information product that other companies rely on to supply a complementary product", noting that "in most cases, that complementary product

This Article will focus on the cable network as a platform for broadband Internet (II.3) and on "virtual" networks in the industry for computer technology (II.4). It will examine how their function as platforms for applications relying on them – their vertical function - is affecting the governance of these platforms. In other words, an extension of the perspective into the vertical dimension enables the law to assess the role of networks in the relationship of information infra- and superstructures.

It will show that under certain circumstances the law might require access to network property to take account of its function as information infrastructure. With this form of legal assistance each layer in a modularized system may be able to evolve free from constraints by adjacent layers, realizing the evolutionary gains attached to greater variation. Ultimately, it becomes visible that institutional design and network governance in the given examples are linked to technological architecture.

The argument in this Part will start with the observation that the evolution of the two complex systems – the Internet and the computer - was positively influenced when functionality was freed from control of the infrastructures or platforms. This was the moment in which modularity could unfold. In both sectors this conscious realization of modularity happened in historically contingent ways. In the telecommunications industry it was the result of a public policy decision whereby AT&T was urged by agencies to allow the attachment of foreign devices to the network. Whereas in the computer industry, it evolved from supplying integrated proprietary systems to a modular industry open to specialization and entry at different layers due to a management decision rewarded by the selection mechanism of the market.[9]

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will be an application or peripheral", but that in addition to this vertical compatibility of complementary products there is also a dimension of horizontal compatibility of "rival information platforms". *See also* Weiser, *Law and Information Platforms*, 1 J. TELECOMM. & HIGH TECH. L. 1, 3 (2002).

8 Dana R. Wagner, *The Keepers of the Gates: Intellectual Property, Antitrust, and the Regulatory Implications of Systems Technology*, 51 HASTINGS L.J. 1073, 1081 (2000), uses this term specifically to denote technology that defines and governs the computing environments within which people operate; it comprises both the hardware (e.g., bus design or input/output interfaces) and the software (operating systems, browsers) that define the parameters of the computing environment - the "meta-technology" that frames the system.

9 On the transformation of the computer industry, see Joseph Farrell & Philip J. Weiser, *Modularity, Vertical Integration, and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age*, 17 HARV. J.L. & TECH. 85, 92-93 (2003).

Due to this modularization, function can now be placed freely within the system. Consequently, each layer of functionality is potentially open to new entrants which specialize in further developing the components of the system. A more rapid improvement of these parts is possible because innovation is now vested in many hands and in a variety of layers.

But the danger in modularized systems – in the ones discussed here but also in general - is that the control of one layer of the system is leveraged onto an adjacent layer; that control of the infrastructure is extended to the superstructure. This is highlighted by the fact that the architecture of a platform is a decisive parameter for the possibilities of an "application".

This danger of "leveraging" is directly addressed by antitrust law. Therefore, antitrust is of special importance in modularized or layered complex systems. This makes sense as antitrust operates with the general or default assumption that the market is best in coordinating decentralized and dispersed knowledge and that intervention is necessary only when the very conditions for the operation of the market itself are distorted by too much power, i.e. control, in the hands of single players. The law provides a kind of assistance to the evolutionary process by permitting each layer to autonomously explore the range of its possibilities and its own mix of openness and closure. This assistance is kept to a minimum because the standard for triggering antitrust intervention is quite high. It will only intervene when it is necessary; but then it should do so without compromise.

The way antitrust intervenes is by enforcing access to platform networks. Access, as construed in this paper, is a functional principle. Its means differ according to the goals. In communication networks, access means granting third parties the right to interconnect with and to transmit through the given network. In virtual networks, access means granting third parties the right to interoperate, that is to have as much information about the standard platform as is necessary to build a compatible product.

The actual justification for mandating access is the same in both types of networks and lies in the essential dependence of the superstructure on the infrastructure. This becomes a problem when inter-platform competition is not working properly. In physical communication networks this is often the initial situation, because there are natural monopolies in the distribution infrastructure whose replication would make no sense. In virtual networks, the need for access occurs after the shift from inter-platform competition to intra-platform competition (e.g., because of the emergence of a dominant

standard), and when the holder of this standard is not behaving in accordance with the duties adhering to its monopoly position.[10]

B. GOVERNANCE OF INFORMATION RESOURCES: ACCESS

As indicated, when we look at networks in the context of modularized systems we are shifting the focus to the specific interdependencies a given network has with the other modules or layers of the system. Certainly, this involves considering the function each module has within the operational design of the system (e.g. as a platform for running higher applications). On the other hand, it would be a shortcoming to conceive of these layers only as operative parts of an individual system. The concrete technological device is the result of the complex interaction of social processes. It depends on the competitive structure of the industry and on successful R&D activity which in turn depends on the parameters of the innovation environment. Hence, when we look at the different layers of the system we ask how the circumstances in one layer can affect the evolution of another layer – with "layer" understood as a subset of societal processes. Each layer represents a field of possibilities for technological innovation or communication.

If we want to assess the appropriate policy for governing networks in such contexts, we may ask how the authority to use such networks is affected when they operate as a resource other processes rely on. Principally, this authority resides in the owner.[11] But in cases of property in information resources, some modifications may apply because of its important social function.

Insofar as a proprietary resource is a resource for communication, the rules applying to property are to be adapted to the rules pertaining to information. The right to control the property is itself subject to control. This is because such property is used for a special function and this function embodies an important value for both the individual and society as a whole, as acknowledged especially by the Constitution.

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10 To be clear about this, the IP right which protects the technology of the standard does not confer a monopoly to its holder. He will often gain his position as a monopolist because and when his standard becomes dominant.

11 *See* ARMEN ALCHIAN, *Some Economics of Property Rights*, *in* ECONOMIC FORCES AT WORK 130 (1977) (defining the creation of property rights as a method of assigning to particular individuals the "authority" to select, for specific goods, any use from a nonprohibited class of uses).

For example, as far as the property rights in communication networks are concerned, there is a history of compromises between those who control such networks and seek to profit from this control, and those who want to communicate and seek access to these networks.[12] Unlike most economic sectors where marketplace competition is the mechanism chosen to negotiate compromises, communication policy is a sector where the State traditionally has not trusted markets fully to settle such arrangements, for two main reasons.

First, the particular economics of communication networks entail risks of runaway control. Features such as network externalities and increasing returns often reinforce the power of those who control a network, driving toward natural monopoly. Unchecked, this can lead to pricing abuses, arbitrary exclusion and censorship.[13] Second, the democratic state considers access to communication a fundamental right, a prerequisite of thriving democratic society. Freedom of communication is at the heart of political liberty, but political liberty is not identical with economic liberty. The relation between these two kinds of liberty in the democratic state has been the subject of an ongoing discussion since the time of the French Revolution,[14] and

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12 François Bar & Christian Sandvig, *Rules from Truth: Post-Convergence Policy for Access* 4 (Sept. 2000), *available at* http://www-rcf.usc.edu/~fbar/Publications/Rules_from_Truth.pdf (defining "network control" as the ability to determine network layout, architecture, configuration, applications, price structure, and access conditions).

13 *Id.*

14 JÜRGEN HABERMAS, BETWEEN FACTS AND NORMS: CONTRIBUTIONS TO A DISCOURSE THEORY OF LAW AND DEMOCRACY 408 (William Rehg trans., 1996), for example, assumes an internal relation between private and political autonomy. He explains this in terms of a community's self-organization by a system of rights:

> Under Postmetaphysical conditions, the only legitimate law is one that emerges from the discursive opinion-and-will formation of equally enfranchised citizens. The latter can in turn adequately exercise their public autonomy, guaranteed by rights of communication and participation, only insofar as their private autonomy is guaranteed. A well-secured private autonomy helps 'secure the conditions' of public autonomy just as much as, conversely, the appropriate exercise of public autonomy helps 'secure the conditions' of private autonomy. . . . This is because legitimate law reproduces itself only in the forms of a constitutionally regulated circulation of power, which should be nourished by the communications of an unsubverted public sphere rooted in the core private spheres of an undisturbed lifeworld via the networks of civil society.

there are good arguments why modern democratic society should not let economic logic entirely determine access to the public sphere.[15]

Similarly, intellectual property - which is directly related to the innovation process - is subject to peculiar impositions. This parallel is not by chance. As the process of innovation relies heavily on information and its production in the communicative process, the former may indeed be seen as a part of latter. Be that as it. What matters here, is that also in this case – viz. under the specific perspective of progress - property, because of its specific function for an important social process, is governed by special rules reflecting its social function. This becomes particularly manifest in the "functional idea of intellectual property" in the United States.[16] Here, intellectual property rights are designed as state granted exclusive rights conferred in order to produce present and future public benefit.[17] For the purpose of achieving these goals, the "limitations" on the right are regarded as just as important as the grant of the right itself with the consequence that "intellectual property is a particularly inappropriate area to talk about property rights as if they were both natural and absolute."[18] This idea of "conditioning" property, early expressed by Jefferson,[19] is enshrined in Article I, Section 8, Clause 8 of the Constitution. Uncharacteristically for Article I, this clause devotes much of its text not to granting power, but to delimiting it functionally, both directly ("To promote the Progress of Science and useful Arts") and indirectly by a temporal limitation ("by securing for limited Times to Authors and Inventors").[20] By doing so, the Exclusive Rights Clause operates

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15 A classic text is JOHN S. MILL, ON LIBERTY (1859), which strongly insists on a robust, diverse public discourse, warning not only against distortion of this sphere by governmental action but also against the dangers posed by dominating social forces.

16 Boyle, *supra* note 3, at 106.

17 *See* Sony Corporation of America v. Universal City Studios, Inc., 464 U.S. 417, 429 (1984) (describing that Congress "has been assigned the task of defining the scope of the limited monopoly that should be granted to authors or to inventors in order to give the public appropriate access to their work product," and stressing that the rights under Article I § 8 "are neither unlimited nor primarily designed to provide a special private benefit"); *see also* Eldred v. Ashcroft, 537 U.S. 186, 245 (2003) (Breyer, J., dissenting) (underlining that the "reward" granted by the Constitution "is a means, not an end").

18 *See* Boyle, *supra* note 3, at 106.

19 "Inventions then cannot, in nature, be a subject of property. Society may give an exclusive right to the profits arising from them, as an encouragement to men to pursue ideas which may produce utility, but this may or may not be done, according to the will and convenience of the society, without claim or complaint from anybody." Letter from Thomas Jefferson to Isaac McPherson (Aug. 13, 1813) (quoted in *Graham v. John Deere Co.*, 383 U.S. 1, 8 (1966)), *available at* http://www.temple.edu/lawschool/dPost/mcphersonletter.html.

20 The question of temporal limitation recently arose in *Eldred v. Ashcroft*, 537 U.S. 186 (2003).

as a first threshold filter on congressional attempts to create exclusive private rights in information. It is complemented by the filter of the First Amendment, which operates as a second level of scrutiny.[21]

As can be inferred from this short comparison, the realization of the mentioned special social function of such property as is important for communication and innovation depends heavily on a guarantee of access to this property. "Open access" is a crucial element of policy in both the regulation of information infrastructure and intellectual property. Construed as a material principle, "access" can crystallize in different forms like open standards or compatibility.

Questions of open standards and compatibility have become increasingly important during recent years because of the growing implementation of the idea of modularization in technology. This design principle has various facets. Its most interesting feature may be that it separates the functionality of an application from direct control over the hardware necessary to perform the application.[22] But the maneuver of modularization can only work when the involved elements are interoperable. Modularization requires as a corollary principle interoperability. As a consequence, technology, or rather, technological design principles, are partly embodied in and rely on a material open access principle.

It seems worthwhile to note that technological design here relies on implementations of the same principle – open access – as is applied in the law in order to guarantee certain social functions of property (communication, progress).

A functional analysis of property in information platforms recommends a rigid implementation of an open access principle. Access under this analysis is not an absolute standard with fixed requirements. It depends not only on the type of information platform, but also has to be shaped in accordance with the peculiar circumstances of each case. Access can be granted to physical facilities as well as intangible information, the timing of access may play a role, and there may be restrictions on the number of those eligible for access. Forming part of the broader functional analysis of property, the access principle is also interpreted functionally. Take, for example, the question of access to systems technology in high-tech industry. Here, a company can be said to have access to a technology if it can manufacture commercially viable products that incorporate or are

21 *See* Yochai Benkler, *The Public Domain: Through the Looking Glass: Alice and the Constitutional Foundations of the Public Domain*, 66 LAW & CONTEMP. PROBS. 173, 176-80 (2003).

22 It may be said that functionality is freed from physical limitations.

compatible with that technology.[23] Under a functional concept of access the ways of achieving this goal of compatibility are not preset; they must be construed with respect to the applicable access standard. The determination of an appropriate standard in turn depends on the type of platform (part of a communication or a virtual network?), and also on the layer level of the platform in a modularized system,[24] to mention just two factors.

C. ACCESS TO THE CABLE PLATFORM FOR BROADBAND INTERNET

At present, we are experiencing the formation of a third Internet generation. The first-generation Internet (late 1960s to early 1990s) consisted in a network prototype of interest to military and research organizations, and the second generation (from the early 1990s) saw the mass adoption and commercialization of narrowband access. Third-generation Internet offers always-on broadband access from private homes.

As the race to win subscribers for broadband technologies has just begun, there are two major competing technologies offering consumers broadband access to the Internet: digital subscriber lines (DSL) and cable modems. They use the two data pipes currently connected to most homes. DSL uses copper telephone circuits to transmit a high-bandwidth digital signal; cable modems uses the cable television line.

Thus, the Internet is starting to expand beyond the traditional telephone network into the cable network.[25] This type of network had not been part of former Internet generations. It retained a broadcast model in which ownership of the physical network itself had been the key to programming control and profits. As cable moves from "broadcast" to "broadband", there is an important policy choice to be made: should the open access requirements developed in the telecom world for previous generation Internet be extended to the new cable broadband access infrastructure, or can competition among third-

23 *See* Wagner, *supra* note 8, at 1091.

24 *See, e.g.*, Mark A. Lemley, *Intellectual Property Rights and Standard-Setting Organizations*, 90 CAL. L. REV. 1889, 1902 n. 40 (2002) (stating that there is a reasonable argument for open platforms at the lower or infrastructure layers even if the higher software and content layers are proprietary).

25 Admittedly, the case can also be restated: the cable industry discovered the Internet as a new application. From an antitrust perspective this might even be the crucial point because it indicates that a given industry, operating in a given market, is expanding into a different area with its own market structure.

generation access networks serve as a substitute for open access and continue to sustain wide-ranging innovation we experienced in the earlier generations of the Internet?[26]

1. THE POLICY FRAME

(a) PRESENT REGULATION AND FUTURE OPTIONS

Currently, the regulation of the provision of broadband Internet access service is asymmetric. Telephone companies are required to provide access to competing DSL providers on an open access and nondiscriminatory basis. Incumbent local exchange carriers (ILEC), who own the most significant portion of the local telephone network, face the obligation to offer competitors the use of their network on a wholesale (or, "unbundled") basis so that they may offer, in the retail market, DSL services that compete with the ILEC's own retail offering to customers. In contrast, a cable television operator is not regulated in its sale of cable modem service. Most importantly, there is no general provision which would prevent cable companies from bundling cable modem service with Internet service provider (ISP) service.[27]

This situation of asymmetric regulation does not appear to be the outcome of a deliberately chosen policy, but rather the consequence of new technology "growing" into traditional regulatory regimes organized around the different types of communication service. As is generally observed in the regulation of the media, certain policy goals were embodied in specific, technologically-dependent rules and once this initial policy regime was chosen it persisted.[28] The result is a significant path-dependency in media services regulatory

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26 Francois Bar et al., *The Open Access Principle: Cable Access as a Case Study for the Next Generation Internet 2*, *in* THE ECONOMICS OF QUALITY OF SERVICE IN NETWORKED MARKETS (Lee W. Knight & John Wroclawski, eds.) (forthcoming), *available at* http://www-rcf.usc.edu/~fbar/Drafts/OpenAccess-MITPress.pdf.

27 But note the conditions on which the FTC approved the merger between Time Warner and AOL. *See infra* II.C.1.c.

28 Bar & Sandvig, *supra* note 12, at 16. One example is the television broadcast regime. Under *Red Lion Broadcasting Co. v. FCC*, 395 U.S. 367 (1969), a scarcity rationale justifies a regime of licensing and content regulation for broadcast spectrum on the grounds that a property rights and free-market model are unworkable. But due to technological change (media convergence) and privatization of spectrum (spectrum is increasingly recognized as a property right that is auctioned off to the highest bidder) this is no longer convincing. *See* Philip J. Weiser, *Promoting Informed Deliberation and a First Amendment Doctrine for a Digital Age: Toward a New Regulatory Regime for Broadcast Regulation*, *in* DELIBERATION, DEMOCRACY, AND THE MEDIA 11-19 (Simone Chambers & Anne Costain eds., 2000).

regimes. This separate media governance is called into question by the current tendency towards media convergence, fueled by increasingly pervasive digital technologies which allow networks to carry virtually any type of information traffic.

The alternative to this asymmetry is either symmetric regulation or symmetric freedom from regulation. The latter would place trust in competition between cable companies themselves, and between different platforms.[29] In contrast, the argument for symmetric regulation recommends imposing an open access regime on cable similar to that for the telephone network.[30]

(b) CONCERNS

(1) The opponents of open access requirements argue that market forces will bring cable operators to open their networks because it is in their interest to maximize the amount and diversity of content available to their subscribers.[31] They claim that cable platforms for broadband Internet are generating indirect externalities (consumers' demand for hardware goods is positively influenced by the variety of software goods that are compatible with the hardware) and in this respect differ from telecommunications networks which generate direct externalities. Most residential purchasers of broadband Internet access would not buy a higher speed connection solely for the purpose of sending and receiving information at higher speeds. Rather, such access is merely a component of the overall package of goods consumers are purchasing (Internet access, video on demand, news services, etc.). In this sense, broadband Internet access and the related information services are hardware and software goods respectively. As "producers" of a hardware good, the cable companies have an incentive not to restrict the market for information services or the availability of those services to its subscribers even if it had a monopoly in the provision of broadband access, for the consumer would respond by anticipating possible "lock-in" situations and choose a broadband access provider which makes a comparatively wider

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29 James B. Speta, *Handicapping the Race for the Last Mile?: A Critique of Open Access Rules for Broadband Platforms*, 17 YALE J. REG. 39 (2000); Weiser, *Networks Unplugged*, *supra* note 7; *see also* Robert W. Crandall, Hal J. Singer & J. Gregory Sidak, *The Empirical Case Against Asymmetric Regulation of Broadband Internet Access*, 17 BERKELEY TECH. L.J. 953, 984 (2002) (arguing that there is no economic justification for regulating the ILECs' broadband services and that the FCC should forebear from further regulation).

30 See *supra* note 26; MARK COOPER, CABLE MERGERS AND MONOPOLIES (2002); Mark A. Lemley & Lawrence Lessig, *The End of End-to-End: Preserving the Architecture of the Internet in the Broadband Era*, 48 UCLA L. REV. 925 (2001).

31 *See* Speta, *supra* note 29, at 82-88.

variety of information services available than others – just as consumers are more likely to buy the operating system compatible with a wider variety of application programs.

Moreover, it is argued that cable modems face sufficient competition from other facilities-based broadband platforms like telephone lines (DSL), wireless, and satellite.[32] So if the cable companies do not permit a variety of ISPs, they will simply be driven out of the market for broadband access by other companies that do. In addition to the intra-platform competition between different cable companies offering Internet access there would therefore be a competition among different platforms, i.e. inter-platform competition.[33]

Other objections highlight the fact that an open access regime will require regulators to set a price for wholesale access because, unlike other tying arrangements where the tied product is sold separately at a market price, there is no market for the relevant broadband transport.[34] Finally, regulatory oversight of the pricing and technical arrangements for accessing cable facilities would not only generate significant costs of regulation[35] but also impact the incentives for, and the process of, innovation.[36]

(2) In contrast, proponents of open access regimes see no justification for treating cable modems any differently than telephone networks. They are mainly concerned about the danger of cable companies leveraging their control over cable lines into control over adjacent markets.

For example, one type of market that would be affected is the market for ISPs. In this case cable companies could dictate the consumer's choice among ISPs, and thereby eliminate competition among ISPs in the broadband market. As a consequence, not only would prices increase and innovation be stifled, but an important architectural principle of the Internet, the "end-to-end" design, would also be compromised.[37]

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32 *See* CABLE SERVICES BUREAU, FEDERAL COMMUNICATIONS COMMISSION, BROADBAND TODAY 43 (1999), *available at* http://www.fcc.gov/Bureaus/Cable/Reports/broadbandtoday.pdf; Weiser, *Networks Unplugged*, *supra* note 7, at 29.

33 A distinction between inter-system and intra-system competition is made in the case of system products by Langlois, *supra* note 5, at 210. For a view of the Internet as a giant systems product, see *infra* p. 32.

34 *See* Weiser, *Networks Unplugged*, *supra* note 7, at 30.

35 *See* Speta, *supra* note 29, at 85.

36 *See* Weiser, *Networks Unplugged*, *supra* note 7, at 30.

37 *See* Lemley & Lessig, *supra* note 30, at 928.

The fear is that cable operators might move into the communications and Internet services markets, bringing along their anticompetitive business model that relies on closed and restricted access to the consumer. Their claim that high-speed Internet access is just a cable service is seen as an effort to keep their networks closed and to operate them on a proprietary basis, thereby extending their anticompetitive business model from their previous core market, the video market, into the new "product space."[38]

The key to achieve this "leveraging" strategy of the cable operators would be their power to control access facilities. They are able to use "first mile" pipeline control in order to deny consumers direct access to, and thus a real choice among, the content and services offered by independent providers. The concerns over this advantage, together with the assumed export of the proprietary business model, fuel the assumption that vertically integrated broadband providers seek to engage in conduit discrimination against alternative transmission media as well as in content discrimination against alternative content suppliers.

Content discrimination involves an integrated provider insulating its own affiliated content from competition by blocking or degrading the quality of outside content. By denying unaffiliated content providers critical operation scale and insulating affiliated content providers from competition, this type of discrimination would benefit the cable provider by enhancing the position of its affiliated providers. Thus, the vertically integrated content provider could earn extra revenues from its own portal customers who would have fewer opportunities to interact with competing outside content.[39]

Conduit discrimination would occur if the vertically integrated company refused to distribute its affiliated content over competing transmission media. By doing so, such a company drives consumers to its own transmission media and weakens its rival. Concerns of this kind became relevant in the AOL/Time Warner merger. The fear of the telephone companies was that once AOL became a cable owner it would abandon the DSL distribution channel. Such an action following the switch of AOL to cable-based broadband had the

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38 *See* Cooper, *supra* note 30, at 74.

39 *See* Cooper, *supra* note 30, at 80-81 (pointing to tactics that a vertically integrated broadband provider could use to put competing, unaffiliated content providers at a disadvantage). First, it can give preference to an affiliated content provider by caching its content locally so that affiliated content can be delivered at faster speed than unaffiliated content. Second, it can limit the duration of streaming videos of broadcast quality to such an extent that they can never compete against cable programming. Third, a vertically integrated firm as such can impose proprietary standards that would render unaffiliated content useless.

potential to undermine the hoped-for competition between cable modems and DSL.[40]

Further concerns are raised by the consideration that cable facility owners can build their leveraging strategies on a lock-in of consumers. High speed-access to the Internet is a unique product. As the Department of Justice determined, the broadband Internet market is a separate and distinct market from the narrowband market. Moreover, there are significant switching costs in competing high-speed Internet access platforms.[41] Once a consumer has decided for one, he is unlikely to switch the supplier. This constitutes a substantial barrier to competition.

In sum, the concern on the side of the open access proponents is that the cable network's owners have the ability and incentive "to leverage network ownership into market power over network uses."[42] They are worried that a resurrection of the "old economy" model of facilities-based competition will take place in which the decision about which content gets to the public is left to the cable operator-ISP relationships that are developing in the marketplace. To allow cable facilities owners to use their market power to squeeze out unaffiliated ISPs is tantamount to giving up the model hitherto operating the Internet, namely to profit from competition among thousands of ISPs competing for customers.[43] This would not just reduce consumer choice, as the danger of discrimination implies. It would, and this is the more basic argument, return to a logic of communications platforms in which it is assumed that the center of value creation resides in the physical layer.

In the terms of this paper, the physical layer would be determinant of the architecture of higher layers (in case of the Internet, the code and content layer). The progress attached to modularization would be in danger of being reversed. The "freed" higher application layers would "freeze" again and become subject to control by the owner of the lower, physical layer. This would be no mere

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40 The FTC therefore required AOL to continue to make its service available over the DSL conduit. *See* Cooper, *supra* note 30, at 82-83.

41 *See supra* note 26, at 9. Different requirements for inside wiring, different terminal equipment, non-refundable connection charges, different computer set-ups are among the factors of the hardware cost of switching between cable and DSL.

42 *See supra* note 26, at 2.

43 This is indeed what the cable industry deems to be an outmoded model because "an environment preserving thousands of small ISPs may be unnecessary to ensure responsive consumer service, technological advancements, and innovative content." Cooper, *supra* note 30, at 76 (citation omitted).

technological backlash, but also would undermine the values allegedly embedded in technological architectures.

(c) THE AOL/TIME WARNER MERGER

An interesting case study is the merger between AOL and Time Warner, because it involved a vertical combination of the largest Internet content provider and aggregator with one of the largest cable systems operators. One of the main concerns was that the merged firm might utilize its market power in one market to foreclose competition in vertically related markets. Antitrust analysis applying econometric methods suggested that, absent suitable remedies, the merger would create strong incentives for the merged firm, AOL-TimeWarner, to discriminate against both unaffiliated conduits and other content providers.[44]

The consent decree finally ordered by the FTC consisted of three main access provisions: First, AOL was required to provide Earthlink[45] effective access over Time Warner cables before AOL itself could begin offering its service in major markets.[46] In addition, it required that, within ninety days of AOL's service debut on Time Warner lines, two other ISPs must be given effective access within major urban areas.[47] Second, applying a "most favored nation" clause, Time Warner was forbidden from striking a deal with another Internet provider with less favorable rates and terms than those in the Earthlink agreement, or any other accord that AOL negotiated to carry its content on other cable systems.[48] Third, the agreement adopted measures to ensure that the merged firm would not favor its cable Internet access service over its service for DSL subscribers.[49] To assure compliance with these regulations, the FTC appointed a "monitor trustee" who would continously monitor AOL-Time Warner's performance and report to the FTC. In sum, the FTC has taken on the job of regulating the merged firm's open access going forward.

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44 *See* Daniel L. Rubinfeld & Hal J. Singer, *Open Access to Broadband Networks: A Case Study of the AOL-Time Warner Merger*, 16 BERKELEY TECH. L.J. 631 (2001).

45 Earthlink is the second-largest ISP in the United States after AOL and it had signed a contract with Time Warner prior to the FTC approval of the merger.

46 *See* Federal Trade Commission, Consent Agreement, *In re America Online Inc. and Time Warner Inc.*, 65 Fed. Reg. 79861, II.A.1 (Dec. 20, 2000), *available at* http://www.ftc.gov/os/2000/12/aoldando.pdf.

47 *Id.* at II.A.2.

48 *Id.* at II.C.1.

49 *Id.* at IV.A.

This remedy addressed some of the previously mentioned concerns. The first and second provisions eased the worries of antitrust scholars about content discrimination. Even if the merged company elects to block all outside content, unaffiliated portals and content providers can still reach cable customers through a competing ISP. Thus, customers seeking access to foreclosed content will not have to switch to another transport conduit with a lower rate of market penetration.[50] Scholars were optimistic that the third provision would hinder conduit discrimination by the combined firm. Even if the combined company elects to distribute its service only through cable modems, competing, unintegrated portals can still take advantage of cable's dominant position in the broadband transport market, leaving competing conduit providers with enough content to justify continued investment.[51]

Nevertheless, the consent decree did not convince all of the access advocates. Access proponents with a broader vision than antitrust scholars pointed to the fact that the FTC had created a kind of "limited access" regime which falls short of the "open access" model of the telephone network. These critics regard the adopted measures merely as a policy experiment which may or may not work out with respect to the innovation dynamics this limited approach sets up for the third generation Internet.[52] The task, then, is to "watch the watchmen," and monitor the policy experiment of the regulatory agency itself. Two shortcomings of the decree could provide guidance for this second-level monitoring:[53]

First, the decree still limits the number of ISPs likely to operate on the Time Warner network and entrusts the cable owner with the selection of the few ISPs that will be allowed alongside AOL. Hence, AOL can favor ISPs that share its vision for the architecture of the third generation Internet, and it can avoid ISPs whose strategy directly challenge its own. In contrast, incumbent telecommunications companies are explicitly denied such discretion as to who gets access to their networks.

Second, the "limited access" policy regime assumes that ISPs constitute an adequate proxy for other network users and will explore the full range of possible network applications. Again with regard to the situation in the telephone network this seems far from obvious. There, open access does not simply mean that non-affiliated ISPs can get access on equal terms with the telecom-affiliated ISP, but that any

50 *See supra* note 44, at 674.
51 *See supra* note 44, at 675.
52 *See supra* note 26, at 3, 21.
53 *See supra* note 26, at 22.

network user can get access to unbundled network elements, thus creating conditions for much broader exploration of network uses.

What was achieved then in the course of the AOL/Time Warner merger was the drafting of an access policy limited to dealing with the possible adverse effects on competition in the markets for Internet service provision and limited to the partners in this particular merger. No parallel conditions exist for other cable networks (e.g., AT&T's). Nor will every open access issue result in a merger review. There was no comprehensive approach created for resolving the current collision of two policy legacies: cable's monopoly and restricted access origins, and the open access thrust of telecommunication policy that ushered in user-driven innovation and the Internet revolution.[54] In particular, the more generic problem that a closed architecture of the lower layer cable broadband could also restrict the architectures on higher layers and their "network performance features" such as "end-to-end," which are deemed to be vital to innovation and other social values, was left unaddressed. It is on these values which are allegedly embedded in technology that a functional analysis of property in information platforms has to turn.

2. A FUNCTIONAL ANALYSIS

As explained above, the control of property depends on its function. A cable network can perform different functions. It can be operated as a device to distribute multi-channel video programs. It can also be used for advanced telecommunications, supplying broadband cable modem service.[55]

According to the assumptions stated at the outset of this paper the new use to which the cable grid is being put – namely to operate as a (physical) platform for the Internet as a modularized or layered network – requires a review of the rules for property rights in cable facilities. The changed function of the property – from a one-way passive carrier of video signals to a platform for a modularized communication medium – might make necessary new rules of governance. In order to assess the platform function of the cable facilities the characteristics of the structure of the Internet cannot be left unattended.

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54 *Id.* at 23.

55 In fact, cable companies use the same technology to provide both video and telecommunications services. The upgrades necessary to provide the current generation of digital video service also make possible the provision of high-speed Internet service, and cable companies have bundled the two services together. *See* Cooper, *supra* note 30, at 1.

The Internet is a system of communication between autonomous individuals. It represents "a unique and wholly new medium of worldwide human communication," as the Supreme Court found in *Reno v. ACLU*,[56] or, in the words of another court, a "never-ending worldwide conversation."[57]

While resting on a platform, at the same time the Internet itself is a platform for dynamic markets and a huge number of innovations. Through the peer-to-peer exchange of information it enabled at the same time a vast cultural production and new ways of democratic participation. It enabled the end points to become "users" who can play the roles of consumer *and* producer – as opposed to the traditional conception of an information environment composed of a small number of professional producers and a large number of passive consumers. The acts of reception of these users are dialogic in the sense that they can easily be mapped as moves in a conversation rather than as endpoints for the delivery of a product.[58]

Thus, the Internet is a communication medium of both great economic and social value. It has opened a forum for human activity in an extensive sense, allowing for interaction in terms of both instrumentalistic *and* discoursive logic.

(a) THE ARCHITECTURE OF THE INTERNET

Technologically, the Internet is construed as a network of networks.[59] This super-network has a certain historical structure. It has been argued that it is precisely this contingent architecture which enables the great innovations related to the Internet and which lies at the basis of its great economic importance.[60]

The peculiar mode of interaction enabled by the Internet rests on a special design of the communication infrastructure. This architecture in turn can be viewed as the realization of two principles: network modularization and end-to-end design.

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56 Reno v. ACLU, 521 U.S. 844, 850 (1997).

57 ACLU v. Reno, 929 F. Supp. 824, 883 (E.D. Pa. 1996).

58 *See* Yochai Benkler, *VIACOM-CBS Merger: From Consumers to Users*, 52 FED. COMM. L.J. 561, 564 (2000).

59 *See* Kevin Werbach, *Digital Tornado: The Internet and Telecommunications Policy*, 29 OPP Working Paper Series 10-12, 17 (1997), *available at* http://www.fcc.gov/Bureaus/OPP/working_papers/oppwp29.pdf.

60 This is one of the central arguments in LAWRENCE LESSIG, THE FUTURE OF IDEAS (2001).

i. NETWORK MODULARIZATION

To describe the structure of the Internet it is helpful to use a model that distinguishes several vertical layers.[61]

Various layered models have been proposed, each suited to the purposes of a particular description (engineering, regulating). The Open System Interconnect (OSI) model, developed in the 1980s by the International Standards Organization, is used by network developers and defines seven layers based on functionality.[62] However, discussing the policy for the Internet as a communications system, a three-layered model seems to be sufficient.[63] First, there is the physical layer: the computers, wires, cable, spectrum, or other real world media that actually carry data. Second, there is the logical or code layer. The code runs the hardware and enables content to move along the wires (like the TCP/IP protocols; the software upon which those protocols run; the domain name system (DNS)). Third, at the top there is the content layer: the data actually transmitted through the network.

This three layered model can be applied to other communications systems besides the Internet, but before digital networks came up there was no reason to do so.[64] In earlier networks, the management and routing functions that enable information flow were "hard-wired" in the specific arrangement of electro-mechanical devices that formed a particular communication network. The logical architecture of the network precisely reflected its physical architecture. One had to own the network to change the arrangement.

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61 Traditionally, communication policy has been organized around horizontal divisions between categories of service (wireline voice telephony, radio, television) and between geographic regions (interstate, intrastate). *See* Kevin Werbach, *A Layered Model for Internet Policy*, 1 J. TELECOMM. & HIGH TECH. L. 37, 39 (2002).

62 *See* Martin P. Clark, NETWORKS AND TELECOMMUNICATIONS: DESIGN AND OPERATION, 194-199 (2d ed. 1997).

63 *See* Benkler, *supra* note 58, at 562; Yochai Benkler, *Property, Commons, and the First Amendment: Towards a Core Common Infrastructure*, 50-82 (White Paper for the Brennan Center for Justice, 2001), *at* http://www.law.nyu.edu/benklery/WhitePaper.pdf (last visited Apr. 19, 2004); Lessig, *supra* note 60, at 23; Werbach, *supra* note 61, at 57-64 (distinguishing four layers by adding an applications layer); NATIONAL RESEARCH COUNCIL, REALIZING THE INFORMATION FUTURE: THE INTERNET AND BEYOND 47-65 (1994) (demonstrating that the Council also uses a four layered model).

64 Whether it makes sense to do this depends – as mentioned – on the type of discourse and on the type of the network examined. It is not to decide here whether "these three layers function together to define any particular communications system." *See supra* note 60, at 23.

The Internet, on the other hand, is a modularized network. Here, the platform configuration depends on the ability to program the network's control software. Control over network configuration thus becomes in principle separable from network ownership. Multiple network platforms (supporting a variety of communication patterns) can simultaneously co-exist on a single physical infrastructure.[65] In modularized systems the logical layer therefore becomes the key. This is where network configuration is defined, where interconnection between separate physical networks is made possible or prevented, and where co-existence of various service providers ("open access") is permitted or denied.[66]

The same technique is common in many areas of technological development. What was once a single piece of technology ("the computer") becomes an assemblage of different functional parts. For example, the operating system freed the application programmer from the task of directly controlling hardware. The whole gambit looks like another draw in the thriving process of differentiation. As once the division of labor led to great progress (and enormously enhanced productivity) by first splitting up the production process of single goods and then recombining the different elements faster and in a more sophisticated way, so too is modularization enabling the development of more complicated systems.

ii. END-TO-END (E2E)

This new found separability between a network's logical architecture and its physical layout has an important consequence. Now the placement of function within a network is not determined anymore. In a modularized network the technically correct level within the network to locate certain functionality can be argued about.

Exactly this discussion took place among system engineers in the 1980s. In a now-classic paper in network engineering, Saltzer, Reed, and Clark elaborated a design principle for computer systems called the "end-to-end principle".[67] Although the principle was known before, appearing along with the development of packet switching, the authors recognized that the emergence of the data communication network as a computer system component had sharpened this line of function placement argument. The principle basically states that

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65 *See supra* note 26, at 22.

66 *See supra* note 26, at 21-22.

67 *See* Jerome H. Saltzer et al., *End-to-End Arguments in System Design*, *in* 2-4 ACM TRANSACTIONS IN COMPUTER SYSTEMS 277 (1984), *available at* http://www.reed.com/Papers/EndtoEnd.html.

moving the functions and services upward in a layered design, closer to the applications that use them, increases the flexibility and autonomy of an applications designer. Conversely, the lower layer of a system should support the widest possible variety of services and functions, so as to permit applications that cannot be anticipated.[68] In other words, the "intelligence" in a network should be located at the top – at its "ends", where users put information and applications onto the network. The "pipes" through which information flows, the communication protocols themselves, should be as simple and as general as possible.[69]

Like other design principles, end-to-end arguments do not solve a specific design problem. Instead they impose a structure on the design space. The structure imposed by the e2e principle incorporates two complementary goals: (1) Higher-level layers, more specific to an application, are free to, and thus expected to, organize lower level network resources to achieve application-specific design goals efficiently (application autonomy). (2) Lower-level layers, which support many independent applications, should provide only resources of broad utility across applications, while providing to applications usable means for effective sharing of resources and resolution of resource conflicts (network transparency).[70]

(b) ARCHITECTURE AND VALUES

It might be that the e2e principle was first adopted mainly for technical reasons, but the imposition of this certain structure on the network has important social and competitive consequences.

i. COMPETITION

End-to-end expands the competitive horizon, by maximizing the number of entities that can compete for the use and applications of the network. As there is no single strategic actor who can tilt the competitive environment (the network) in favor of itself, and no hierarchical entity that can favor some applications over others, an end-to-end network creates a maximally competitive environment for

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68 Programmability in a lower layer can be seen as a means to defer design choices upwards in the layering, closer to the application, *and* later in time. *See* Reed et al., Active Networking and End-to-End Arguments, *available at* http://web.mit.edu/Saltzer/www/publications/endtoend/Ane2ecomment.html.

69 *See* Lemley & Lessig, supra note 30, at 930-31.

70 *See* Reed et al., *supra* note 68.

innovation, which by design assures competitors that they will not confront strategic network behavior.[71]

Thus, the implementation of e2e enforces a kind of competitive neutrality. The network does not discriminate against new applications or content because it is incapable of doing so.[72] An e2e architecture promotes a type of competitive process and innovation that exhibits the fundamental characteristics of audacious or atomistic competition. And precisely this market structure is preferable when it comes to innovation, as is argued by some in the debate about the relation between market structure and innovation. According to these voices, innovativeness is higher in competitive markets than in those with monopolistic structure.[73]

This allows for a general proposition about the competitive environment of systems products. Because of the complexity that systems products normally exhibit, and because of the qualitative uncertainty inherent in the process of innovation, multiple approaches and numerous participants provide greater genetic variety than would a simple innovator (or a small number of innovators), which leads to more rapid trial-and-error learning.[74] When the Internet is read as a kind of giant systems product because of the above-mentioned modularized structure, it becomes clear that the two design principles – network modularization and e2e pattern – reinforce each other's competitive tendencies. The first principle, by layering the network, multiplies the breeding grounds for innovation vertically, and the second multiplies them horizontally.

ii. CONSTITUTIONAL DIMENSION

Shifting function and "intelligence" to the ends of the network and keeping the network simple and "insensitive" to the distributed data has not only an anti-discriminative effect among inventors, but also among speakers. When there is a lack of intelligence inside the network, it is hard to discriminate among speakers and different types

71 *See* Lemley & Lessig, supra note 30, at 930-31.

72 *See* Lawrence Lessig, *Innovation, Regulation, and the Internet*, 11-10 THE AMERICAN PROSPECT (2000), *available at* http://www.prospect.org/print-friendly/print/V11/10/lessig-l.html.

73 This has been demonstrated by Kenneth Arrow, *Economic Welfare and the Allocation of Resources for Innovation*, *in* THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS 609-25 (Richard Nelson ed., 1962); *see also* F. M. Scherer & David R. Ross, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE (1990) (providing some cross-sectional tests of this proposition).

74 *See supra* note 5, at 207.

of speech. The e2e principle promotes the autonomy of the endpoint by keeping out potential interference from intermediaries. Architecture thus becomes a protector of free speech. As has been stated for the larger context of the Internet's overall architecture (relative anonymity, multiple points of access, no necessary tie to geography, no simple system to identify content, tools of encryption), of which the e2e is a significant part: "the architecture of cyberspace is the real protector of speech there; it is the real 'First Amendment in cyberspace', and this First Amendment is no local ordinance."[75] An implementation of the e2e principle appears therefore as a powerful catalyst for the exchange of uncensored speech among autonomous persons – a goal supported by both of the two main, and often conflicting, traditions of justification for the protection of free speech, the "self-realization" and "self-government" theories.[76]

To take this way of thinking one step further: Given its idea of minimizing the influence and power of intermediaries, the e2e principle reflects nothing less than a whole governance structure of the kind envisioned by populist forms of democracy. In fact, it was a kind of *idée directrice* among thinkers of the French Revolution to postulate the social ideal of an intermediary-free interaction among atomized individuals: "*il n'y a que l'état et l'individu*". The goal was to establish a direct and unfettered discourse among the citizens, uncorrupted by any power of intermeddling social entities that could distort the chain of legitimacy leading from the individual to the government.

Given this concept of society, the proper exercise of economic liberty is not in tension with political liberty but instead supports it. The economic characteristics of atomistically competitive markets converge with democratic principles. By dispersing and decentralizing private power, the atomistic competition limits this power and its potential to influence the political process; it promotes a level playing field for all voices to be heard in the process of democratic discourse. Moreover, low barriers of entry in atomistically competitive markets provide for the realization of autonomy and freedom of entry.[77] There is indeed an area of overlap between the significance of e2e for the furtherance of democracy and autonomy, as the dissipation of power

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75 LAWRENCE LESSIG, CODE AND OTHER LAWS OF CYBERSPACE 166-67 (1999).

76 For a concise account of these theories of the First Amendment, see Daniel A. Farber, THE FIRST AMENDMENT 3-6 (2d ed., 2003).

77 *See* Scherer & Ross, *supra* note 73, at 18 (explaining that when the no-barriers-to-entry condition of perfect competition is satisfied, individuals are free to choose whatever trade or profession they prefer, limited only by their own talent and skill and by their ability to raise the (presumably modest) amount of capital required).

reduces at the same time the possibilities of external control on the individual.

The implementation of the e2e principle in the information environment does not promote autonomy not just in a way that it provides for the absence of impositions on it. In addition to this aspect, which rests on the traditional liberal concept of "negative freedom" from whatever constraints, e2e also promotes sustainable models of self-governance. This becomes especially visible in the emergence of peer-production which represents a change in the menu of options for being productive in the information economy. In an economy where corporate organizations control the production process, and the market distributes these products, consumption is strictly separated from production. Compared to that it, is an economic – and ultimately a social – transformation when individuals organize themselves in productive networks and communicate with one another about which projects are worth pursuing and who might want to take them up.[78] In "peer production" thousands of individuals can collaborate on complex projects relying on a low-cost continuous information exchange which replaces the price signals and hierarchical commands as the primary mechanism of cooperation and coordination.[79] Given the additional precondition of low-barrier access to existing information, which is the raw material from which new information goods are made, the individuals can creatively utilize materials to shape their own information environment[80] so that consumption and production are integrated. A substantial part of this process is the development of community standards and mutual monitoring, because common efforts that lack such mechanisms for self-ordering will fail as productive enterprises and as structures for organizing social life.[81] By providing the appropriate institutional design the law could support such self-ordering of distributed peer-production communities.

iii. CRITIQUE

78 *See* Benkler, *supra* note 21, at 190.

79 *See* Yochai Benkler, *The Battle over the Institutional Ecosystem in the Digital Environment*, 44-2 COMMUNICATIONS OF THE ACM 84, 88 (2001).

80 One way to keep barriers low exists when users "share their products in an economy of gifts, reputation, and relationally-based rewards." Benkler, *supra* note 21, at 190. Such an approach would depend only on a consensus among the participating users, supported by legal means such as "creative licensing." However, the development of such a peer model of production into a viable alternative to the old models of production would require that large-scale commercial producers are not allowed to enclose much of the universe of useful information inputs with the help of law and technology.

81 *See* Benkler, *supra* note 79, at 90.

The value of the e2e principle is not beyond doubt. One might also argue about the extent to which it is actually implemented and is shaping the structure of the Internet today.

As far as the promotion of atomistic competition is concerned, there is a long debate among economists whether it is indeed competition that spurs innovation or, rather, monopoly structure. A line of thought going back to Schumpeter[82] argues that since developing innovations is costly, the most innovative firms should have a large stream of resources for R&D. Further, since the incentive to innovate is greatest when there is little threat of imitation, the most innovative firms should have few competitors. Finally, successful innovation may itself lead to market power and excessive, i.e. supra-competitive, profits. This implies three hypotheses: large firms are more innovative than small firms, monopolistic industries are more innovative than competitive ones, and firms will be more innovative when they anticipate that they will be allowed to exploit the market power created by their innovation.[83]

Insofar as an implemented e2e principle may promote a society of atomistic speakers, this might happen at the expense of social competence, social responsibility and civic virtues. The concern is about a kind of "overindividualized" society whose members' preferences are served by "perfected" markets, for example, markets for news, entertainment and information in which the individual will receive information only on topics and views that he has sought rather than reached out to discover. "Atomizing technology" may have a transformational effect on two features deemed critical to a democracy and a well-functioning system of free expression: the unplanned, unanticipated exposure to material by citizens, and also common experience within a society.[84] Skeptics predict that the common public places will become deserted and the resources of social cooperation and solidarity will run dry. They are afraid that the public will be

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82 *See* Joseph A. Schumpeter, CAPITALISM, SOCIALISM, AND DEMOCRACY 87-106 (1942) (concluding that: "it is not sufficient to argue that because perfect competition is impossible under modern industrial conditions – or because it always has been impossible – the large-scale establishment or unit of control must be accepted as a necessary evil inseparable from the economic progress which it is prevented from sabotaging by the forces inherent in its productive apparatus. What we have got to accept is that it has come to be the most powerful engine of that progress and in particular of the long-run expansion of total output not only in spite of, but to a considerable extent through, this strategy which looks so restrictive when viewed in the individual case and from the individual point of time. In this respect, perfect competition is not only impossible but inferior").

83 *See* Ellig & Lin, *A Taxonomy of Dynamic Competition Theories*, *in* DYNAMIC COMPETITION AND PUBLIC POLICY 16, 19 (Ellig ed., 2001).

84 This is the concern discussed by Cass R. Sunstein, REPUBLIC.COM (2001), reviewed by Stefan Bechtold, 3 EUR. BUS. ORG. L.R. 237 (2002).

obliterated and the formation of cultural identity will be abandoned since culture can only survive in an inhabited social space. This strand of criticism argues that in the framework of modern western society, individual and collective identity building was always a cooperation between individualist and universalist[85] values on the one side and, on the other side, local values as expressions of the fact that citizens are socially embedded, historically determined and culturally formed. Otherwise, it is argued, the political community would not have been able to hold its standards and to reproduce itself on the normative level which it has created for itself.[86]

Finally, regarding the e2e principle's embodiment of the idea of intermediary-free interaction, it has to be remembered that the Internet always had intermediaries. Therefore some critics got the impression that e2e proponents are just happiest with the intermediaries they know (e.g. service providers – initially universities) and that they are using the end-to-end argument as a way to stop new intermediaries;[87] that they oppose a respective change in the architecture of the higher layers by arguing that such change would be technically incorrect. Whoever would be able to define the historically "true" Internet would be able to trump opposing ideas by referring to "objective correctness": "those that can define the past get to define the future."[88]

This critique brings up an important aspect of the open access debate: the normative status of technical principles. To apply technical arguments as a proxy for normative arguments would indeed be very problematic, but not all e2e proponents step into this normative trap. They are well aware of the need to make deliberate choices.

Lessig's argument, for instance, runs like this:[89] (a) technical codes/architectures can embed fundamental, sometimes even

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85 The foundations of the organizational models, which the normative individualism is arguing for, are universalist: capitalist economy, rule of law and democracy are – with respect to their legitimacy – rooted in human rights egalitarianism.

86 *See* Wolfgang Kersting, *Global Networks and Local Values*, *in* UNDERSTANDING THE IMPACT OF GLOBAL NETWORKS ON LOCAL SOCIAL, POLITICAL AND CULTURAL VALUES 9, 23 (Christoph Engel & Kenneth H. Keller eds., 2000).

87 Christian Sandvig, *Communication Infrastructure and Innovation: The Internet as End-to-End Network that Isn't* (forthcoming) (manuscript at 23), *available at* http://www.spcomm.uiuc.edu/users/csandvig/research/Communication_Infrastructure_and_Innovation.pdf.

88 *Id.* at 24-25.

89 *See* Lessig, *supra* note 75, at 59 (describing politics as the process of deciding among values). For a concise account of Lessig's argument, see David G. Post, *What Larry Doesn't Get: Code, Law, and Liberty in Cyberspace*, 52 STAN. L. REV. 1439, 1455 (2000).

"constitutional," values; (b) to choose among these technological designs is, therefore, to make important choices among different values; and (c) this choice among values is to be made by collective decision-making – which means by politics, and not by markets.

This argument transforms the question of choices about technology design into one of the appropriate selection mechanism. Whereas the first two steps of this reasoning are widely shared, "net liberals" quarrel with the notion that the choices to be made among value-laden architectures are therefore political decisions that should necessarily be subject to "collective" decision-making. These choices should instead be made by the individuals. David Post, for instance, underlines this by drawing on the similar function of the codes of the new digital architectures (both the network protocols and the new truly linguistic constructs like Java, HTML, C++) and human languages as means by and within which we construct social reality and which embed values throughout. Both semantic/syntactic structures and technical architectures should not be subject to the collective for decision making but rather evolve by an aggregated series of individual and sub-group decisions.[90] However, this "aggregation" or coordination of dispersed individual wills is mainly mediated by the market mechanism.

(c) CONCLUSION

The question of whether or not to impose an open access regime on broadband cable modem service has to be answered by considering the function the cable network is put into when used to provide access to the Internet. At that moment it operates as the lowest physical layer of a modularized communication medium. It becomes part of a bigger architecture which embodies certain social values.[91]

This architecture is contingent. First, it is the product of modularization which made it possible to decouple the identity of physical structure and function. Second, it is the outcome of locating function at the "ends" of the network. Third, free interaction among these ends was unleashed by an open standard of interconnection protocols (at the code layer) which enabled access regardless of the specifics of the machines used at the ends.

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90 *See supra* note 75, at 1456-58.

91 Note the functional character in Lessig's analysis: "[I]f cable wants to carry TCP/IP, then the values of the Internet should trump the control of cable. Any major network that wants to piggyback on the Internet's success should piggyback with the values of the Internet kept in mind." Lessig, *supra* note 60, at 248.

The realization of the first two factors seems to have taken place after a rigorous open access policy was imposed on the telephone network – beginning with the break-up of AT&T in 1984 and culminating with the Telecommunications Act of 1996. Prior to these regulatory steps, the owner of the telephone lines controlled the network. Use of the network in ways not specified by and authorized by AT&T was forbidden. For example, it was unlawful to attach devices that performed services not offered by AT&T or to provide services that competed with the services provided by AT&T.[92] Under the imposed open access regime the network owners are no longer allowed to discriminate against other uses of their telephone lines.[93] The result was the *evolution* of a hyper-network whose architecture was not determined by the owner of the real network it is based on. To be clear, the claim is not that this was the only cause for the appearance of the Internet. For instance, the mentioned establishment of an open code was another very important factor. But removing control from ownership opened the *possibility* of building network architectures on top of physical facilities unrestrained by the will of the owner of these facilities.

Interestingly, the architecture that actually evolved, end-to-end, cannot – by technical means – discriminate among different uses of the hyper-network. What happened was that the forced break-up of a "bottleneck" facility[94] (lower platform) led to a competitive architecture on higher platforms.

Thus, two steps can be identified retrospectively: First, regulation created the possibility of unrestrained, or at least much less restrained, network design. Second, experimentation with an end-to-end architecture in a hyper-network, an experimentation that again

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92 *See* Lemley & Lessig, *supra* note 30, at 933 (referring to *In re Use of the Carterfone Device in Message Toll Tel. Serv.*, 13 F.C.C.2d 420 (1968), and *Hush-A-Phone Corp. v. United States*, 238 F.2d 266 (D.C. Cir. 1956)).

93 *See* Lessig, *supra* note 72 (stating that had it not been for the open-access rules that the government imposed upon telephones, the telephone companies would most likely have behaved just as every network owner in history has behaved – to control access and use architecture to minimize competition).

94 Some commentators read the implementation of open access in telecommunication indeed as a consequent application of the antitrust doctrine of "essential facility" which says that essential facilities that could not feasibly be duplicated must be shared among rivals. *See* Gerald R. Faulhaber, *Access ≠ Access1 + Access2*, 2002 L. REV. M.S.U.-D.C.L. 677, 678 (stating that *United States v. AT&T*, 552 F. Supp. 131 (D.D.C. 1982), was based entirely on the concept that the telephone local access line (the local loop) was a bottleneck facility).

was backed by considerable state action[95], led to a result of high social value.

Regulation could try to stabilize this evolutionary state by preserving the principles that distinguish the Internet from earlier, less successful networks. How much innovation was due to the implementation of the e2e principle is as unknown to us as whether the Internet would have grown as it did without e2e. But having tripped onto "this environment of extraordinary innovation", it is argued, we should be cautious before we allow it to be changed. The burden should be on those who would compromise those principles in which the Internet differs from former networks.[96]

Under conditions of uncertainty a cautious policy of transitional stabilization of evolutionary gains seems reasonable. Bearing in mind that there are always alternative policy options for designing the network, the regulatory imperative might be to minimize the power of intermediaries. Interaction among (atomized) individuals would be normatively advanced as a certain network logic. The idea is to stabilize a new design with some – not yet fully explored – merits so that it is not reversed into an old design which, we know, had less potential.

Building a certain network architecture is one thing, but it is another thing to create the possibilities for building network architectures. Here, it is not about fostering a kind of artificial stasis in the process of network evolution, but about establishing the conditions for network evolution to take place, whether it is more influenced by collective decisions (Lessig) or individual ones (D. Post).

The evolutionary gain at stake in the debate about cable regulation is greater because it is one of second degree. The enforced "freeing" of function enabled the construction of "higher" platforms – whatever values these platforms might embody. This was achieved by reallocating the access and interconnection property right away from the facility owner to third parties. The telephone line owners were deprived of the power to control network design. As long as cable facilities are bottleneck resources for broadband Internet access (like telephone lines were bottleneck resources for narrowband applications), there is no reason not to pursue a parallel policy. As of today the market share of cable in Internet broadband access amounts to approximately 70%. In the future broadband technology might

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95 For the government's role in developing the Internet, see Edward L. Rubin, *Computer Languages As Networks and Power Structures: Governing the Development of XML*, 53 SMU L. REV. 1447, 1449-52 (2000).

96 *See* Lessig, *supra* note 72.

replace narrowband Internet access completely – with no signs of decreasing market share of cable, rather the contrary.

The regulatory task in the process of network evolution then is to prevent power in the physical platform from being leveraged into higher platforms. This protects the evolutionary independence of the distinct platforms. Each platform should be able to find its own governance principles (collective v. individual decision-making) and its own mix of openness and closure (open/closed standards; open/closed DRM systems, etc.). Each platform should be able to choose its own peculiar balance of freedom and control. What has to be established then is a coordinated competition policy that accounts for the fact that the competitive conditions on one platform can influence the architectures on another.

A decision about a coherent access framework should not be postponed.; however, it is another question whether the moment for regulation has come just yet. On the one hand, it might be argued that it should first be seen if market competition alone can protect open access, bearing in mind that competition only needs to be workable, not perfect. On the other hand, this must happen in a reasonably timely way. Timeliness is a critical question here because "Internet time" means that sometimes the regulator may not be able to forebear several years to see if competition arises.[97] Taking into account the importance of the involved values, individual and public communication infrastructure, the amount of time to allow might be very short.

D. ACCESS TO VIRTUAL NETWORKS FOR COMPUTER TECHNOLOGY

Modularized technology is not just a phenomenon of communication networks. In fact, one might primarily think of it instead in the context of computer technology.

In this context, the term "platform" has become synonymous with operating systems. Operating systems function as platforms for software applications by exposing routines or protocols that perform certain widely used functions, so-called "Application Programming Interfaces" (API). These functions do not then need to be duplicated in

97 *See* Cooper, *supra* note 30, at 3.

the code of the application itself, but can instead be called upon from the operating system.[98]

A functional equivalent to operating systems are so-called "middleware technologies," such as browsers, which also serve as platforms. Still another example is that of microprocessor chips, or CPUs, which control the central processing of data in computers and are thus determinative not only for what operating systems can run on a certain machine but also for other parts of the computer's hardware architecture.[99]

These platforms make up the bases of "virtual networks" whose participants are linked by the platform's standard around which complementary products must be developed.[100] These standards in turn are not physical things, but are constituted in the form of intellectual property (IP) rights.

In contrast, the rights in networks at the physical layer of the Internet were property rights in tangible property. Structurally, this makes no difference, because all property rights are intangible, constituted by a relational proposition.[101] The rights to exclude, use, and sell have the same essential character regardless of the type of property to which they are attached.[102] But the peculiarity of IP rights is that they are just granted for a special purpose: "to promote the progress of science." As a consequence, a clear conflict about IP rights can be expected if they are employed in a way that inhibits the innovation process. This is especially the case when the power those standards confer on their "owners" is leveraged into adjacent competitive segments, such as higher layers or modules, for instance by restraining the development of complementary goods.

The broader, "framing" question then is how the function of platforms in a modularized technological environment, in this case the

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98 *See* U.S. v. Microsoft Corp., 253 F.3d 34, 53 (D.C. Cir. 2001).

99 *See* Intergraph Corp. v. Intel Corp., 3 F. Supp. 2d 1255, 1261 (N.D. Ala. 1998) (explaining that computers manufactured by Original Equipment Manufacturers ("OEMs") to use Intel microprocessors must be specifically designed and manufactured to meet the precise physical and technical requirements of the Intel architecture).

100 *See infra* II(A).

101 *See* Jeremy Bentham, THEORY OF LEGISLATION 112-13 (4th ed. 1882) ("There is no image, no painting, no visible trait, which can express the relation that constitutes property. It is not material, it is metaphysical; it is a mere conception of the mind . . . The idea of property consists in an established expectation; in the persuasion of being able to draw such or such an advantage from the thing possessed, according to the nature of the case").

102 *See* Steven Semeraro, *Regulating Information Platforms: The Convergence to Antitrust*, 1 J. TELECOMM. & HIGH TECH. L. 143, 159 (2002).

computer industry, affects the property rights in these platforms. The more narrow question again seems to be how to safeguard access to these platforms – which have now become standards building virtual networks so that the main form in which access will occur here is by establishing interoperability between module products.

The answer must again be given by looking at the governance mechanisms to which the platform property is subject. Unlike in communication networks where the history indicates that markets were never fully trusted to govern these networks, the default assumption for governance in the field of computer systems technology has been for the market. As is generally the case, competition is counted on to limit the arbitrary or exploitative exercise of private property rights. If markets cannot properly operate and discipline the holder of the IP rights in a systems product because he is a monopolist, the instrument of antitrust litigation is at hand.

Therefore, we will first look at recent antitrust cases and the statements that can be extracted from them about open access and interoperability respectively.

1. MANDATING ACCESS THROUGH ANTITRUST

(a) INTERGRAPH V. INTEL

Initially, Intergraph – an OEM (Original Equipment Manufacturer), primarily producing graphics workstations - based its computers on processors for which the company owned the patents ("Clipper" technology). Intergraph later discontinued further development of its own Clipper processor and switched to using processors from Intel who is a monopolist in the CPU market.[103] In turn, Intel designated Intergraph with the status of a "strategic customer," providing Intergraph with prototype CPUs and trade secret advance technical information so that Intergraph was able to adapt their computers to new Intel CPUs before their official release. Intel

103 At the time of the trial, Intel had a market share of 80% in the world CPU market. Barriers to entry into the CPU market are high, because of a large number of Intel and non-Intel patents on CPU technology; sunk costs of design and manufacture; economies of scale; network effects, or the need to ensure compatibility with complementary software products (such as Windows operating system), an issue that Intel had mastered by virtue of Windows/Pentium intellectual property cross-licensing arrangements with Microsoft (the "Wintel" alliance).

did so, however, under non-disclosure agreements that were terminable at will.

Later on, Intergraph claimed that Intel had infringed Intergraph's Clipper patents. As negotiations about a license for the patents failed, Intel cut off its supply of trade secret information and prototypes. The purpose of this retaliation was to make Intergraph cross-license its Clipper patent to Intel on a royalty-free basis.[104] In response to this, Intergraph began to sue Intel for infringement of the Clipper patents and also moved to enjoin Intel from cutting off its special benefits. As Intel opposed this motion, Intergraph amended its complaint to charge Intel with violation of the antitrust laws.

The District Court held that Intel had misused its monopoly power in violation of Section 2 of the Sherman Act and granted a preliminary injunction requiring Intel to continue its supply practice.[105] This means that Intel retained the right to charge Intergraph for access to its IP, as long as it did so in a nondiscriminatory manner, i.e., as long as it provided access to Intergraph "at the same time," "in the same manner," and on "the same terms" as it did to Intergraph's "similarly situated competitors."[106]

The court reasoned that because of its monopoly power in the microprocessor market Intel had affirmative duties not to misuse its monopoly power and to compete in a manner that does not unreasonably or unfairly harm competition, and that Intel had violated these duties on the grounds of several theories of antitrust liability. Amongst other things, the court argued that antitrust laws impose on firms controlling an essential facility the obligation to make the facility available on non-discriminatory terms. Holding that reasonable and timely access to critical business information that is necessary to compete is an essential facility, the court concluded that timely access to Intel's CPU prototypes and secret technical information about them were essential facilities because they are not available from alternative sources, cannot feasibly be duplicated and Intergraph could not compete effectively in the relevant markets without access to them.

It further argued that Intel was liable under a monopoly leveraging claim because it had unlawfully used its monopoly power in the microprocessors market to foreclose or restrain competition by Intergraph in the market for graphic subsystems. Intel had already

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104 Note the contrast with the Xerox case: In the Intergraph case the refusal to license was not absolute; rather, the license was conditioned on the licensee's willingness to grant a royalty-free license to its intellectual property.

105 *See* Intergraph Corp v. Intel Corp., 3 F. Supp. 2d 1255 (N.D. Ala. 1998).

106 *Intergraph*, 195 F.3d at 1291-92.

entered that market and had clearly announced plans to expand in that market while at the same time denying Intergraph access to the CPUs and technical information it needed to compete. Finally, the court emphasized that the fact that Intel's proprietary information and pre-release products are subject to copyright and patents did not confer on it a privilege to violate or an immunity from antitrust laws.

On appeal, the Federal Circuit vacated the injunction.[107] The decision was based on the overarching rationale that in order to incur Sherman Act liability there had to be the presence of a competitive relationship in the market where the monopolistic behavior was alleged. According to the Federal Circuit, Intergraph and Intel did not compete in any of the relevant markets, neither in the market for microprocessors nor in the graphics subsystems market.[108] Nor does the essential facility doctrine depart from the requirement of a competitive relationship. A non-competitor's asserted need for a manufacturer's business information does not convert the withholding of that information into an antitrust violation.[109] The same rationale destroys the "leveraging" theory: that monopoly power in one market provides a "competitive advantage" in another market is only a violation of the Sherman Act when there is an adverse effect in the second market. There is no per se theory of future antitrust violation which would prohibit downstream integration by a monopolist into new markets.

Although the Federal Circuit therefore overruled the District Court's decision, it did not contradict the approach taken by the lower court. Had Intel been an actual competitor to Intergraph in the workstations market, the original decision probably would have had to be affirmed, since the decision of the appellate court does not indicate any other reasons to reverse the trial court.

The District Court's decision represents a well-founded balance between strong property rights and open access to information, an issue that pervades IP law in general.

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107 *See* Intergraph Corp. v. Intel Corp., 195 F.3d 1346 (Fed. Cir. 1999).

108 *Id.* Intergraph was not present in the processor market by virtue of its Clipper patents. Intergraph had abandoned the production of the Clipper and stated it had no intention to return production. Even if Intel was planning to enter the workstation market, there was neither evidence nor suggestion of Intel's monopoly power in that market.

109 The Federal Circuit emphasized that no court had taken essential facility beyond the situation of competition with the controller of the facility, whether the competition is in the field of the facility itself or in a vertically related market that is controlled by the facility.

First, it made clear that IP rights are not exempt from antitrust scrutiny. Although these entitlements grant exclusionary rights to innovators, they do not grant the right to engage in anticompetitive behavior. This is important to note because some courts appear to have declared that the anticompetitive effect of a patent or copyright holder's refusal to deal can never give rise to antitrust liability, unless the holder uses his statutory right to refuse to deal to gain a monopoly in a market beyond the scope of the patent.[110] The courts in these cases suggested that the scope of the patent defines an antitrust immunity for IP holders that applies irrespective of the effect of the IP holder's conduct on consumer welfare.[111]

In contrast to these decisions, the Supreme Court recognized in *Image Technical Services, Inc. v. Eastman Kodak Co.* that a patentee's refusal to deal is not immune from the antitrust laws.[112] On the basis of the Court's *Times-Picayune* decision, the Supreme Court concluded that a patent holder cannot exploit its patent to expand its dominant position into a different market. Accordingly, the Court has long recognized that IP rights, such as patents, do not immunize the patent holder from the antitrust laws, particularly where more than one market exists.[113] The District Court's opinion on this is also in accordance with the Antitrust Guidelines for the Licensing of IP issued jointly in 1995 by the U.S. Department of Justice and the Federal Trade Commission (IP Guidelines), which state that, regardless of the form of property, "certain types of conduct . . . may have anti-competitive effects against which the antitrust laws can and do protect. Intellectual property is thus neither particularly free from scrutiny under the antitrust laws, nor particularly suspect under them."[114]

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110 *See In re* Independent Service Organization Antitrust Litigation (Xerox), 203 F.3d 1322, 1327 (Fed. Cir. 2000) (acknowledging the "right of the patentee to refuse to sell or license in markets within the scope of the statutory patent grant" and stating "that, absent exceptional circumstances, a patent may confer the right to exclude competition altogether in more than one antitrust market" and declining to "inquire into [the patentee's] subjective motivation for exerting his statutory rights, even though his refusal to sell or license his patented invention may have an anticompetitive effect, so long as that anticompetitive effect is not illegally extended beyond the statutory patent grant"); *see also* Townshend v. Rockwell Int'l Corp., 55 U.S.P.Q.2d 1011, 1026 (N.D. Cal. 2000) (stating that "because a patent owner has the legal right to refuse to license his or her patent on any terms, the existence of a predicate condition to a license agreement cannot state an antitrust violation").

111 *See supra* note 102, at 153.

112 504 U.S. 451, 479 (1992).

113 *See* Ronald S. Katz & Adam J. Safer, *Should One Patent Court Be Making Antitrust Law For the Whole Country?*, 69 ANTITRUST L.J. 687, 702 (2002).

114 U.S. Department of Justice & Federal Trade Commission, Antitrust Guidelines for the Licensing of Intellectual Property (1995), at § 2.1, *available at* http://www.usdoj.gov/os/2000/04/ftcdojguidelines.pdf [hereinafter IP Guidelines].

Having set aside any assumption of IP immunity, the District Court in *Intergraph* defined the parameters within which IP rights operated in that case. By its order to continue access to the critical business information, the court established that Intel's proprietary rights in its microprocessor technology would be protected only by a liability rule, not by the usual property rule. Intel cannot prevent others from exploiting its property without its consent but receives financial compensation from those who do so. On this interpretation of the court's ruling, the interplay of IP and antitrust can be described as follows: when the denial of access to technology would raise serious antitrust concerns, the proprietary rights in that technology relax slightly, and the law shifts from a property-rule regime to a systems of liability-rule protections.[115]

(b) IN RE INTEL CORPORATION

The FTC complaint against Intel adds another important aspect.[116] It pivoted around the finding that Intel had cut off its supplies of chip samples and strategic information about its new products to three of its main customers (Compaq, Digital and Intergraph) in order to force these customers to grant Intel licenses related to processor technology. The focus therefore was on the impact of Intel's refusal to license in the markets for processors in which Intel was indeed competing with other firms.[117] What was alleged by the FTC was a pattern of refusing to deal with multiple buyers unless *they* granted blanket access to their IP rights.[118]

In the proceedings, Intel argued that an overabundance of processor patents threatened to stifle innovation since a processor manufacturer might be subject to multiple demands by holders of these patents ("patent minefield"). This risk could only be neutralized by pursuing cross-licensing policies. This position is not unsound. In fact,

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This does not mean that there are no important differences between IP and other forms of property. For the position that the antitrust laws should apply fully to IP but that their application must take important special characteristics of IP into account, see Robert Pitofsky, *Antitrust and Intellectual Property: Unresolved Issues at the Heart of the New Economy*, 16 BERKELEY TECH. L.J. 535 (2001).

115 *See* Wagner, *supra* note 8, at 1084-86.

116 In re Intel Corporation, No. 9288, Complaint (FTC June 8, 1998), *available at* http://www.ftc.gov/os/1998/9806/intelfin.cmp.htm.

117 Other than in the litigation before the courts, the FTC complaint was brought on the basis of a fuller factual record: Digital Equipment Corporation, unlike Intergraph, was at the time a direct competitor of Intel in the processor market through its Alpha chip.

118 *See* HERBERT HOVENKAMP ET AL., IP AND ANTITRUST (2002), § 13.4d.

the law normally treats royalty-free cross-licensing agreements as pro-competitive because they free both parties to compete on the merits without being restricted by overlapping or blocking patent rights. To the extent Intel really was attempting to avoid being "held up" by patentees making unreasonable claims, its demand for a license was regarded by some commentators not only as legitimate, but also as pro-competitive.[119]

On the opposite side, the FTC argued that Intel's exclusionary conduct effectively undermined the patent rights of firms dependent on Intel and reduced their incentives to develop new technologies that might compete with Intel processors. In a Section 2 argument, the FTC reasoned that Intel had maintained its monopoly power in the CPU market through exclusionary conduct that was not reasonably necessary to serve any legitimate, pro-competitive purpose, with the specific intent to monopolize both the current generation and future generation of CPUs.[120]

The FTC's argument becomes clearer when one considers that the courts had focused only on the downstream market and simply noted the absence of Intergraph in the upstream market for CPUs. But it should not be overlooked that the CPU market is more complex than a single market.[121] Instead, three distinct upstream markets can be identified in accordance with the IP Guidelines: (1) the existing market for CPU products; (2) the market for current CPU technology; and (3) the innovation market in which future CPU technology is being developed.[122] Intel's behavior was therefore anticompetitive because it coercively extended its lawful monopoly power over existing CPU products into the market for future CPU technology and goods, and used its patents to prevent others from engaging in lawful follow-on innovation.

The case was finally resolved by a consent decree in which Intel agreed not to stop dealing with companies merely because they sought to vindicate their intellectual property rights.[123]

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119 *See* Hovenkamp et al., *supra* note 118, § 13.4d.

120 *See* In re Intel Corporation, No. 9288, Agreement Containing Consent Order (FTC March 17, 1999), *available at* http://www.ftc.gov/os/1999/9903/d09288intelagreement.htm.

121 *See* Debra A. Valentine, Abuse of Dominance in Relation to Intellectual Property: U.S. Perspectives and the Intel Cases (Prepared Remarks before The Israel International Antitrust Conference, November 15, 1999), *available at* http://www.ftc.gov/speeches/other/dvisraelin.htm.

122 *See* IP Guidelines, *supra* note 114, § 3.2.1-.2.3.

123 Nevertheless, Intel reserved the right to end relationships with companies for a variety of legitimate business reasons. *See* FTC Consent Order, *supra* note 120.

However, the case raises the question of whether a proprietor should be forced to license its IP rights on the grounds of the "probable" anticompetitive effects of its refusal on the relevant market. The answer depends on whether protection of future innovation is conceived as a "good" deserving so much protection as to justify setting aside the idea that an IP holder is entitled to any returns it can get on its rights. If the FTC's approach is accepted, it follows that, despite IP rights, there are situations in which a firm with monopoly or market power may be required to create its own competition.[124]

Objections against this idea claim that antitrust complaints must be based on empirical evidence and that neither the case law nor economic analysis has yet articulated workable quantitative criteria to calibrate the incentives to induce an optimal amount of innovation.[125]

(c) UNITED STATES V. MICROSOFT

The Microsoft case[126] concerns possibly the most prominent example of a platform, the operating system for personal computers. Microsoft possesses, in form of its "Windows" products, monopoly power over the market for operating systems. The lawsuit against the company was brought on several grounds for antitrust liability, some based on Section 2 and others on Section 1 of the Sherman Act. In particular, Microsoft was charged of having violated Section 2 by engaging in a variety of exclusionary acts to maintain its monopoly by preventing the effective distribution and use of products that might threaten that monopoly.

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124 *See* David Balto, *Protecting Competition from the Abuse of Monopoly Power: The Intel Case*, 16 COMPUTER LAWYER 4, 9 (June/July 1999).

125 Sergio Baches Opi, *The Application of the Essential Facilities Doctrine to Intellectual Property Licensing in the European Union and the United States: Are Intellectual Property Rights Still Sacrosanct?*, 11 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 409, 447 (2001). He argues that antitrust complaints must be based on empirical evidence rather than on speculative assumptions about the "possible" or "probable" effects of a refusal to license in the relevant innovation market. However, if what antitrust laws are trying to protect is the process of innovation, and this process may take place before a product has even been created and put into the market, then agencies and courts will often have scant empirical evidence about innovation markets, since companies prefer not to disclose much information on their innovations. Moreover, the anticompetitive impact of a refusal to license on R&D is difficult to establish because a negative effect can often only be determined after such work has been completed.

126 United States v. Microsoft Corp., 253 F.3d 34 (D.C. Cir. 2001); *see also* 87 F. Supp. 2d 30 (D.D.C. 2000) (Conclusions of Law), 97 F. Supp. 2d 59 (D.D.C. 2000) (Final Judgment).

(1) One of the charges brought under Section 2 was that Microsoft placed certain restrictions in its agreements licensing Windows to Original Equipment Manufacturers (OEMs) which prohibited the OEMs from removing any desktop icons, folders, or "Start" menu entries; altering the initial boot sequence; or otherwise altering the appearance of the Windows desktop. Using these restrictions, Microsoft was able to control the usage share of browsers competing with its own browser "Internet Explorer" (IE), since having an OEM pre-install a browser on a computer is the most cost-effective method of distributing browsing software.[127] By controlling the browser market Microsoft was able to protect its monopoly in the operating systems market.

The reason for the relation between the two markets is based on the fact that browsers are middleware products which expose their own APIs. If a browser reaches a critical mass of users it will attract developers of application software who can begin to rely upon the browser's APIs for basic routines rather than relying upon the API set included in Windows. Ultimately, if developers write applications relying exclusively on APIs exposed by browsers, their applications would run on any operating system on which the middleware was also present. Netscape therefore wrote its Navigator browser for multiple operating systems. Now, if a consumer could have access to the applications he desired, regardless of the operating system he uses, simply by installing a particular browser on his computer, then he would no longer feel compelled to select Windows in order to have access to those applications; he could select an operating system other than Windows based solely upon its quality and price. Therefore, Microsoft's efforts to gain market share in the one market for browsers served to meet the threat to its monopoly in the other market for operating systems by keeping rival browsers from gaining the critical mass of users necessary to attract developer attention away from Windows as the platform for software development.[128]

Since the license restrictions prevented OEMs from removing visible means of user access to IE and since it is not practical for OEMs to install a second browser in addition to IE, they prevented

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127 One might also bundle the browser with Internet access software distributed by an Internet Access Provider (IAP) – a behavior Microsoft also engaged in. In exclusive agreements with IAPs Microsoft promised to provide easy access to IAPs' services from the Windows desktop in return for the IAPs' agreement to promote IE exclusively and to keep shipments of Internet access software using Netscape Navigator under a specific percentage, typically 25%. The Court of Appeals affirmed the District Court's decision holding that Microsoft's exclusive contracts with IAPs are exclusionary devices under Section 2. *Microsoft*, 253 F.3d at 68-71.

128 *See Microsoft*, 253 F.3d at 60-61.

many OEMs from pre-installing a rival browser. This conduct was held to be anticompetitive. Microsoft reduced rival browsers' usage share not by improving its own product but, rather, by preventing OEMs from taking actions that could increase rivals' share of usage. The court explicitly rejected Microsoft's argument that these license restrictions were legally justified because the company would simply exercise its rights as holders of valid copyrights. It made unmistakably clear that intellectual property rights do not confer a privilege to violate the antitrust laws.[129]

Microsoft did not limit its effort to shut out rival browsers to the means of managing its IP rights, but also pursued the same goal by technological means. Among other things, it bound IE to Windows technologically[130] by commingling code specific to browsing in the same files as code that provided operating system function, so that any attempt to delete the files containing IE would, at the same time, cripple the operating system. The court, sensitive to the fact that technology can function as a substitute for legal arrangements, condemned this practice as well. This bundling of separate functions prevented OEMs from removing IE, and detered them from installing a second browser which would mean increased product testing and support costs and would amount to questionable use of the scarce and valuable space on a PC's hard drive). Microsoft's general claim regarding the benefits of integrating the browser to pursuing "deeper levels of technical integration" appeared to be highly suspect because of the danger it posed for an unrestricted evolution of different technology modules.

(2) Furthermore, the court condemned Microsoft's actions to prevent Sun's Java technology from developing as a viable cross-platform threat.[131] The contracts the company had entered with Independent Software Vendors (ISVs) conditioned receipt of Windows proprietary technical information upon the ISVs' agreement to promote Microsoft's Java Virtual Machine (JVM) exclusively. This had a significant impact on the overall distribution of Sun's JVMs. Like the actions against Netscape this was an attempt to minimize the size and trajectory of a rival's product share, now in JVMs instead of

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129 *Id.* at 63.

130 For instance, it also excluded IE from the "Add/Remove Programs" utility, thereby discouraging OEMs from distributing rival products.

131 Java is a set of middleware technologies developed by Sun Microsystems. They include a set of programs written in the Java language, called the "Java class libraries", which expose their own APIs, and a Java Virtual Machine (JVM) which translates bytecode into instructions to the operating system. Java thus poses a potential threat to Windows' position as the ubiquitous platform for software development, because programs calling upon the Java APIs will run on any machine with Java class libraries and a JVM. *See Microsoft*, 253 F.3d at 74.

browsers. The aim behind this was again to take away the incentive for application developers to avail themselves of interfaces exposed by the nascent Java platform.

Again Microsoft also used technological means to stifle competition – this time by trying to eliminate the interoperability of the middleware. It deceived Java developers by distributing software development tools created to assist ISVs in designing Java applications which included certain functions that could only be executed properly by Microsoft's JVM. Thus, Java developers who were made believe they wrote cross-platform applications ended up producing applications that would run only on the Windows operating system.

(3) The District court chose a combination of structural and conduct remedies as an appropriate remedy for these violations of the antitrust laws. First, it ordered Microsoft to divide into two firms, one selling Windows and the other selling applications such as IE. This divestiture was certainly an extreme intervention into the company's property rights. Hence, it was strongly debated whether the breaking-up of Microsoft may be disproportionate compared to the infringements found by the District Court.[132] Of greater interest are the conduct remedies ordered. They appear to be a more appropriate and proportionate consequence for Microsoft's use of its property rights. For instance, decree section 3.b, entitled "Disclosure of APIs, Communications Interfaces and Technical Information," requires Microsoft to disclose to third-party developers, in a timely and non-discriminatory manner, the APIs and other technical information necessary to ensure that software effectively interoperates with Windows. Section 3.c, entitled "Knowing Interference with Performance," imposes a prohibition on modifying its operating system to interfere with or degrade the performance of non-Microsoft programs. Finally, section 3.e, entitled "Ban on Exclusive Dealing," forbids Microsoft from entering contracts which oblige third parties to restrict their development, production, distribution, promotion or use of non-Microsoft platform-level software.[133] These provisions mandate central elements of an open access regime: effective access and non-discrimination. In the course of further proceedings the parties entered into a settlement agreement which indeed sets forth a number of

132 Assuming that the objective of equitable relief is to restore the competitive structure and consumer welfare that would have developed absent Microsoft's anticompetitive conduct, it is reasonable to argue that the divestiture goes beyond what is necessary to restore this status quo ante. *See* John E. Lopatka & William H. Page, *A (Cautionary) Note on Remedies in the Microsoft Case*, 13 ANTITRUST 25, 27 (1999).

133 *Microsoft*, 97 F. Supp.2d at 65-69 (Final Judgment).

restrictions upon Microsoft's conduct.[134] Indeed, the conduct remedies ordered by the trial court reappear as elements in the provisions of that settlement (section 3.b is mirrored in III.D., section 3.c in III.H, and section 3.e in III.A.)

Whatever the concrete form of an access regime may be, a functional open-access regime required that Microsoft should not be able to use its rights in the platform standard to deny other innovators the ability to develop compatible products.[135] Such rules appear to be adequate mechanisms to protect the evolution of alternative platforms in the field of module technology.

2. SAFEGUARDING THE PROCESS OF INNOVATION

(a) ANTITRUST AND INTELLECTUAL PROPERTY

If the market for modularized information technology worked like markets in which companies offer rival products and compete purely on their respective merits, concerns about open access and interoperability would be a less compelling question. But because many of those markets are networks that lend themselves to a single, dominant standard, the emergence of proprietary ownership of a standard creates special concerns.[136] In particular, the cases in question show that network markets may require special approaches to ensure that competition and innovation proceed free from harmful disturbances. Competition *and* innovation are both necessary, because those "customers" who are for example "locked-in" on these markets are often business entities which build complementary products and need access to the standard platforms in order to further develop their products.

On the other hand, a complete commitment to openness may undermine the very goal of an open access policy, viz. to promote innovation. Imposing sharing requirements in whatever form on a company's invention[137] undermines ex ante incentives to invest.[138] An inventor must be allowed to appropriate the benefits of her invention,

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134 *See* United States v. Microsoft, 2002 U.S. Dist. LEXIS 22858 (D.D.C. 2002) (Final Judgment); *Microsoft*, 231 F. Supp. 2d 144 (court's approval of the conduct restrictions).

135 *See* Wagner, *supra* note 8, at 1128.

136 *See* Weiser, *Networks Unplugged*, *supra* note 7, at 4.

137 Invention, as it is used here, refers to any product early in development.

138 *See* Weiser, *Networks Unplugged*, *supra* note 7, at 7.

lest he decides not to innovate at all. Moreover, sharing requirements, or any other facilitation of cooperation, can also discourage other companies' investment in the search for a rival standard.

These reservations recommend caution when limiting IP rights through antitrust law.

(1) First, it has to be observed that the existence and enforcement of IP rights by no means necessarily conflict with competition. Such a view was common under the assumption that goals of antitrust and IP are different and in permanent tension with each other. Their relation was perceived as this: IP rights as conferred monopolies, and antitrust is designed to prevent monopoly.[139] This static view programmed a structural conflict into the co-existence of the two laws, and indeed this may have been the prevailing view in the past.

However, both premises are inaccurate. IP rights do not by themselves confer monopoly power. In most cases, a patent or copyright creates no market power at all. Although the IP right does confer the power to exclude with respect to the specific product (or process, or work) in question, there will often be sufficient actual or potential close substitutes for such products to prevent the exercise of market power.[140] And with respect to the goals of antitrust, it is not accurate to say that antitrust law forbids monopoly. While it is true that antitrust seeks to promote competition, the law has never made monopoly itself illegal ("The successful competitor, having been urged to compete, must not be turned upon when he wins.")[141] Rather, it is concerned with certain anticompetitive conduct intended to achieve market power.[142]

The Chicago School, with its focus on consumer welfare maximization, sharpened the notion that both laws share the same economic goal, namely: "to maximize wealth by producing what consumers want at the lowest cost. In serving this common goal, reconciliation between patent and antitrust law involves serious problems of assessing effects, but not conflicting purposes".[143] In this approach antitrust laws are viewed as consumer welfare enhancing statutes which do not blindly mandate rivalry, but require competition

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139 *See* Hovenkamp et al., *supra* note 118, § 1.3a.

140 *See* IP Guidelines, *supra* note 114, § 2.2.

141 *See* United States v. Aluminum Co. of Am., 148 F.2d 416, 430 (2d Cir. 1945) (Learned Hand, J.).

142 *See* Hovenkamp et al., *supra* note 118, § 1.3a.

143 *See* WARD S. BOWMAN, JR., PATENT AND ANTITRUST LAW: A LEGAL AND ECONOMIC APPRAISAL 1 (1973).

only to the extent that competition serves consumer interests.[144] Though the underlying reasoning may not be, this vision of common goals is now popular among courts[145] and agencies.[146] Antitrust and IP are seen as complementary efforts to promote an efficient marketplace and long-run, dynamic competition through innovation.[147]

(2) In this more differentiated approach it becomes clear that enforcement of antitrust can be pro-innovation[148] as the use of IP can be pro-competition. The latter happened, for example, in cases where an IP owner had used its IP rights to ensure that software that used a standard was interoperable, and to oppose efforts to "split" the standard.[149] Such a use was made by Sun in its litigation against Microsoft over the compatibility of Sun's Java platform.[150] Microsoft's development of its own proprietary version of Java that runs only on Windows troubled Sun because a Windows-specific version of Java would essentially allow Microsoft to destroy the cross-platform compatibility of the Java platform.[151] Such disruption of Java's platform independence raised antitrust concerns because it undermined the promise Java held for operating-systems competition. Sun's reservation of its IP rights in Java therefore provided it with the means to prevent unauthorized alteration of the standard and to preserve the integrity of a cross-platform standard that might otherwise be fragmented.[152]

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144 *See* Frank H. Easterbrook, *The Limits of Antitrust*, 63 TEX. L. REV. 1 (1984).

145 *See* Atari Games Corp. v. Nintendo of Am., Inc., 897 F.2d 1572, 1576 (Fed. Cir. 1990) (explaining that "the aims and objectives of patent and antitrust laws may seem, at first glance, wholly at odds [but] the two bodies of law are actually complementary as both are aimed at encouraging innovation, industry and competition").

146 *See* IP Guidelines, *supra* note 114, § 1.0 ("The intellectual property laws and the antitrust laws share the common purpose of promoting innovation and consumer welfare.").

147 *See* Hovenkamp et al., *supra* note 118, § 1.3a.

148 *See* IP Gudelines, *supra* note 114, § 1.0 ("The antitrust laws promote innovation and consumer welfare by prohibiting certain actions that may harm competition with respect to either existing or new ways of serving customers.").

149 *See* Lemley, *supra* note 24, at 1938.

150 For Microsoft's action against Java, see also *infra* II.D.1.c.

151 *See* Sun Microsystems, Inc. v. Microsoft Corp., 999 F.Supp. 1301, 1310 (N.D. Cal. 1998).

152 *See* Lemley, *supra* note 24, at 1939. Sun's approach of "proprietary pollution control" is itself questioned by some proponents of open information platforms because it carries the danger that a developer committed to maximizing interoperability may change its tack if its technologies succeed in the marketplace and suddenly impose new, restrictive terms ("intellectual property ambush"). *See* Molly Shaffer Van Houweling, *Cultivating Open Information Platforms: A Land Trust Model*, 1 J. TELECOMM. & HIGH TECH. L. 309, 316 (2002).

Besides this pro-competitive use of an IP entitlement itself there is of course the arsenal of IP rules which work as limitations on the granted exclusionary rights. They can be used by potential entrants to break into closed standards owned by a dominant firm. To mention just one example, IP law allows for "reverse engineering," a legal tool that can facilitate the opening of a standard in order to enhance competition on aftermarkets for applications of the dominant firm's platform product.[153]

(3) The pro-competitive effects of IP rights indicate that antitrust enforcement must consider the peculiarities of the industry the IP rights are used in. Indeed, even though the two sets of laws coexist in the service of long-run, dynamic efficiencies, and even though they share the goal of encouraging innovation, they attempt to do so in different ways. Antitrust operates by ensuring that market forces provide firms with incentives to offer new (i.e. better) products at lower prices, whereas IP laws directly create incentives to innovate products (and processes) of higher quality at lower prices. Whether these different means result in conflicts and how the regimes are harmonized in such cases depends on the peculiar structure of the industry in which the respective issues arise.

In fact, it is argued that antitrust enforcement in "new economy" markets should be very cautious. In industries in which continual innovation is important to social welfare, interfering with the acquisition and enforcement of IP rights, while pro-competitive in the short run, could actually harm social welfare in the long run by reducing innovation.[154] The court in the Microsoft case was well aware of this as reflected in a remarkable note on the extent to which antitrust doctrines that evolved in the "old economy", for example the Section 2 monopolization doctrines, should apply to firms competing in dynamic technological markets characterized by network effects.[155]

The argument that inflexible enforcement of old economy antitrust in the new economy could be harmful pivots around the "serial monopoly" hypothesis which suggests that in the "new economy," monopoly is the natural market structure, but technological

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153 And yet, there will also be a number of cases where this IP "self-help" option is not sufficient. At present, IP protection continues to protect a dominant standard because the contours of the reverse engineering doctrine have not been fully developed. And even where reverse engineering is legally permissible, it may not be practically effective. Therefore a permissive intellectual property regime might not be sufficient to facilitate a competitive market. Consequently, antitrust oversight must remain a check on a firm's control of a dominant standard. *See* Weiser, *Networks Unplugged*, *supra* note 7, at 16-17.

154 *See* Lemley, *supra* note 24, at 1938.

155 *Microsoft*, 253 F.3d at 49-50.

innovation ensures that all monopolies are just temporary. Innovation in technology-driven markets is so rapid and revolutionary that no market leader, even with strong network effects, can defend its position for long against numerous new entrants with "killer applications." Firms compete through innovation for temporary market dominance, from which they may be displaced by the next wave of product advancements ("leapfrogging").[156] This Schumpeterian competition proceeds sequentially over time rather than simultaneously across a market; it is a competition "for the market," and not "within the market."

From the perspective of IP law, such market characteristics seem to recommend a robust IP regime because firms will be more willing to invest when they anticipate that they will be allowed to exploit their innovation. Their incentive to innovate is greatest when there is little threat of imitation.

From the perspective of antitrust, these characteristics may imply that the traditional market definition/market share antitrust analysis is not appropriate in this sector. Such an "old economy" mode of analysis is bound to find barriers to entry even when they are necessary to fuel investment in innovation. This is because markets subject to strong economies of scale and network effects based on risky R&D investments do require high operating margins protected by short-term barriers to entry, or else investment would dry up.[157] Imposing "old economy" antitrust will deprive the successful firm of its temporary monopoly rents. Indeed, inherent in the serial monopoly hypothesis is the argument that an innovator needs a period of monopoly in order to recoup its investment in innovation. If competitors were able to immediately enter the market and become fully competitive in the static sense, then prices would drop and profits would be driven to zero, thus eliminating future incentives to innovate.[158] In this view, the period of monopoly for each innovator is in fact a reward for such innovators and the temporary monopoly rents are merely the quasi-rents to a social beneficial activity - much as patent protection helps generate quasi-rents for a limited period of time.[159] The logic of this approach is then that antitrust enforcement in the form of non-enforcement would substitute for IP.

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156 *Id.* (citing Howard A. Shelanski & J. Gregory Sidak, *Antitrust Divestiture in Network Industries*, 68 U. CHI. L. REV. 1, 11-12 (2001)).

157 *See* DAVID S. EVANS & RICHARD SCHMALENSEE, SOME ECONOMIC ASPECTS OF ANTITRUST ANALYSIS IN DYNAMICALLY COMPETITIVE INDUSTRIES (Natl. Bureau of Econ. Research, Working Paper No. 8268, 2001), *available at* http://www.nber.org/papers/w8268.

158 *See supra* note 94, at 701.

159 *See supra* note 94, at 707.

But such line of argument underestimates the risk that today's platform monopolist will try to inhibit the rise of the next monopolist and thereby turn itself into a permanent monopolist. He can do so by distorting the process from which the threat of new entrants derives from: the process of innovation. As seen in the Intel proceedings, one strategy is to withhold access to the dominant platform unless the inventor licenses its own know how. If the inventor agrees, this may be an efficient solution after the fact, but the prospect of this outcome will discourage efficient independent innovation. As seen in the Microsoft case, another strategy is to undermine the distribution channels and the technological interoperability of today's complementary applications which might have become tomorrow's platform competitors.

As post-Chicago proponents of a strategic analysis of "predatory behavior" have pointed out against the Chicago School's static view of neoclassical price theory under which a monopoly can do no more than make the most of its existing monopoly (see "fixed-sum" theory of monopoly), the danger is that a firm might try to change the structural conditions it faces in order to that it may receive greater profits in the future. By changing those underlying conditions, the monopoly may well be able to leverage itself into a position even more powerful than the one from which it started.[160] In addition to these active attempts at strategic foreclosure, there may well be structural barriers to prevent (re)entry once a rival has been eliminated or severely disadvantaged.

(4) The discussion of the peculiarities of "new economy" markets built around IP rights reveals that it is not desirable to promote rivalry through antitrust at any cost. On the other side, the specifics of property rights "in" networks – in the double sense: as (intellectual) property situated in network markets[161] and as a right in the standard that defines the network – do pose peculiar risks of anticompetitive conduct.

The dilemma then is that inappropriate antitrust intervention in the form of an early imposition of compatibility provisions and open interfaces can thwart innovation and competition just as an overly relaxed antitrust enforcement runs the risk that a firm uses the dominance of its platform to extract considerable monopoly rents and to leverage its power into adjacent markets viz. layers.

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160 *See supra* note 5, at 199-201.

161 For the possibility that the nature of network industries creates greater incentives for predatory strategies, particularly those that would raise entry barriers, see A. Douglas Melamed, *Does Regulation Promote Efficiency in Network Industries?: Network Industries and Antitrust*, 23 HARV. J. L. & PUB. POL'Y 147, 149-52 (1999).

However, the way in which the problem is articulated seems already to point to a strategy for appraoching the issue. Competition policy must know when to encourage rivals to compete for establishing a standard and when to acknowledge that there cannot be competition between standards, but only competition within a dominant one.[162] Where a particular standard has emerged on a platform, relying on that standard seems the only commercially reasonable way to compete.[163] To facilitate such competition antitrust needs to ensure that interoperability is not denied as a means of precluding competition[164] – at least in the given dimension of vertical relations to modules on other layers. In this case, antitrust-mandated access rules are adequate and can operate as elements of network governance.

This might be seen as the next step to be taken by antitrust. After having realized that rivalry has not to be endorsed in every circumstance, it would have to be recognized that antitrust may impose positive obligations to cooperate when cooperation is essential to enable the sort of rivalry that will benefit consumers most. This stands in contrast to the still-dominant belief that antitrust imposes only negative duties.[165] But a review of case law shows that there are many examples in which firms have been required to cooperate in order to facilitate competition. In this respect, cases like Intergraph and Microsoft are in line with *Terminal Railroad*[166], *Associated Press*[167], *Lorain Journal*[168], *Otter Tail Power*[169], *Aspen Skiing*[170], *MCI*[171] and *AT&T*.[172] At the same time, these decisions show that positive duties to cooperate do not automatically require the expansion of the "essential facility" doctrine which has been criticized on both legal and economic

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162 *See* Weiser, *Networks Unplugged*, *supra* note 7, at 7.

163 *See* Joseph Farrell, *Arguments for Weaker Intellectual Property Protection in Network Industries*, *in* STANDARDS POLICY FOR INFORMATION INFRASTRUCTURE 373 (Brian Kahin & Janet Abbate eds., 1995).

164 *See* Weiser, *Networks Unplugged*, *supra* note 7, at 17.

165 *See supra* note 102, at 147 (citing Goldwasser v. Ameritech Corp., 222 F.3d 390, 400 (7th Cir. 2000)) ("affirmative duties to help one's competitors ... do not exist under the unadorned antitrust laws"); USM Corp. v. SPS Technologies, Inc., 694 F.2d 505, 513 (7th Cir. 1982) (Posner, J.) ("There is a difference between positive and negative duties, and the antitrust laws, like other legal doctrines sounding in tort, have generally been understood to impose only the latter.").

166 United States v. Terminal R.R. Ass'n, 224 U.S. 383 (1912).

167 Associated Press v. United States, 326 U.S. 1 (1945).

168 Lorain Journal Co. v. United States, 342 U.S. 143 (1951).

169 Otter Tail Power Co. v. United States, 410 U.S. 366 (1973).

170 Aspen Skiing Co. v. Aspen Highlands Skiing Corp., 472 U.S. 585 (1985).

171 MCI Communications Corp. v. AT&T Co., 708 F.2d 1081 (7th Cir. 1983).

172 United States v. AT&T Co., 552 F. Supp. 131 (D.C. 1982).

grounds.[173] Antitrust does not have to rely on this doctrine when it condemns improper uses of market power to maintain or extend a dominant position either through an affirmative restraint of trade or a refusal to deal.[174] It is not so much about relying on a certain doctrine, especially since many of the issues in systems technology appear to be transdoctrinal,[175] but about activating a certain logic in the discipline of antitrust.

From this perspective, it may well be the case that the essential facility doctrine[176] is interesting because it sets forth a relation between the quality of an entry barrier and the probability that it may be overcome. In its pure form the doctrine says that a duty to provide access to the facility arises when the dominant firm's competitor faces an insurmountable barrier of access to the market if deprived of access to the facility.[177] In this formulation the relation is fixed: it assumes that there is no other way to compete than by access to the facility, the probability of a new entry is zero, and access has to be granted. Especially in technology-driven markets this assumption is too static (see text above on "killer applications"). In its broader logic, the doctrine asks to what extent the type of facility itself creates a barrier for the competitive process in which potential entrants experiment and innovate (in order to surmount the barrier).

Now, the facility in question does not have to be a physical one, but can consist in any kind of exclusivity position. Indeed, courts have even acknowledged IP rights as essential facilities.[178] But again, what matters is not that courts enriched the doctrine itself. What is

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173 *See* Phillip Areeda, *Essential Facilities: An Epithet in Need of Limiting Principles*, 58 ANTITRUST L.J. 841 (1990). Interestingly, the principles Areeda sets forth to limit the application of the essential facility doctrine are likely to be met in the cases like *Intergraph* or *Microsoft*. *See id.* at 852.

174 *See supra* note 102, at 149.

175 *See* Wagner, *supra* note 8, at 1083, stating that the *Intergraph* court could have dealt with the "transdoctrinal matter" other than in a antitrust framework.

176 As stated in *MCI Communications Corp. v. AT&T*, 708 F.2d 1081, 1132-33 (7th Cir. 1983), the elements of liability under the "essential facility" doctrine are: (i) control of the essential facility by a monopolist; (ii) a competitor's inability practically or reasonably to duplicate the essential facility; (iii) the denial to grant access to the facility; (iv) the feasibility of providing the facility.

177 Additionally, the duty to provide access arises when lack of access subjects competitors to a serious, permanent and inescapable competitive handicap that would render their activities uneconomical. *See* Opi, *supra* note 125, at 420.

178 Aside from the *Intergraph* court, for example, see *BellSouth Advertising v. Donnelley Information Publishing*, 719 F. Supp. 1551, 1566 (S.D. Fla. 1988) ("Although the doctrine of essential facilities has been applied predominantly to tangible assets, there is no reason why it could not apply . . . to information wrongfully withheld. The effect in both situations is the same: a party is prevented from sharing something essential to compete.").

important to see is that the proprietary ownership of a standard can also be a property right that creates a barrier to entry.[179]

Ownership of such a barrier to entry, as has been noted, is akin to the possession of a patent and their "prospect function."[180] When patents are sufficiently broad, they offer their holder a secure opportunity to orchestrate the subsequent development of the original idea. This analogy has led to the idea of the "scope" of an essential facility which suggests that the degree to which antitrust policy should concern itself with the ownership or control of a technical standard ought to be proportional to the scope of the standard over which the owner has de facto or de jure control. The owner of a standard that controls the compatibility of a large fraction of the components of a system is in a much better position to close off avenues of innovation that threaten the rent-earning potential of the standard; whereas the owner of a standard with relatively smaller scope is always in danger of being "invented around" or made obsolete if it closes off access or otherwise exercises its market power unduly.[181] In the case of modularized technology, one would have to add as another parameter the location of the standard within the layered architecture. A platform at the "code" level like an operating system is crucial for the interconnectivity in more than one layer; its owner is much more likely to be in control of the overall architecture of the system as a whole. A closed platform at that level would raise more concern than for example a closed application at the "ends" of the system for example.[182]

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179 For the notion that barriers to entry always boil down to property rights, whether de jure or de facto, see Harold Demsetz, *Barriers To Entry*, 72 AM. ECON. REV. 47, 49 (1982) ("the problem of defining ownership is precisely that of creating properly scaled legal barriers to entry.").

180 *See supra* note 5, at 219.

181 *See supra* note 5, at 194, 209, 221.

182 This takes account of the model of innovation in complex systems (like the computer). Because of the complexity that system products normally exhibit, and because of the qualitative uncertainty inherent in the process of innovation, multiple approaches and numerous participants provide greater genetic variety than would a single innovator, which leads to more-rapid-trial-and-error learning. *See* Richard R. Nelson & Sidney G. Winter, *In Search of Useful Theory of Innovation*, 6 RESEARCH POLICY 36, 70-72 (1977) (proposing a concept of different "selection environments"). Precisely to the extent that a standard is complex and reflects an underlying modularized technology, centralized control may actually limit the development of a standard. To work properly, complex standards require collaboration with users and with suppliers of the various components of the system. As Hayek has argued, such complex standard sets as human languages or the common law could only have evolved as "spontaneous orders". Even the proprietary developer of a standard needs access to the knowledge of a wide variety of collaborators, and even a proprietary standard is often something of a spontaneous order. *See* Langlois, *supra* note 5, at 219.

Modularized technology makes possible variation at the component level. In such cases the structure of property rights is crucial to the evolution of the technology and of competition. A relational reading of the essential facility doctrine helps to highlight the interdependency between competition and property rights, between antitrust and IP. We cannot think of competition independently of the property rights involved.

(b) PROPERTY MODELS FOR TECHNOLOGICAL EVOLUTION

Antitrust law can constrain the scope of IP rights.[183] When this is the case IP rights are weakened. Indeed this "weakening" is called for in situations where a dominant standard has evolved and there is no longer competition for the standard, but only within the standard. In these cases, it is argued, IP law should provide "relaxed protection over interfaces"[184] (quasi as IP's counterpart for antitrust's supervision that interoperability is not denied as a means of excluding competition). In some sense it is even correct to say that to require a party to open to others the standard it controls is effectively a taking of intellectual property rights.[185]

To get a clearer concept of what happens if IP rights are "weakened" it is helpful to make use of the "bundle of rights" model of property. It defines ownership not as an all-or-nothing proposition, but rather as a variable set of rights over a resource.[186] Each right represents the relation between two actors over the use and control of a scarce resource. Such a model of property is compatible with many different theories of what particular rights are to be included in the protected bundle and of how to protect those rights.[187] In any case it captures the idea that an owner may have imperfect control over his private property.

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183 *See* Hovenkamp et al., *supra* note 118, § 1.3d.

184 *See* Weiser, *Networks Unplugged*, *supra* note 7, at 17; *see also* Langlois, *supra* note 5, at 222 (describing the "weakening of intellectual property rights" in open systems).

185 *See* Weiser, *Networks Unplugged*, *supra* note 7, at 17; *see also* Langlois, *supra* note 5, at 222.

186 *See, e.g.*, Kaiser Aetna v. United States, 444 U.S. 164, 176 (1979) (describing an owner's right to exclude other people as a stick in "the bundle of rights that are commonly characterized as property").

187 *See* ROBERT COOTER & THOMAS ULEN, LAW AND ECONOMICS 75 (3rd ed., 2000); *see also* Michael A. Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 111 HARV. L. REV. 621, 662 (1998) ("At this level of generality, the bundle-of-rights metaphor can describe any type of property relationship, including private, commons, and anticommons property.").

When ownership is thus resolved into a bundle of property rights, a more precise description is possible of what happens when access to a network is mandated, be it a communication network or a virtual network: the property right to interconnect or to interoperate is allocated away.

This has been described for industries with physically-connected grids as an example of real networks. In the electricity industry, the regulatory approach moved from price regulation directed at the output market (electricity) to interconnection and unbundling rules aimed at inputs (transmission service). A new electricity merchant producer generates electricity but buys transmission service from the grid owner, who is legally obliged to grant access. Because access regulations shift the interconnection property right from the grid owner to a third party, an entrant can jump into the electricity market just by building a new power plant without needing to build an additional (and redundant) transmission grid.[188]

With respect to virtual networks and the function a platform has for further technological innovation, there is a spectrum of proposals for reconsidering the property regime of strong exclusionary entitlements known from markets for the exchange of physical goods. The problem can be approached from both sides, from IP law and from antitrust.

(1) In the field of modularized systems technology some have argued that IP law should not protect program elements that control the interface between modules at all, thus allowing unlimited access to such components by competitors.[189] And at least to the extent that the existence or scope of an IP right in a standard is undetermined, courts have eventually considered network effects in deciding whether or not to grant a new or stronger form of IP protection to the standard-setter.[190]

In *Lotus*, a case addressing the horizontal access issue, the First Circuit decided that Borland could incorporate Lotus 1-2-3's command hierarchy to build a rival spreadsheet program (Quattro), reasoning that the command hierarchy was not copyrightable at all because it

188 *See* Randal C. Picker, *Regulating Network Industries: A Look at Intel*, 23 HARV. J.L. & PUB. POL'Y 159, 167 (1999).

189 *See* Peter S. Menell, *The Challenges of Reforming Intellectual Property Protection for Computer Software*, 94 COLUM. L. REV. 2644, 2652-53 (1994).

190 *See* Mark A. Lemley & David McGowan, *Legal Implications of Network Economic Effects*, 86 CAL. L. REV. 479, 531 (1998).

was a "method of operation" of the 1-2-3 program.[191] In his concurrence, Judge Boudin, offering a competition policy rationale, recognized that the establishment of a standard (here a user interface and command hierarchy for spreadsheets) merited protection in order to encourage innovation. At the same time he made clear that complete protection could limit consumer welfare.[192] When a first mover like Lotus had already received a substantial reward for being first, IP protection may recede and allow others access to the industry standard so as to allow for competition.[193] The way in which IP protection "recedes" is of course variable. It might be by holding that the standard is not protectable by copyright (as the majority did) or by saying that the entrant's use of it is privileged by referring to the "fair use" doctrine (as implied by Judge Boudin). What is relevant to note is that IP treatment of interfaces crucially affects the nature of competition and how it does so.[194]

As implied by Judge Boudin's concurrence,[195] if we were truly to permit competition within de facto standards, we would have to deny all forms of IP protection to the interfaces that allow access to such standards.[196]

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191 *See* Lotus Development Corp. v. Borland International, Inc., 49 F.3d 807 (1995).

192 *See id.* at 821 (Boudin, J., concurring):

> But if a better spreadsheet comes along, it is hard to see why customers who have learned the Lotus menu and devised macros for it should remain captives of Lotus because of an investment in learning made by the users and not by Lotus. Lotus has already reaped a substantial reward for being first; assuming that the Borland program is now better, good reasons exist for freeing it to attract old Lotus customers: to enable the customer to take advantage of a new advance, and to reward Borland in turn for making a better product. If Borland has not made a better product, then customers will remain with Lotus anyway.

193 *See* Philip J. Weiser, *The Internet, Innovation, and Intellectual Property Policy*, 103 COLUM. L. REV. 543, 604-05 (2003).

194 *See* Lemley & McGowan, *supra* note 190, at 533.

195 *See* Lotus Development Corp. v. Borland International, Inc., 49 F.3d 807, 822 (1995) (Boudin, J., concurring) ("Indeed, to the extent that Lotus' menu is an important standard in the industry, it might be argued that any use ought to be deemed privileged.").

196 *See* Lemley & McGowan, *supra* note 190, at 533; *see also supra* note 231. The authors themselves ask for a more nuanced approach taking into account the nature of the network effect ("operating systems exhibit network effects because application programmers need to write compatible software, while user interfaces exhibit only the 'learning effect' of saving users from having to learn how to operate multiple systems"), and the status of present IP protection ("it is much more difficult to find a case considering network effects arguments as a reason to depart from or modify established intellectual property law"). Lemley & McGowan, *supra* note 190, at 533-37.

Indeed, the "open code" movement represents an attempt for unrestrained access to software platforms. Under this model, programmers collaborate on the creation of software programs and allow all users free access to the programs' source codes. This does not mean that IP is absent. In fact, the GNU/Linux software rests on a license (GPL license) which conditions that one keeps it open, and that one distributes it with its source as intact and open as one received it. With the help of this gambit open access is implemented itself in a network developing around the original version. There are no access problems in such a network because access is institutionalized in the network itself – with an open, instead of proprietary and closed, standard. No actor can gain ultimate control over the open-source code. The effect on innovation is that the developer on an open-code platform is assured that the platform will not behave strategically, i.e. that it cannot turn against him.[197]

This idea of openness reflects the assumption that, at least in the information sector, proprietary control is not necessary or desirable to encourage innovation. It is supported by a literature that makes clear that a large number of innovations would take place in the absence of any IP protection.[198] However, the open code movement is part of a larger "commons" model which suggests that information industries and the Internet function best when they are open and not susceptible to control by a proprietary firm.

(2) As an alternative to an entirely open system with no protection at all, others have pleaded for "incomplete entitlements" in IP in the context of networks. They believe that flexible entitlements, rather than strong exclusive rights, might better serve the need to balance social costs and benefits when it comes to reconciling the competing goals of promoting open standards and protecting the property rights of innovators. They argue that flexible entitlements may better accommodate diffuse societal values that would not be internalized by bright-line property rules.[199] This appears to be the deeper rationale of a proposal which started from the insight of economic theory that in situations where costs of locating, negotiating, and valuing transactions are high (as is the case in cyberspace), unclear entitlements may tend to facilitate bargaining.[200] Under such circumstances, clear rules will tend to facilitate innovative or informal bargaining arrangements, whereas bright-line rules appropriate to low

197 *See supra* note 72.

198 *See* Weiser, *supra* note 7, at 570.

199 *See* Dan L. Burk, *The Trouble with Trespass*, 4 J. SMALL & EMERGING BUS. L. 27, 53 (2000).

200 *See* Dan L. Burk, *Muddy Rules for Cyberspace*, 21 CARDOZO L. REV. 121 (1999).

transactions cost situations may simply lock the parties into their respective ownership positions, unable to reach a beneficial exchange. Aside from cases of high transaction costs, such "muddy" entitlements operate in much the same way as a divided entitlement which appears whenever more than one entity has a claim to a given property, i.e. where the property owner must share or cede some uses of the property under certain circumstances.[201] However, the basic observation is that real property law knows a variety of ownership entitlements (property rules, liability rules, divided claims, "muddy" standards etc.); that the same is true for IP law (for instance, the copyright doctrine of fair use is operating as a muddy entitlement);[202] and that this variety has evolved in response to *different transactional environments.*[203]

How this idea of incomplete entitlements works becomes clear in its assessment of unsolicited email. Under an exclusionary rule such as trespass, propertization in a networked environment encourages the holder of the exclusive right to attempt to free-ride upon the external benefits of the network, while at will avoiding contribution of such benefits to others.[204] In contrast, the "muddy" doctrine of nuisance requires that the cost of the intrusive activity outweighs the benefit. So a nuisance rule would allow server owners to exclude unreasonably costly uses of their servers, while allowing access for socially beneficial uses, even if the server owner might otherwise object. Nuisance would require computer owners to remain legally networked when necessary to generate beneficial positive network externalities.[205]

A similar rationale would justify the distinction that the owner of a dominant standard in a platform, like Microsoft for the operating system, cannot prevent others from accessing its interfaces when they engaged in building compatible programs, but that he is protected when somebody uses the access to interfaces just to build an imitating product without any functional surplus. In order to profit from the network effects its operating system platform is based on, Microsoft would have to allow others access for socially beneficial uses of the standard.

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201 *Id.* at 128.

202 *Id.* at 135, 140.

203 *Id.* at 179 (warning that "we should therefore be suspicious of arguments that promulgate only one type of rules desirable in every circumstance").

204 Consider the cases of *Intel Corp. v. Hamidi*, 15 I.E.R. Cases (BNA) 464 (Cal. Super. 1999), and *eBay v. Bidder's Edge*, 100 F. Supp. 2d 1058 (C.D. Cal. 2000), in which Intel and eBay profited from its connection to the network but at the same time hoped to make its systems unavailable for activities found objectionable.

205 *See supra* note 199, at 53.

(3) Another expression of the concept of incomplete entitlements – this time from the side of antitrust – is the previously mentioned idea that under certain circumstances the imperative of effective competition demands access to IP. That antitrust forces access to the IP without the consent of the rights holder is interpreted as a shift from property rules to liability rules in the protection of the IP.[206]

Under a property rule regime, parties are able to contract around the initial entitlement allocation and to set protections at their preferred levels.[207] In contrast, under a liability rule regime, parties may not transfer entitlements without paying state-mandated penalties.[208] Hence, the difference is also one of the decisional authority that distinguishes the two systems. Under property rules, the owner makes the decision to exclude or not; under liability rules, the option to take or not rests with outside the parties.[209]

The idea is that systems technology, i.e. "architectural" or meta-technology that determines what can connect to the system and what can operate within it (in this case platforms in modularized systems), is to be protected only by liability rules – as cases like *Intergraph* or *Dell*[210] indicate. This is as justified because of the combination of four characteristics of the markets for this technology: network externalities, interconnectivity, rapid innovation, and excludability.[211] Network externalities cause systems technology to become standardized, which makes access to the technology vital to industry participants. The high level of interconnectivity increases the number of participants that require such access, and the rapid pace of the market necessitates that they obtain access as quickly as possible. Further, the nature of systems technology enables its producers to exclude others easily, even without the assistance of the legal system. Exclusion through secrecy is possible because the development of compatible products requires detailed internal information about the platform technology, which is hard to obtain from outside. Even where reverse engineering is legally permissible, it may be too time-

206 *See* Wagner, *supra* note 8, at 1086, 1090.

207 *See* Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1092 (1972) ("An entitlement is protected by a property rule to the extent that someone who wishes to remove the entitlement from its holder must buy it from him in a voluntary transaction in which the value of the entitlement is agreed upon by the seller.").

208 *See id.* ("Whenever someone may destroy the initial entitlement if he is willing to pay an objectively determined value for it, an entitlement is protected by a liability rule.").

209 *See supra* note 200, at 127.

210 *See* In re Dell Computer Corp., No. 931-0097 (FTC 1996).

211 *See* Wagner, *supra* note 8, at 1096, 1101.

consuming with respect to the rapid technological change (as the interface might have already changed again in the meantime). And exclusion is also possible through technological design which can be engineered strategically not to accept or even to disadvantage other technology.

In the presence of these market characteristics, it is legitimate to confine the protection of such technology to liability rules which would ensure access to it. It should be noticed, however, that the access regime created by allowing antitrust to partially constrain IP is less invasive than other forms of restricting property rights through liability rule protection. In compulsory licensing, which also operates as a liability-rule system,[212] for example, the receiving party's ability to control and exploit is generally co-extensive with that of the original owner. Another example is the eminent domain power of the state, under which the private owner affected looses all rights to the land, and the state gains complete control of it. In contrast, the access regime neither deprives the owner of the right to control the disposition and dissemination of his technology, nor does it transfer the right to full information about a given platform technology. It grants access only to those parts of information about the platform which are crucial to building a compatible product. Thus, the owner of the platform standards retains significant exclusive rights in his technology.[213]

Speaking within the metaphor of property as a bundle of rights, it might be said that we are extracting a "stick" from an owner's bundle or protecting that stick with a liability rule rather than a property rule. It appears then that a "hybrid" liability and property rule regime is appropriate for platform technology which displays the characteristics in question.[214]

(4) The above discussion should have demonstrated that property in (dominant) platforms, which are not just "located" in but actually constitute virtual networks, should not be governed by principles that are built on a concept of property as an impenetrable right of exclusivity. It is a particular merit of those who argue against the allegedly unavoidable "tragedy of the commons" that they have highlighted the misconception that property is either totally privatized as "that sole and despotic dominion over the external things of the

212 *See* Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 CAL. L. REV. 1293, 1308-17 (1996).

213 *See* Wagner, *supra* note 8, at 1093.

214 Such a hybrid liability rule and property rule protection has also been proposed for physical communication resources. *See* Daphne Keller, *A Gaudier Future That Almost Blinds the Eye*, 52 DUKE L.J. 273, 319 (2002).

world, in total exclusion of the right of any other individual in the universe" (Blackstone), or totally under government control. Instead it should be recognized that there is a "variety of property systems". The observation has already been mentioned that a variety of ownership entitlements in real and IP law has evolved in response to different transactional environments.

A variety of property systems can be found not just at the level of states, but of groups or communities which autonomously organize the relations among their members. Their systems resemble private property in some respects, while retaining at the same time features that resemble open access. Some aboriginal tribes, for instance, have private household property in land in the winter, but collective property in land in the summer, due to the relative advantages of collective hunting during the summer. In other communities, river sites for the construction of fishing weirs were privately owned, but the weirs were village property, whereas the platforms on top of the weirs were again private property.[215]

For the commons proponents, these examples confirm that our own property system should not be so rigid that we miss intermediate bundles of property rights which may work most efficiently for certain resources and situations.[216]

In the given context of modularized platform technology, the lesson to learn from the commons movement is not that we should adopt a commons model in this case. Rather, it should draw our attention to the notion that there is not just one pre-fixed, strong form of property with one type of protection. For property "in" network environments, a flexible concept of property rights appears to be adequate in response to the described concerns about the competitive and innovative process.

E. IMPLICATIONS

In the examples discussed here, antitrust is crucial for the building of an open access regime for both types of networks. But antitrust is just one instrument for implementing access on information platforms. It only comes into play in the presence of market power, and this is often at a late stage, i.e. when competition has already shifted to intra-platform competition because a certain platform has

215 *See* Stuart Buck, *Replacing Spectrum Auctions with a Spectrum Commons*, 2002 STAN. TECH. L. REV. 6.

216 *Id.*

evolved as dominant. IP law is different. It has its own means to facilitate and to mandate access. The tools it offers can confer on potential competitors a significant self-help option.[217] Moreover, it can influence the process at an earlier stage, but in doing so it should be cautious not to discourage the search for alternative platforms. Allowing all firms immediate access to the initial standard at the outset of a potential standards competition may seduce potential rivals into taking advantage of an already developed standard, as opposed to creating their own. It also risks entrenching a single standard and precluding valuable competition.[218]

Constitutional law also comes into play where values other than competition or innovation, free speech for example, counsel for access to an information infrastructure.[219] As has been described above,[220], it can even recognize that certain technological architectures can serve as protectors of free speech. In this way constitutional law might support "access by architecture", so that access-providing architectures would have to be preferred to others on constitutional grounds.[221]

In their application of mandating access to information platforms both laws, antitrust and IP law, are reshaping property rights.

Drawing on the insight that there is not just one pre-fixed, strong form of property with one type of protection, but a variety of property systems, it was found that different types of transactional environments require different types of proprietary entitlements. In markets where goods are exchanged, strong property rights may be the best choice for institutional design. In this case, a clear demarcation between the proprietary status "before" and "after" the transaction is required. The transaction marks who profits from the use inherent in the good. In contrast, platforms are not exchanged. With respect to platforms use adds value. The value for the owner is increased by the uses made by others. These uses in turn depend on the options available on other layers of the modularized system. Such a peculiar

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217 *See* Weiser, *supra* note 7, at 600.

218 *See* Weiser, *supra* note 7, at 590.

219 *See* Turner Broadcasting System, Inc. v. FCC, 512 U.S. 622, 657 (1994) (emphasizing that "[t]he potential for abuse of . . . private power over a central avenue of communication cannot be overlooked. . . . The First Amendment's command that government not impede the freedom of speech does not disable the government from taking steps to ensure that private interests not restrict, through physical control of a critical pathway of communication, the free flow of information and ideas.") (citation omitted).

220 *See infra* II.C.2.b.ii.

221 Also constitutional law is of importance in coordinating and resolving conflicts between the different values involved.

environment raises specific concerns with regard to the competitive and innovative process, concerns in response to which a "flexible" property rights concept appears to be more appropriate than intransigent exclusionary entitlements.

In other words, if the property rights in platforms are conceived of as flexible, they can best serve the different social functions the platform has. This insight would have to be extrapolated into a more general "property model for networks" which takes account of the fact that network property is "located" in a variety of social processes: competition, innovation, communication, and others. In this respect, platform property is multi-functional. A manifestation of this is the involvement of the named different sets of law, each of which might be seen as representing peculiar types of rationales corresponding to the peculiarities of the social processes they are structuring.

The envisaged adjustments of central legal institutions indicate a co-evolution of architectures and institutions. Constitutional law plays an important role in this process.

For example, the design of a comprehensive access regime for networks composed of the contributions from different sets of law would have to be in accordance with the protection the constitution provides for certain values. In some respects, this would indeed be a "constitutionalization of technology law,"[222] because it is constitutional law that is responsible for the ultimate resolution of possible conflicts between the values involved.

In such an engagement of constitutional law, the First Amendment operates as a kind of first among equals. First, speech is a central value not just for communication networks which transmit speech by their very definition, but also for virtual networks themselves. They often build around dominant standards in software, which can also merit First Amendment protection, although the scope of such protection is not yet fully explored.[223] Second, the First Amendment seems able to deal with the fact that the process of designing legal institutions becomes self-reflective when applied to the technological infrastructure for speech, insofar as shaping this infrastructure means determining the possibilities for free speech. Here, we are not dealing with the protection of any right to free

222 *See* Mark A. Lemley, *The Constitutionalization of Technology Law*, 15 BERKELEY TECH. L.J. 529, 534 (2000) (using the phrase differently in his critique of the increase of constitutional review of technology law due to expanded regulatory efforts of congress in this field).

223 *See* Universal City Studios v. Reimerdes, 273 F.3d 429, 445-53 (2d Cir. 2001).

speech, but with ensuring the *conditions* for exerting the right to free speech.

In this last sense, we might actually need not just an "environmentalism for the net,"[224] but an environmentalism for the *nets*, which would be sensitive to the many functional dimensions of networks in layered systems and the fact that architectural design of one layer can affect the conditions of evolution in adjacent layers.[225] The way in which this approach would proceed resembles the method of "constitutional economics" which inquires into the relation between the order of rules and the order of actions that result from the adaptive behavior of individual agents within those rules in order to inform about what kind of rules may serve the common constitutional interests best.[226] "Constitutional architecture," by contrast, would try to determine how constitutional values are promoted in the interplay of institutional design and technological architecture.

III. DIGITALIZATION OF INFORMATION AND DIGITAL RIGHTS MANAGEMENT

A. SHIFTING ISSUES ON DRM

224 *See* Boyle, *supra* note 3 (demanding a comprehensive political economy of intellectual property in the age of digitalization and the Internet).

225 Just as we must conceive of ourselves as part of an "ecosystem" and recognize that its preservation as a functioning whole ensures the conditions of our life.

226 *See* Wolfgang Kerber & Viktor Vanberg, *Constitutional Aspects of Party Autonomy and Its Limits: The Perspective of Constitutional Economics*, *in* PART AUTONOMY AND THE ROLE OF INFORMATION IN THE INTERNAL MARKET 50-53 (Grundmann et al., eds., 2001).

Digital Rights Management[227] (DRM) systems[228] seem to represent an effective model for distributing information and creative content in the "digital ecosystem." Due to their peculiar role, these systems receive recognition and protection both at the national and the international/conventional level.[229] Several commentators have

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227 In its most general form, a Digital Rights Management system is an automated system whose technology is designed to govern the users' behaviors with regard to certain content. From a technical point of view, such a system might be characterized in different ways, for example, "how" it protects, "what" it protects and "where" it protects. Regarding the "how," a DRM may consist of a system essentially designed to impede certain behavior over the content. Following the new Chapter 12 of Titled 17 of U.S. Code, added in 1998 by the Digital Millennium Copyright Act, it is possible to distinguish between "access control" measures that allow the DRM to function as a conditional access system and "rights controls" measures that allow the user that has obtained the access to undertake certain uses on it. DRM systems may enforce rules either through "rights control" or "access control" measures by different degrees of complexity. For example, a DRM may take the form of a subscription service to a database, charging by hour or month, or it may have several delivery options such as: start and expiration times ("use computer program for one hour," or "play on these three hosts"); limits on the number of times a file can be played ("play once"); or regulations of certain behaviors, for example copying the file to a CD or portable device. In such instances, a range of technologies are available to identify the legitimate user and to allow him or her to enjoy the digital work according to certain rules. DRM systems potentially allow a "super-distribution" of the digital works, rendering information providers able "to market documents that disallow certain types of uses (e.g., copying) and provide continuing revenue (e.g., charging 2 [cents] per access)." Regarding "what" is protected, a DRM may be designed to protect personal information (e.g., medical or financial data), corporate information (e.g., legal or business documents), or commercial content (e.g. copyrighted material or other non copyrightable information). From the perspective of the "where" such a system would operate, it is possible to distinguish technologies that are "hardware based," hybrid "software/hardware" based, and "software (and/or online)" based.

228 The difficulty in defining the breadth of the content that might be considered characteristic of such systems turns on the difficulty of finding an agreement in their name. Some names specifically characterize the "what" as "Electronic Copyright Management" (ECMS), "Copyright Management Systems" (CMS), "Intellectual Property Rights Management" (IPRM); other definitions are more "neutral" referring to the content as "Automated Rights Management" (ARM), or "Electronic Rights Management Systems" (ERMS) or the more common Digital Rights Management (DRM). On the inadequateness of the expression "DRM," see Pamela Samuelson, *Digital Rights Management {and, or, vs.} the Law*, 46-4 COMMUNICATIONS OF THE ACM 41, Apr. 2003, who points out that "[g]iven that DRM permits content owners to exercise far more control over uses of copyrighted works than copyright law provides, the moniker 'DRM' is a misnomer." *Id.* at 42. It is also to be noted that Lawrence Lessig distinguishes from (or within) DRM, the "DRE" as Digital Rights Expression, whose function would be to "express" rights rather than enforcing them. *See generally* Creative Commons, *at* http://creativecommons.org (extending the principles of the GPL license to creative works) (last visited Apr. 19, 2004).

229 A general legal status of DRM has been recognized by the WIPO Copyright Treaty of 1996, and by the thirty-nine nations that are parties to that treaty. World Intellectual Property Organization Copyright Treaty, Dec. 20, 1996,

nevertheless pointed out how such systems may inevitably lead to a "trade off" between the ability to "control" and a fundamental doctrine of copyright law as "fair use."[230] Under this model of distribution (and regulation), users might be unable to enjoy the same amount of freedom that copyright law traditionally provides them for the very reason that it protects the copyright ownership: "to promote the Progress of Science and useful Arts."[231]

We consider DRM to be enforcement systems that at the existing stage of evolution of the regulative scenario carry a peculiar character of imposition. On the one hand, this model of enforcement leads to the creation of "private" legal sub-systems; on the other, the nature of the digital enforcement may lead the courts and the legislature to shift toward a more propertized model of copyright law,

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36 I.L.M. 65 (1997). Art. 11 of the Treaty states, "Contracting Parties shall provide adequate legal protection and effective legal remedies against the circumvention of effective technological measures that are used by authors in connection with the exercise of their rights under this Treaty or the Berne Convention and that restrict acts, in respect of their works, which are not authorized by the authors concerned or permitted by law." *Id.* at 71. Identical language characterizes the WIPO Performances and Phonograms Treaty, Dec. 20 1996, 36 I.L.M. 76, 86, art. 18 (1997), by replacing "authors" with "performers and producers of phonograms." A legal "reinforcement" for technological measures is also contained in the Digital Millennium Copyright Act, Pub. L. No. 105-304, 112 Stat. 2860 (codified at 17 U.S.C. § 1201) (1998). A similar reference is contained in the European Parliament and Council Directive 2001/29/EC on the Harmonisation of Certain Aspects of Copyright and Related Rights in the Information Society. Council Directive 2001/29/EC, 2001 O.J. (L 167) 10-19. Article 6.3 of the Directive defines such measures: "For the purposes of this Directive, the expression 'technological measures' means any technology, device or component that, in the normal course of its operation, is designed to prevent or restrict acts, in respect of works or other subject-matter, which are not authorised by the rightholder of any copyright or any right related to copyright as provided for by law or the sui generis right provided for in Chapter III of Directive 96/9/EC." *See also* EU COMMISSION STAFF, DIGITAL RIGHTS: BACKGROUND, SYSTEMS, ASSESSMENT, (Working Paper, 2002), *available at* http://europa.eu.int/information_society/topics/multi/digital_rights/doc/workshop2002/drm_workingdoc.pdf. For a discussion of the legislative origins of DRM systems, see Julie E. Cohen, *Some Reflections on Copyright Management Systems and Laws Designed to Protect Them*, 12 BERKELEY TECH. L.J. 161 (1997).

230 Dan L. Burk & Julie E. Cohen, *Fair Use Infrastructure for Rights Management Systems*, 15 HARV. J. LAW & TECH. 41, 48 (2001) (stating that the control allowed by DRM "will allow copyright owners to appropriate far more protection than copyright law now provides"). Fred von Lohmann considers Digital Rights Management intrinsically inconsistent with the fair use doctrine stating that "it is plain that DRM technologies, backed by laws like the DMCA, pose a serious potential threat to fair use. While technical refinements may address or minimize some of the social costs that stem from an erosion of fair use, it is unlikely that they will entirely resolve the tension." Fred von Lohmann, *Fair Use and Digital Rights Management: Preliminary Thoughts on the (Irreconcilable?) Tension Between Them*, Electronic Frontier Foundation, *at* http://www.eff.org/IP/DRM/fair_use_and_drm.html (last visited Feb. 28 2004).

231 U.S. CONST. art. I, § 8, cl. 8.

where information would become a mere commodity. We will refer to the former phenomenon as "Privatization of Law" and to the latter as "Propertization of Information." Nevertheless, we argue that the character of imposition is contingent with respect to DRM and therefore it may be possible to remove it by reshaping the legislation in a way that would preserve users' rights "within" the DRM model. In this Part of the paper we investigate the way such imposition takes place. Nevertheless, aside from the matter of possible regression to a system of imposition and the discussion over the solutions to it, what the DRM model more structurally presents is the shifting of content regulation – and possibly of the legal system – to more complex and unsystematic relations between private will and public sovereignty, that is between who creates the legal constraint and who enforces it. This not-necessarily negative outcome seems to be inevitable as it depends on the "digitalization of information" and on the capability of the global society to rely on what might be described as a "juridical DNA.".

B. DRM AS SYSTEM ENFORCING *(IL?)*LEGAL RULES

The rules and behaviors imposed on the user by a DRM system may affect the individual in several ways; they affect the user's relation with both "personal information,"[232] and "non-personal information." With regard to "personal information,", DRM may pose a threat to users' privacy rights not only in the sense of violating a condition of "inaccessibility" – by constraining behaviors that take place in "private places" – but also in the sense of recording the activity of intellectual exploration[233] that occurs under such conditions.[234] With respect to "non-personal information," DRM may be used to control uncopyrightable information and materials in

232 Characterizing the relation of an individual with personal information is the object of vast debate. The debate is outside the scope of this work. It has to be noted that such a relation can be imagined in a series of forms. For the analysis of such relation, in particular for an analysis of the private property approach, see Pamela Samuelson, *Privacy as Intellectual Property?*, 52 STAN. L. REV. 1125 (2000).

233 "DRM technologies that monitor user behaviors create records of intellectual consumption. Indirectly, then, they create records of intellectual exploration, one of the most personal and private of activities." Julie E. Cohen, *DRM and Privacy*, 18 BERKELEY TECH. L.J. 575, 585 (2003); *see also* Julie E. Cohen, *A Right to Read Anonymously: A Closer Look at "Copyright Management" in Cyberspace*, 28 CONN. L. REV. 981 (1996).

234 As Julie Cohen points out, privacy is "not only a condition of (relative) inaccessibility, but also a zone of noninterference with individual choice." Cohen, *DRM and Privacy*, *supra* note 233, at 582.

public domain.[235] The ability to extend control over any use of the contents may also threaten fair use.[236] The fair use doctrine,[237] probably the most important exception to the copyright holder's rights[238] – and the most troublesome[239] – plays a fundamental role in mediating between copyright law and the freedom of expression which is constitutionally protected by the First Amendment.[240] Consistent with the principle of freedom of expression, fair use provides a breathing space for criticism, commentary, or parody[241] with respect to the works that fall within the realm of the copyright owner. Consistent with the mirror principle of freedom to access information, it also represents a means of separating the control of copyright ownership and the free use of the copyrighted material. For example, some courts have referred to fair use to justify the temporary and unauthorized copying of computer programs in order to

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235 "Public domain [is] a commons that includes those aspects of copyrighted works which copyright does not protect . . . ." Jessica Litman, *The Public Domain*, 39 EMORY L.J. 965, 968 (1990); *see* Yochai Benkler, *Free as the Air to Common Use: First Amendment Constraints on Enclosure of the Public Domain*, 74 N.Y.U. L. REV. 354 (1999) (describing the relationship between public domain and the First Amendment); Dan L. Burk, *Anticircumvention Misuse*, 50 UCLA L. REV. 1095, 1108 (noting that the limited exceptions permitting the circumvention of access control do not contain a general exception that would allow extraction of facts from a copyrightable database arrangement, and and argues that this behavior could only be covered by the "enormously creative judicial construction" of the exception allowing circumvention to extract unprotectable elements of computer programs in reverse engineering); Pamela Samuelson, *Mapping the Digital Public Domain: Threats and Opportunities*, 66 LAW & CONTEMP. PROBS. (2002).

236 The line between public domain and fair use might be drawn by saying that where public domain covers uses that are unprotectable in principle, fair use is appropriate to those cases where "the law refuses an owner of copyright a remedy, even though the work and the aspect of it used are protectible in principle." Benkler, *supra* note 235, at 361.

237 *See* 17 U.S.C. § 107 (2003).

238 *See* Burk, *supra* note 235.

239 Judge Learned Hand described fair use doctrine as "the most troublesome in the whole law of copyright . . . ." Dellar v. Samuel Goldwyn, Inc., 104 F.2d 661, 662 (2d Cir. 1939).

240 For the relationship between free speech and fair use, see L. Ray Patterson, *Free Speech, Copyright, and Fair Use*, 40 VAND. L. REV. 1, 3 (1987); Harry N. Rosenfield, *The Constitutional Dimensions of Fair Use in Copyright Law*, 50 NOTRE DAME L. REV. 790, 796-98 (1975); Melville B. Nimmer, *Does Copyright Abridge the First Amendment Guarantees of Free Speech and Press?*, 17 UCLA L. REV. 1180, 1190 (1970). For an analysis on the European legal systems, see P. Bernt Hugenholtz, *Copyright and Freedom of Expression in Europe*, *in* INNOVATION POLICY IN AN INFORMATION AGE (Rochelle Cooper Dreyfuss et al., eds.) (2001).

241 *See* Richard A. Posner, *When is Parody Fair Use?*, 21 J. LEGAL STUD. 67 (1992); Robert P. Merges, *Are You Making Fun of Me?: Notes on Market Failure and the Parody Defense in Copyright*, 21 AIPLA Q.J. 305 (1993). The role of fair use to promote parody was emphasized in *Campbell v. Acuff-Rose*, 510 U.S. 569 (1994); *see also* Burk & Cohen, *supra* note 230, at 43-45.

undertake reverse engineering.[242] It also shields actions that are taken by users of a copyrighted work in their private spaces, such as time and space shifting.[243] An example of such derogation is the CSS system that prevents the person who legally acquired a DVD from copying it.[244]

DRM may still pose a threat to fair use's "cousins, such as first sale or limited term."[245] The first sale doctrine[246] establishes the right to dispose of one's copy of a work after its "first sale," without requiring the copyright owner's approval, and "rests on the belief that a copyright owner has no cognizable interest in a broad range of post-purchase user activities or in the spaces where they occur."[247] Finally,

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242 *See e.g.*, Sony Computer Entm't, Inc. v. Connectix Corp., 203 F.3d 596, 602-08 (9th Cir. 2000); DSC Communications Corp. v. DGI Techs., 81 F.3d 597, 601 (5th Cir. 1996); *see also* Pamela Samuelson & Suzanne Scotchmer, *The Law & Economics of Reverse Engineering*, 111 YALE L.J. 1575 (2002).

243 *See* Cohen, *DRM and Privacy*, *supra* note 233.

244 *See* Universal City Studios, Inc., v. Corley, 273 F.3d 429 (2d Cir. 2001).

245 von Lohmann, *supra* note 230; *see also* Cohen, *supra* note 233. The application of first sale doctrine is highly problematic in the digital environment. For an early consideration of the effects of the Clinton Administration White Paper "Intellectual Property and the National Information Infrastructure," see Pamela Samuelson, *The Copyright Grab*, 4.01 WIRED, Jan. 1996; *see also* Mark A. Lemley, *Copyright Owners' Rights and Users' Privileges on the Internet: Dealing with Overlapping Copyrights on the Internet*, 22 DAYTON L. REV. 547 (1997). European Council Directive 2001/29/EC expressly addresses the problem of excluding the application of the doctrine to the Information Society: Recital 29 states that:

> The question of exhaustion does not arise in the case of services and on-line services in particular. This also applies with regard to a material copy of a work or other subject-matter made by a user of such a service with the consent of the rightholder. Therefore, the same applies to rental and lending of the original and copies of works or other subject-matter which are services by nature. Unlike CD-ROM or CD-I, where the intellectual property is incorporated in a material medium, namely an item of goods, every on-line service is in fact an act which should be subject to authorisation where the copyright or related right so provides.

2001 O.J. (L 167) 12. Quite interestingly, recently proposed legislation would address such problem by making the enjoyment of the first sale doctrine conditional on the elements that traditionally justify its application. The "Digital Choice and Freedom Act of 2002," submitted by Reps. Zoe Lofgren (D-CA) and Mike Honda (D-CA), addresses this issue stating that "[s]ection 109 of title 17, United States Code, is amended by adding at the end the following: '(f) The privileges prescribed by subsections (a) and (c) apply where the owner of a particular copy or phonorecord of a work in a digital or other nonanalog format, or any person authorized by such owner, sells or otherwise disposes of the work by means of a transmission to a single recipient, if the owner does not retain his or her copy or phonorecord in a retrievable form and the work is sold or otherwise disposed of in its original format.'." H.R. 5522, 107th Cong. §4 (2002).

246 17 U.S.C. § 109(a) (2003).

247 Cohen, *DRM and Privacy*, *supra* note 233.

"DRM can be used to compel users to view content they would prefer to avoid (such as commercials and FBI warning notices), thus exceeding copyright's bounds."[248]

Given that DRM systems are capable of affecting some traditional copyright law doctrines,[249] before assessing in more detail the threat that DRM poses for the boundaries of such law, it is necessary to choose the method by which those constraints should be analyzed. One possible approach might be to consider them from a meta-legal perspective. In this context, "meta-legal" describes the view of an observer standing outside the "lenses" of the law who is able to see how the law influences individual behavior compared to other constraints such as market, architecture and technology. We will use "legal" to describe the perspective of an observer who always looks at phenomena from the point of view of the law. From the "meta-legal" perspective, a DRM system may be described as consisting of the "intersection of technology, law and commercial licenses."[250] The technological protection written and carried out by anti-circumvention rules is accompanied by a contractual protection.[251] A contract may be used to protect the content – or the security of the DRM system itself – in the form o licenses resembling the shrink-wrap licenses used for computer software. The technological and the contractual layers may be accompanied by a further protection in the form of technology licenses.[252] It is important to note that the first two layers of protection (technology and contracts) are further enforced by law and technology: the technology is protected by the re-enforcement rules of the Anti-Circumvention provisions.[253]

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248 *See* Pamela Samuelson, *supra* note 228.

249 As some commentators have noted, the term fair use may be misleading because it implies that the uses not covered by this doctrine are unfair. As Julie Cohen points out, "[f]air use and other copyright limitations are not outer limits on permissible uses of copyrighted works and/or the things embodying them. They are simply outer limits on a copyright owner's statutory rights." Cohen, *DRM and Privacy*, *supra* note 233, at 594 n.52.

250 Dean S. Marks & Bruce H. Turnbull, *Technical Protection Measures: The Intersection of Technology, Law and Commercial Licenses*, 22 EUR. INTELL. PROP. REV. 198, 204 (2000).

251 Even if the contractualization of copyright law has not been object of wide debate in Europe some landmarks are offered by EC Directives. *See infra* note 276.

252 For the strategic use of such licenses, see *infra* note 294.

253 For an analysis of the DRM systems based on this approach, see Stefan Bechtold, *Digital Rights Management in the United States and Europe*, 52 AM. J. OF COMP. LAW (forthcoming 2004); and *The Present and Future of Digital Rights Management – Musings on Emerging Legal Problems*, *in* DIGITAL RIGHTS MANAGEMENT – TECHNOLOGICAL, ECONOMIC, LEGAL AND POLITICAL ASPECTS, (Eberhard Becker et al. eds., forthcoming summer 2003), *available at*

Consistent with this meta-legal approach, the "*lex informatica*"[254] embedded in the DRM may be seen as a unique system of "alternative" rules to copyright law: rules which are embedded in a technology that replaces the law[255] in its typical power to constrain behavior. The supporters of such alternative technological rules might regard DRM as positive and might support[256] and require them to be mandated in all digital media devices.[257] Others, however, may regard such systems as creating a not auspicial "alternative" copyright law and may shift toward other models of the protection and management of digital works that seem more respectful of the copyright model.[258] Even within the metalegal approach, it is undoubtedly possible to recognize attempts at mediation where, given the DRM model, further users' protections are considered possible by initiatives undertaken at each metalegal layer.[259] Nevertheless, a "legal approach" seems quite

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http://www.jura.uni-tuebingen.de/bechtold/pub/2003/Future_DRM.pdf [hereinafter Bechtold, *The Present and Future*].

254 *See* WILLIAM J. MITCHELL, CITY OF BITS: SPACE, PLACE, AND THE INFOBAHN (1995); Ethan Katsh, *Software Worlds and the First Amendment: Virtual Doorkeepers in Cyberspace*, 1996 U. CHI. LEGAL F. 335, 338 (1996); Joel R. Reidenberg, *Lex Informatica: The Formulation of Information Policy Rules Through Technology*, 76 TEX. L. REV. 553 (1998); ANDREW L. SHAPIRO & RICHARD C. LEONE, THE CONTROL REVOLUTION: HOW THE INTERNET IS PUTTING INDIVIDUALS IN CHARGE AND CHANGING THE WORLD WE KNOW (1999); LAWRENCE LESSIG, CODE AND OTHER LAWS OF CYBERSPACE (1999). According to Tom W. Bell the "[o]wners of conventional sorts of property do not rely on the law alone to protect their assets. They also deploy fences, locks, and guards. Automated rights management provides the owners of intangible assets with similar defensive mechanisms, albeit ones built into computer hardware and software and implemented via firewalls, encryption, and passwords." Tom W. Bell, *Fair Use vs. Fared Use: The Impact of Automated Rights Management on Copyright's Fair Use Doctrine*, 76 N.C. L. REV. 557, 564 (1998).

255 "The development of rights management systems powerfully demonstrates the ability of technology to regulate behavior." Burk & Cohen, *supra* note 230, at 50.

256 *See* Derek Slater, *Valenti's Views*, HARV. POL. REV., Jan. 25, 2003; *see also WIPO One Year Later: Assessing Consumer Access to Digital Entertainment on the Internet and Other Media: Hearing Before the Subcomm. on Telecommunications, Trade, and Consumer Protection*, 106th Cong. 10-16 (1999) (statement of Jack Valenti, Motion Picture Assoc. of Am.).

257 *See* Pamela Samuelson, *supra* note 228. The general use of DRM might be the result either of standard-setting processes or legislation. An example of the former was the agreements reached between motion picture and consumer electronics industries about the application of CSS. An example of the latter is Sen. Fritz Holling (D-SC)'s Consumer Broadband and Digital Television Promotion Act of 2002, S. 2048, 107th Cong. (2002), which gave the copyright industries, the consumers' representatives, and makers of digital media devices twelve months to agree upon a DRM standard. Alternatively the bill gives the FCC the power to require DRM technology be added to consumers electronics devices.

258 Alternative solutions to the DRM model include the levy system and the compulsory licenses model.

259 *See* Bechtold, *The Present and Future*, *supra* note 253.

appealing. First, it would clarify the scenario and would be more adequate to providing solutions. Second, by not taking for granted the substitution between the technical code and the juridical code, it would make it easier to distinguish, in content regulation, between a contingent matter of imposition and the structural matter of "Juridical Particularism."

The idea that technology is able to replace the law ("code as code") and not just its enforcement function ("code as enforcement") is undoubtedly based on reasonable considerations. First, most of the problems that digital technology creates arise from the way technology is written. Second, the way certain laws are written, anti-circumvention provisions for example, renders the writer of the technology a writer of legal rules ("para-copyright" rules). Here we argue that the process by which technology replaces the law ("code as code") is a "fact." Technologists have a peculiar power to write into the DRM systems rules that constrain users' behaviors. As a matter of fact, the "code as code" approach is well suited for describing the way the system as a whole is evolving. Nevertheless, this "replacement" is exogenous to the nature of a DRM system and possibly exogenous to the phenomena which characterize the "information society."[260] The substitution may be viewed as a contingent result of the way rules are enforced by digital systems. The endogenous element is the peculiarity of the enforcement. It is because of this peculiar enforcement that, absent sufficient limits on the designers of the enforcement, the "technical code" begins to become the "juridical code." Certainly when an "enforcement system" is left free to act it may take over the legislative function: "[w]here technological constraints substitute for legal constraints, control over the design of information rights is shifted into the hands of private parties, who may or may not honor the public policies that animate public access doctrines such as fair use."[261] If it is true that "[m]uch as physical barriers and spatial relations constrain behavior in actual space, technical standards constrain behavior in cyberspace,"[262] the types of constraints that the code represents do not substitute for the law but its enforcement.

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260 The expression "Information Society" is used to describe the Internet in the laws of European Union. The expression "Information Infrastructure" is more successful in the U.S. legal documents. We might use Information Society as an ideal target characterized by a typically "human" design. As the most "human" constraint is the law, the "Information Society" is an equilibrium where technological constraints are governed by law, in part with the mechanisms described in this work: by requiring an overlapping between contractual or public legal rules and technological rules, and by embedding "imperfections."

261 Burk & Cohen, *supra* note 230, at 51.

262 Burk & Cohen, *supra* note 230, at 51.

The peculiarity of the digital technology (or we might say, the peculiarity of the digitalization)[263] consists in the perfection of the enforcement that it provides and the consequent capability of combining the "super-diffusion" of the digital technology with the "super-distribution" allowed by the digital enforcement. Unlike the traditional "heteronomous"[264] mechanical enforcement systems, where the enforcement layer is put over the object of regulation and can be distinguished from it, the "non-heteronomic" digital enforcement is of the same nature as the object of regulation – the digital work – and merges with it. This peculiarity affects only the nature of enforcement and is in itself neutral with respect to the type of rules that are enforced. The merger between the rule enforced and the object has an analogue in nature in the structure of DNA. The rules are perfectly enforced as the language of DNA is embedded in the object in which such rules are to be enforced. Due to this merger, the designer of the system has a peculiar power: choosing these rules grants a peculiar control over the reality that is regulated. The analogy of digital enforcement as a "juridical DNA" serves also to distinguish the perfection of the enforcement from the possibility of circumvention.[265]

The fact that this enforcement system becomes a "*lex informatica*" is an exogenous element and rather than a starting point of view, it may be regarded as a possibly illegal effect. If the rules written in the digital DNA lay outside the boundaries of the law – the law created by institutions established in the constitution or decided, within certain boundaries, by the freedom of contract – they are illegal.

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263 The aspect looked at in this work is digital technology as "enforcement." Digital technology as a system of enforcement – or digitalisation – should be distinguished from digital technology with regard to historical design of the internet. These prongs of digital technology give rise to different and possibly opposite tendencies.

264 We consider heteronomous mechanical enforcement systems in which the enforcement is not merged with the object regulated. An heteronomous system enforcing private rules is like a newspaper vending machine, enforcing contractual rules over an object, the newspaper, whose identity is clearly separated from the system. Heteronomous systems which enforce public rules are, for example, certain types of security controls that apply rules over an object. Non-heteronomous enforcement systems are ones in which the enforcement system merges with the object of regulation. Even if the perception of the creative works is different, digital enforcement and digital works are written in the same language. As described later, we offer human DNA as an example of a non-heteronomous enforcement system.

265 Where the enforcement is perfect in its capacity to apply rules, it is highly imperfect in the sense of being technically undefeatable. Such differential imperfection is the best argument for claiming that a DRM model of digital works management is unworkable. *See* Peter Biddle et al., *The Darknet and the Future of Content Distribution*, 2002 ACM Workshop on Digital Rights Management (2002), *available at* http://crypto.stanford.edu/DRM2002/darknet5.doc.

If the "*lex informatica*" does not respect such legal framework it is an illegal rule. The substitution between law and "*lex informatica*" is therefore the "result" of a contingent shifting. The reason for such a shift can be found in the enforcement, both in the peculiar enforcement provided by digital technology and in the rules that re-enforce such technology. When technological enforcement or those legal rules produce effects that are inconsistent with the legal system, they are a form of illegal enforcement or illegal rules. If technology has replaced the law, this replacement should be partially[266] regarded as a usurpation, rather than an intrinsic and unavoidable feature of this environment.

In our analysis, we describe the DRM machinery as a technological system enforcing *(il?)*legal rules. Like a traditional mechanical system, DRM may enforce either copyright law[267] or other rules written in express clauses and expressly accepted by the user,[268] or legal rules contained in implied contractual clauses and impliedly accepted by the user[269] (legal rules).[270] However, these systems may also enforce other rules that haven't been even impliedly accepted by users (illegal rules).[271] It is from the peculiarity of such enforcement that the privatization of law and propertization of information arises.

C. DRM AND PRIVATIZATION OF THE LAW

By "privatization of the law" we refer to the peculiar phenomenon resulting from the way DRM's enforce the rules derogating copyright law. On one side, the effects of the derogative rules that have an (express or implied) contractual basis spill out of the traditional privity of contract due to the superdiffusion of the DRM systems. On the other, the rules that are not even implicitly agreed upon by the user can be unilaterally imposed by the technical systems due to the re-enforcement of the Anti-Circumvention provisions.

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266 In fact, as it has been noted, there are aspects of such substitution that are positive: the shifting of enforcement into the technology makes it possible to apply "legal" rules.

267 *See* Pamela Samuelson, *supra* note 228, at 42 (stating that DRM is said to be a "mechanism for enforcing copyright," such as where it is able to prevent the violations of copyright law, yet it can also easily prevent users from undertaking tasks that should be allowed under copyright law).

268 A contract or a license might be provided and signed by the user while acquiring the DRM.

269 The user pursuing content with a commonly known DRM system might be seen as accepting an implied contractual clause derogating copyright law.

270 These rules are still derogating the copyright law.

271 For example a rule, completely unknown to the buyer, impeding the use of the content by a consumer electronic device of another state.

1. DRM ENFORCING "EXPRESS" CONTRACTUAL DEROGATIONS TO COPYRIGHT LAW

The rules "derogating" copyright law[272] may arise from a usage contracts[273] agreed upon by the user at the moment of pursuing the technology embedding the DRM, or while accessing the digital work. The contractual derogations enforced by DRM may take as a model the shrink wrap license.[274]

The law is silent about whether and when parties may contract around rights and limitations provided by copyright law. The validity of contractual derogations of copyright law, has been object of a much discussion in the U.S. legal system,[275] and has led to some legislative initiatives in the European Union.[276] Further doubts over the validity

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272 Pamela Samuelson underlines that as "DRM permits content owners to exercise far more control over uses of copyrighted works than copyright law provides . . . . These technologies are not really about the management of digital 'rights' but rather about management of certain 'permissions' to do X, Y, or Z with digital information." Samuelson, *supra* note 228, at 42.

273 Such a contract binding the user to the use of the content, might provide a contractual basis also for the protection of the system in itself, for example, forbidding the user from tampering with its security.

274 Licensing has traditionally constituted a way for copyright owners to avoid the limits that copyright law imposes over their realm. For example, the first sale doctrine does not apply where the copy of work is leased rather than sold. *See* David Nimmer et al., *The Metamorphosis of Contract into Expand*, 87 CAL. L. REV. 17 (1999). Further, a licensing agreement may require the user to renounce a right to fair use. *See* Burk & Cohen, *supra* note 230.

275 *See infra*, notes 277-78.

276 In Europe this debate is much less developed probably due to the different role and nature of the "exemptions to copyright law." Within the legislation of the European Union there are, nevertheless, some important landmarks affecting the digital environment. In particular European legislature has been the first to enact copyright limitations of a mandatory nature. In the highly harmonized area of software and database, the exemptions are set forth in closed lists and most of them cannot be contracted out. The Computer Programs Directive lays down a list of mandatory exceptions. Council Directive 91/250/EEC, 1991 O.J. (L 122) 42. Article 5(2) of the Directive states that "[t]he making of a back-up copy by a person having the right to use the computer program may not be prevented by contract insofar as it is necessary for that use." *Id.* Article 9(1) and Article 5(3) state that the observing, studying or testing of a computer program may not be contractually restricted. Similarly mandatory are the exemptions covering the running of a program and error correction, Article 5(1), and decompilation (reverse engineering). Article 9(1), Article 6, and Recital 17. A similar outcome is provided by the Database Directive, containing mandatory exemptions. Council Directive 96/9/EC, art. 15, 1996 O.J. (L 77) 1; *see also* art. 6(1); art. 8. Exceptions set forth in the Copyright in Information Society Directive are not of such an imperative nature. Directive 2001/29/CE, 2001 O.J. (L 167) 10-19. In the Directive, not only are the exceptions to be voluntary adopted by Member States (leaving open the possible of a totally privatized model of copyright law), but also no provision states that they are mandatory once adopted. In particular, Recital 45 states that "[t]he exceptions and

of such derogations are raised when the agreement is "obtained" by a shrink wrap license. At first, U.S. courts denounced such licenses.[277] Recent cases, however,[278] have upheld their validity[279] and the "Uniform Computer Information Transaction Act" (UCITA) – whose application depends on a voluntary decision by each State to amend UCC with a new article 2B – seems to adopt such model[280] as a general model for exchanging content.[281]

One of the strongest arguments against the validity of these contracts is based on the application of the Constitutional doctrine of preemption: state contract law may not undermine federal copyright law.[282] The best argument against such approach has been built on the principle of the privity of contract, but it is the maintenance of this latter argument to be troublesome within the DRM ecosystem. In *ProCD*, Judge Easterbrook stated that:

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limitations . . . should not, however, prevent the definition of contractual relations designed to ensure fair compensation for the rightsholders insofar as permitted by national law." *Id.* at 14.

277 Step-Saver Data Systems, Inc. v. Wyse Technology, 939 F.2d 91, 98-100 (3rd Cir. 1991); Arizona Retail Systems, Inc. v. Software Link, Inc., 831 F. Supp. 759, 764-66; Novell, Inc. v. Network Trade Center, Inc., 25 F. Supp. 2d 1218 (D. Utah 1997); Morgan Laboratories, Inc. v. Micro Data Base Systems, Inc., 41 U.S.P.Q.2d 1850 (N.D. Cal. 1997).

278 As an example of private contracts unaffected by preemption when derogating copyright law, see *American Airlines, Inc. v. Wolens*, 513 U.S. 219 (1995). *See also* Fantastic Fakes, Inc. v. Pickwick Int'l, Inc., 661 F.2d 479 (5th Cir. 1981). On the validity of Shrink-wrap licenses, see *ProCD, Inc., v. Zeidenberg*, 86 F.3d 1447, 1450-53 (7th Cir. 1996).

279 For a critique of the "sanctity of private property and freedom of contract, the sharply delimited role of public policy in shaping private transactions," see Julie E. Cohen, *Lochner in Cyberspace: The New Economic Orthodoxy of "Rights Management,"* 97 MICH. L. REV. 462, 464 (1998) (also discussing what we have referred to as the "propertization" of information).

280 For the debate over the relationship between contract and copyright law, with particular reference to the proposed article 2B of the UCC, see Nimmer et al., *supra* note 274; Mark A. Lemley, *Beyond Preemption: The Law and Policy of Intellectual Property Licensing*, 87 CAL. L. REV. 111, 119-21 (1999); Charles R. McManis, *The Privatization (or "Shrink-Wrapping") of American Copyright Law*, 87 CAL. L. REV. 173 (1999); Pamela Samuelson & Kurt Opsah, *Licensing Information in the Global Information Market: Freedom of Contract Meets Public Policy*, 21 EUR. INTELL. PROP. REV. 386 (1999); Pamela Samuelson, *Intellectual Property and Contract Law for The Information Age: The Impact of Article 2B of the Uniform Commercial Code on the Future of Information and Commerce*, 87 CAL. L. REV. 1 (1999); J.H. Reichman & Jonathan A. Franklin, *Privately Legislated Intellectual Property Rights: Reconciling Freedom of Contract with Public Good Uses of Information*, 147 U. PA. L. REV. 875 (1999).

281 For a possible application of the article 2B model to personal information, see Samuelson, *supra* note 232.

282 17 U.S.C. § 301(a) (2003).

> 301(a) preempts any 'legal or equitable rights [under state law] that are equivalent to any of the exclusive rights within the general scope of copyright as specified by section 106 in works of authorship that are fixed in a tangible medium of expression and come within the subject matter of copyright as specified by sections 102 and 103' . . . . But are rights created by contract 'equivalent to any of the exclusive rights within the general scope of copyright'? . . . Rights 'equivalent to any of the exclusive rights within the general scope of copyright' are rights established by law – rights that restrict the options of persons who are strangers to the author. . . . A copyright is a right against the world. Contracts, by contrast, generally affect only their parties; strangers may do as they please, so contracts do not create 'exclusive rights.'[283]

Where the validity of such contracts is recognized, it seems to be, even in the words of its supporters, the result of a "case by case" analysis of the nature of the derogation:

> Like the Supreme Court in *Wolens*, we think it prudent to refrain from adopting a rule that anything with the label 'contract' is necessarily outside the preemption clause: the variations and possibilities are too numerous to foresee. *National Car Rental* likewise recognizes the possibility that some applications of the law of contract could interfere with the attainment of national objectives and therefore come within the domain of § 301(a). But general enforcement of shrink-wrap licenses of the kind before us does not create such interference.[284]

The possibility of one contractual party playing a role equivalent to a sort of legislator – and therefore the shifting of the contractual rule toward something "equivalent to any of the exclusive rights within the general scope of copyright"[285] – has been raised by some commentators. They have described how certain types of contractual model (such as standard contract or shrink-wrap licenses) inevitably tend to have an impact on consumers which affects the traditional boundaries of the privity of contract, carrying a character of private legislation. The reason that these contractual derogations carry such "*erga omnes* effect" – resembling an alternative legislation under control of a private party – is that such licenses are unilaterally drawn

283 ProCD, Inc. v. Zeidenberg, 86 F.3d 1447 (7th Cir. 1996).
284 *Id.* at 1453.
285 *Id.* at 1455.

by the copyright owner and their diffusion leads, in certain markets, to a situation where anybody who wants to access a certain type of content must enter into a contractual relationship with that party. Some commentators argue that certain types of contractual derogation to copyright law should be always void,[286] while others ask for a case by case judgment.[287] Robert Merges,[288]concerned that they are not negotiated and particularly widespread in a certain market, has suggested that these derogations should be void when they resemble a kind of private legislation:[289] "[s]tandard form software licensing contracts by virtue of their very uniformity and the immutability – in other words, non-negotiability – of their provisions, have the same generality of scope as the state legislation that is often the target of federal preemption."[290] In certain circumstances, therefore, the contract loses its negotiable nature and is "equivalent to any of the exclusive rights within the general scope of copyright."[291] Moreover, these contracts "have the same effect as offending state legislation: wholesale subversion of an important federal policy."[292]

This criticism – resembling (and referring to) the similar criticism that Friedrich Kessler[293] had for standard contracts – may be useful in the context of Digital Rights Management. These systems, indeed, strengthen those phenomena[294] as the peculiarities of their enforcement make the contractual derogations that they impose spill over the traditional boundaries of the privity of contract. First, the

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286 Robert P. Merges, *Intellectual Property and the Costs of Commercial Exchange: A Review Essay*, 93 MICH. L. REV. 1570, 1612 (1995).

287 Apik Minassian, Comment, *The Death of Copyright: Enforceability of Shrinkwrap Licensing Agreements*, 45 UCLA L. REV. 569, 570 (1998) (arguing that a case-by-case analysis should be undertaken in order to verify whether or not the contract should be preempted).

288 *See supra* note 286.

289 Merges proposes that such contracts might be preempted if their uniformity within an industry would turn them into a form of private legislation.

290 Merges, *supra* note 286, at 1613.

291 *ProCD*, 86 F.3d at 1455.

292 "There is something wrong with the wholesale undermining of a statutory right. I disagree, however, with the implicit premise that the right to reverse engineer is an immutable right, one that a prospective licensee cannot surrender in a transaction. Instead, I believe that preemption should occur only when the practice of contracting away a statutory right has become pervasive and perpetual in a particular industry setting." Merges, *supra* note 286, at 1611; *see* David A. Rice, *Public Goods, Private Contract and Public Policy: Federal Preemption of Software License Prohibitions Against Reverse Engineering*, 53 U. PITT. L. REV. 543 (1992).

293 Friedrich Kessler, *Contracts of Adhesion – Some Thoughts About Freedom of Contract*, 43 COLUM. L. REV. 629 (1943).

294 "[The] paradigm shift resulted from the rise of consumer mass markets decades ago. Technologies for indicating 'consent' online simply underscore what we already know to be true: that in mass markets, the idea of a 'meeting of minds' is little more than a pleasant fiction." Cohen, *DRM and Privacy*, *supra* note 233, at 617 n.86.

super-diffusion is due to the character of the digital technology which allows it to be embedded in content and/or in consumer electronic devices. Second, such diffusion is paralleled by the DRM technology license agreements.[295] The strategic use of the license agreements makes that even if content providers are not involved in the process of producing DRM systems or consumer electronic devices, they make producers of consumer electronic devices to enter into license agreement with DRM manufacturers producing a high level of protection for the contents.[296] Third, even if in order to access certain content in the digital environment the user has to enter into a contractual relation, the contractual relation enforced by the DRM does not exactly express the limitation of the contractual rules, as it would under a typical contractual scenario. Even a user that is not part of that contract would still be bound by such rules because of the protection provided by the Anti-Circumvention provisions. Whereas traditionally a third party was not bound by a shrink wrap license,[297] the third party of a DRM system would be bound by the enforcement of an access control or a merged access/rights control as an effect of the Anti-Circumvention provisions.

Therefore, due to an interaction between the enforcement provided by technology and the re-enforcement provided by the law, even when the contractual rules derogating copyright law can be described as originating from a contract, they seem to have a private[298] legislative effect.

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295 *See* Bechtold, *The Present and Future*, *supra* note 253; *see also* Jonathan Weinberg, *Digital TV, Copy Control, and Public Policy*, 20 CARDOZO ARTS & ENT. L.J. 277 (2002).

296 Such agreements indirectly serve the interests of the content provider in the diffusion of consumer electronic devices which respect their DRM and the rules that they enforce.

297 Even Judge Easterbrook in *ProCD* stated:

> A copyright is a right against the world. Contracts, by contrast, generally affect only their parties; strangers may do as they please, so contracts do not create 'exclusive rights.' Someone who found a copy of SelectPhone (trademark) on the street would not be affected by the shrinkwrap license – though the federal copyright laws of their own force would limit the finder's ability to copy or transmit the application program.

ProCD, 86 F.3d at 1454.

298 On the issue of representation in cyberspace, see John Perry Barlow, *Private Life in Cyberspace*, 34-8 COMMUNICATIONS OF THE ACM 23 (1991).

2. DRM ENFORCING "IMPLIED" CONTRACTUAL DEROGATIONS TO COPYRIGHT LAW

It is still possible to find a DRM enforcing a contractual derogation where contractual clauses may be said to have been implicitly agreed to by the purchaser.[299] The existence of implied derogations is troublesome from two points of view. First, such derogations are characterized by the above-described spill-over effects.[300] Second, it is difficult to draw a line between rules that are implicitly agreed to and known to the consumer, and rules that are not known but still enforced by the technology.

3. DRM ENFORCING "NON-CONTRACTUAL" DEROGATIONS TO CONTRACT LAW

In addition to the effects of the "mass contractualization" of copyright law brought about by the multi-layered DRM enforcement, this technical legal enforcement challenges the equilibrium between copyright and contractual derogations in a more unusual way.[301]

This other phenomenon depends on the impact of Anti-Circumvention provisions. These provisions can be schematised by two intermeddling elements: the object of the ban and the object of the protection.[302] As for the object of the ban, Anti-Circumvention provisions outlaw the act of circumventing technical measures[303] or the trafficking of devices made to circumvent technical measures.[304] As for the object of protection, the technical measure protected by the law can be either an access protection measure or a rights control measure.

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299 For example, in the Boucher Bill, requiring information on CD about rules derogating copyright law DVD, Audio discs and Super Audio CDs are exempted from the labelling requirements because the marketing and packaging of these formats already notify consumers that they are not traditional audio compact discs.

300 *See supra* notes 289-91.

301 For the analysis of the constitutional issues, see Pamela Samuelson, *Intellectual Property and the Digital Economy: Why the Anti-Circumvention Regulations Need to Be Revised*, 14 BERKELEY TECH. L.J. 519 (1999); *Anti-Circumvention Rules Threaten Science*, 293 SCIENCE 2028 (Sept. 14, 2001); Burk & Cohen, *supra* note 230; Dan L. Burk, *Anti-Circumvention Misuse*, *supra* note 235; R. Anthony Reese, *Will Merging Access Controls and Rights Controls Undermine the Structure of Anticircumvention Law?*, 18 BERKELEY TECH. L.J. 619 (2003); Joseph Liu, *The DMCA and the Regulation of Scientific Research*, 18 BERKELEY TECH. L.J. 501 (2003).

302 Such a protection results from a double negation: the rules legally disable what some technology technically tends to disable.

303 17 U.S.C. § 1201(a)(1)(A) (2003).

304 17 U.S.C. §§ 1201(a)(2), (b)(1) (2003).

The interaction between banned behaviors and protected technology is not symmetric. While the trafficking ban protects access control measures and right control measures by nearly identical provisions,[305] the circumvention ban relates only to the circumvention of access controls.[306] In the four boxes of the interaction, the box for the circumvention of right control measure is empty.[307]

The DMCA access control Anti-Circumvention provision does not have a breathing limitation referring to "other legitimate purposes." Rather, the provision is limited by a closed set of exemptions,[308] that does not provide a logic for accommodating unpredicted fair uses[309] and is inadequate to cover exemptions that already exist under copyright law.[310]

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305 It is important to note that "while the basic prohibitions on manufacture of and trafficking in circumvention technologies make no distinction based on the type of control measure being circumvented, certain of the exceptions to those basic prohibitions on devices do distinguish between access controls and rights controls." R. Anthony Reese, *supra* note 301, at 622 n.7.

306 "Subsection 1201(a)(1) differs from both of these anti-trafficking subsections [in Sections 1201(a)(2) and 1201(b)] in that it targets the use of a circumvention technology, not the trafficking in such a technology." Universal City Studios, Inc. v. Corley, 273 F.3d 429, 441 (2d Cir. 2001).

307 The Senate Report on the DMCA explains the absence of a rights-control circumvention ban: "It is anticipated that most acts of circumventing a technological copyright protection measure will occur in the course of conduct which itself implicates the copyright owners[']' rights under title 17. This subsection is not intended in any way to enlarge or diminish those rights. Thus, for example, where a copy control technology is employed to prevent unauthorized reproduction of a work, the circumvention of that technology would not itself be actionable under 1201, but any reproduction of the work that is thereby facilitated would remain subject to the protections embodied in title 17." S. REP. NO. 105-190, at 29 (1998).

308 There are seven exemptions to Section 1201(a)(1)(A): (a) Non-profit "shopping" privilege, (b) legitimate law enforcement/national security, (c) necessary program interoperability, (d) legitimate encryption research, (e) protection of minors toward harmful material, (f) protection against collection of personal data (surveillance without notice), and (g) computer security testing.

309 Such an approach would be better fit to serve the interests of other copyright systems based on a closet rules approach, such as in Europe. It should be noted that even this character is not really correct.

310 The actual design of the exemptions is ill-suited to cover a series of exemptions. *See* Pamela Samuelson, *Intellectual Property and the Digital Economy: Why the Anti-Circumvention Regulations Need to Be Revised*, 14 BERKELEY TECH. L.J. 519 (citing several examples). Among these are the following: the case of a copyright owner who has reason to believe that an encrypted work contained an infringing version of one of its works; the case of a firm which circumvents a technical protection system to stop software it had licensed from monitoring certain uses of the software in ways not contemplated in the license agreement and which the licensee regarded as unwarranted and detrimental to its interests. *See* Burk, *supra* note 235 (emphasizing that the new access control rights might be used to break the time limit on copyrighted materials). For an analysis of the inadequateness of the

These characteristics give rise to a "paracopyright,"[311] in which the new access right is designated by a closed set of exemptions. Outside these cases, the only way to gain access to technically-protected works is by the permission of the content owner.[312] Therefore, when a user engages in the circumvention of an access control, and the post-circumvention acts also amount to a copyright infringement, the copyright violation is accompanied by the illegal act of circumventing an access control. Even if the post-circumvention behavior is not a copyright infringement, it might still violate the Anti-Circumventing rule. The dimension of the fair use provided by the copyright law is therefore reduced at the layer of the Anti-Circumvention rule that provides only a limited set of exemptions.

The act of circumventing a right-protection measure is not outlawed by statute. The legality of the act of the circumvention depends on the post-circumvention activity.[313] Unlike the previous case, such legality, not being covered by a different layer of "paracopyright," will be assessed under the general copyright law.

The type of asymmetry characterizing these rules was probably the result of an (imperfect) attempt by the legislature to preserve the application of the fair use doctrine. The differential treatment of access control measures was based on the idea that lawful access is a prerequisite for fair use rights.[314] Such a requirement, some commentators say, can be understood by an analogy to private property where there is no right to break and enter a dwelling in order to gain access to public domain information.[315] Dan Burk and Julie Cohen have pointed out that even following such an argument[316] the

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research exemption, see Joseph Liu, *The DMCA and the Regulation of Scientific Research*, 18 BERKELEY TECH. L.J. (forthcoming 2003).

311 *See* H.R. REP. NO. 105-551, pt. 2, at 24 (1998) (quoting a letter where 62 law professors define DMCA Anti-Circumvention provisions as "paracopyright"); *see also* Burk, *supra* note 235, at 1106 (stating that "DMCA anti-circumvention provisions . . . enable a new form of exclusive right, a right of access").

312 *See* Burk, supra note 235, at 1109 (stating that "[t]his new right of access facilitates not merely the licensing of copyrighted materials – copyright law standing alone would enable such licenses – but also allows licensing of access to unprotected materials. Just as in the case of any other intellectual property right, the owner of technologically controlled materials may authorize or deny access, which is to say that he may license access."

313 Reeves, *supra* note 299.

314 *See* Samuelson, *supra* note 228.

315 *See* David Friedman, *In Defense of Private Orderings*, 13 BERKELEY TECH. L.J. 1151 (1998); Raymond T. Nimmer, *Breaking Barriers: The Relation Between Contract and Intellectual Property Law*, 13 BERKELEY TECH. L.J. 827 (1998).

316 This argument is not easy to agree to as "both the economics of intangible information and the scope of state-granted rights in informational works

owner of a private real estate cannot fence in public domain property.[317] Therefore, the access limitation should be legitimate as far as the fence does not apply to public property.

The legislative history of DMCA reveals that the legislature was willing to preserve this balance. The Report of the Committee of the Judiciary of the House of Representatives accompanying the DMCA stated: "[a]n individual [should] not be able to circumvent in order to gain unauthorized access to a work but [should] be able to do so in order to make fair use of a work which he or she has acquired lawfully."[318] Such an asymmetry as we have pointed out would have addressed this need.[319] If this was the purpose of the legislature, the problem shifts to how access control and copy control measures are to be distinguished. Copyright owners have a strong incentive to use access protection systems rather then copy protection systems and to sustain a broad interpretation of the access control provisions.[320] In the course of interpreting these rules, some courts have widened the concept of access protection by recognizing it in cases of merger protection.[321] The result is that technology writers use access control to fence in as much content as they can. The strategic use of access control outside the boundaries of copyright law, even in absence of consent the derogation of general law, becomes an essential instrument of private legislation.

Consequently, the copyright owner may cause the consumer to contractually relinquish his rights. Outside the perimeter of these already troublesome contractual clauses, the use of access controls or merged controls allows the technology writer to limit behaviors which, even if legitimate under copyright law and not given up by contract, nevertheless constitute infringement of re-enforcement rules.

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differ markedly from the economic and legal bases for private rights in real property." Burk & Cohen, *supra* note 230, at 52.

317 *See* 43 U.S.C. §§ 1061, 1063 (2003); Camfield v. United States, 167 U.S. 528 (1897); Stoddard v. United States, 214 F. 566 (8th Cir. 1914); Hanley v. United States, 186 F. 711 (9th Cir. 1911).

318 H.R. REP. NO. 105-551, pt. 1, at 15 (1998) (Section-by-Section Analysis of § 1201(a)(1)).

319 The anti-circumvention rule of 17 U.S.C. § 1201(a)(1) "does not apply to the subsequent actions of a person once he or she has obtained authorized access to a copy of a work protected under Title 17, even if such actions involve circumvention of additional forms of technological protection measures. In a fact situation where the access is authorized, the traditional defenses to copyright infringement, including fair use, would be fully applicable. So, an individual would not be able to circumvent in order to gain unauthorized access to a work, but would be able to do so in order to make fair use of a work which he or she has acquired lawfully." H.R. REP. NO. 105-551, pt. 1, at 18.

320 *See* Reese, *supra* note 301.

321 *See, e.g.*, Universal City Studios, Inc. v. Corley, 273 F.3d 429 (2d Cir. 2001).

4. 'JURIDICAL PARTICULARISM'

The digital enforcement of preemptive rules – undertaken by the described distribution/regulation model – leads to a derogative system which is "equivalent to any of the exclusive rights within the general scope of copyright."[322] The idea of "private legislation" – used before and outside of DRM,[323] but here referring only to the peculiar characteristics of DRM[324] – might make it possible to think of this model of distribution/regulation as a form of neo-feudalism. Working in the context of adhesion and standard contracts, Friedrich Kessler[325] analyzed the regression of several contractual relations away from the nineteenth-century model, which was based on bilateral relationships, toward a model in which status predominated over will and "powerful industrial and commercial overlords . . . impose a new feudal order of their own making upon a vast host of vassals."

When considering DRM, the metaphor of feudalism seems inadequate for two reasons. First, the feudal model was an organic system that developed before the existence of the modern state. In contrast, the privatization of the law phenomenon does not give rise to an organic system, but rather to an unstructured coexistence of subsystems which is based on a dynamic and tense relationship with legislation (copyright law). Second, the image of feudalism highlights the unfair imposition of overlords on vassals (copyright owner and users).[326] Quite differently, the effects of the privatization of law do not necessarily create a system of imposition but instead, perhaps more neutrally, a different model of regulation. Private law might be looked at as a peculiar and possibly inevitable way to regulate the digital environment. Even though it is characterized by a different

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322 *ProCD*, 86 F.3d at 1455.

323 *See, e.g.*, Robert P. Merges, *Expanding Boundaries of the Law: Intellectual Property and the Costs of Commercial Exchange: A Review Essay*, 93 MICH. L. REV. 1570 (1995) (reviewing PETER A. ALCES & HAROLD F. SEE, THE COMMERCIAL LAW OF INTELLECTUAL PROPERTY (1994)); *see also* J.H. Reichman & Jonathan A. Franklin, *Privately Legislated Intellectual Property Rights: Reconciling Freedom of Contract with Public Good Uses of Information*, 147 U. PA. L. REV. 875 (1999). See also the older view expressed in Kessler, *supra* note 293.

324 "Plaintiffs seek, through CSS, to write their own copyright laws, to put legal force behind *any* restrictions chosen by a copyright holder, without respect for time limits on copyright, the amount of uncopyrightable material within the protective envelope, or the doctrines of first sale and fair use." Brief of Professor Charles R. Nesson as Amicus Curiae, *Corley*, 273 F.3d 429 (2d Cir. 2001), *available at* http://cyber.law.harvard.edu/openlaw/DVD/filings/NY/0510-amicus.html.

325 Kessler, *supra* note 291, at 640.

326 For the use of the feudalism as a model of imposition in the digital environment, see Alfred C. Yen, *Western Frontier or Feudal Society?: Metaphors and Perceptions of Cyberspace*, 17 BERKELEY TECH. L.J. 1207 (2002).

equilibrium between law enforcement and will, this new approach may not structurally lead to a system of imposition.[327]

Based on such considerations, it would be preferable to refer to Juridical Particularism,[328] a concept used by nineteenth-century French and Italian Juridical Positivism[329] to describe the structure of the legal systems in continental Europe (particularly in France) between the seventeenth and the early eighteenth centuries. The situation to which historical Juridical Particularism referred was characterized by the existence of a multitude of sub-legal systems, some inherited from the feudal era, which intermingled with other legal systems. These multiple layers interacted within a legally-decentralized monarchy. The uncoordinated and intermingled systems coexisted with a multitude of different *iurisdictiones*,[330] in which independent authorities were able to produce and to apply the law. The *iurisdictiones* did not produce and enforce the law solely on behalf of the monarch, but also as an expression of private sovereignty.

The model of distribution/regulation arising from DRM can be contingently characterized by the imposition undertaken by private parties through meta-legal constraints, and the model may result in the substitution of technical code for the legal code. This Article deals

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327 If this possibility were not true then the existence and the use of DRM and their *erga omnes* effects might be regarded as structurally illegal under the traditional principles of copyright law.

328 *See* GIOVANNI TARELLO, STORIA DELLA CULTURA GIURIDICA MODERNA (1976).

329 The doctrine was not popular in Germany, and it is still characterized by a tendency toward corporativism and historicism.

330 The word *iurisdictiones*, used in this context, cannot simply be translated as jurisdiction. *Iurisdictiones* are those private or public entities capable of applying rules, and at the same time of undertaking a certain legislative production. Enforcement and private legislation are also characteristic of DRM systems. Whereas the first element is highly troublesome from a legal point of view, the second is, to a certain extent, neutral. Its legality depends on the way it is undertaken and on the rules that are enforced. See Julie E. Cohen who, referring to the Reporter's Notes and the prefatory memorandum accompanying Proposed Article 2B of the Uniform Commercial Code (U.C.C.), points out:

> [B]oth . . . make clear their belief that even mass market contracts that are inconsistent with copyright are not necessarily invalid . . . . Such material could be repossessed or 'depossessed' electronically only if the licensor first gained physical possession of the copy (subject to the 'breach of the piece' limitation) or if the license authorized the repossession and the licensor gave at least ten business days' notice."

Julie E. Cohen, *Copyright and the Jurisprudence of Self Help*, 13 BERKELEY TECH. L.J. 1089 (1998). See also the Piracy Prevention Act, H.R. 5211, 109th Cong. (2002), introduced in July 2002 by Reps. Howard Coble (R-NC) and Howard Berman (D-CA), which would release copyright owners from liability for hacking the file systems of suspected peer-to-peer copyright infringers.

with such problems of imposition. Nevertheless, even if we solve the threat of imposition, it is not possible to avoid recognizing the other structural features of this model, including its Juridical Particularism. In the DRM context, and more broadly in digital enforcement, we do not use this notion to describe the *possible* regression to a system of imposition. Instead, it refers to the *structural*, and not necessarily negative, shifting of digital content regulation – and of the legal system – to more complex and unsystematic relations between private will and public sovereignty – between who creates the legal constraint and who enforces it.

D. USERS' PROTECTION MODEL AND THE PRIVATIZATION OF INFORMATION

Another aspect of the imposition that DRM and the digitalization of information may produce does not emerge from an attempt by copyright owners or DRM developers to rewrite the copyright law, but instead from a certain interpretation of copyright law which tends to shift the law toward a stronger propertarian model. In such a model, aside from a closed set of exemptions, there is no real space for a fair use doctrine. Such a phenomenon, which we describe as the "propertization of information," is grounded in a variety of approaches, and represents not a derogation of copyright law, but an alleged clarification of it.[331] This process of clarification particularly is strengthened by the advent of digital enforcement.

The two phenomena, propertization of information and privatization of law, may partially overlap.[332] On the one hand, the ability of the copyright owner to rewrite copyright law might be justified by arguing that fair use was invalid in the first place. The same strategy can be pursued by sustaining the legitimacy of the para-copyright provisions which allow DRM producers to impose and enforce private legislation.[333] On the other hand, it is true that the same

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331 See P. Bernt Hugenholtz, who describes the "[a]ttempts to expand (or, more subtly, 'clarify') the scope of copyright protection" in the European and international contexts. P. Bernt Hugenholtz, *Fierce Creatures, Copyright Exemptions: Toward Extinction?, Rights, Limitations and Exceptions: Striking a Proper Balance*, IFLA/IMPRIMATUR CONFERENCE 30-31 (Oct. 1997).

332 Some commentators in fact treat such phenomena in the same context. *See, e.g.*, Julie E. Cohen, Lochner *in Cyberspace: The New Economic Orthodoxy of 'Rights Management,'* 97 MICH. L. REV. 462 (1998).

333 The anticircumvention rules structurally allow copyright owners and technology writers to develop and impose on the user certain behaviors which are limited not by copyright law but by a closed set of exemptions. In *Corley*, the constitutional challenge to anticircumvention rules was based on the alleged restriction of fair use. *See* Universal City Studios, Inc. v. Corley, 273 F.3d 429 (2d Cir. 2001). The court rejected the challenge in part not by demonstrating that fair use

forces that support the models of private legislation also support a rewriting of the copyright laws.[334]

The phenomena nevertheless seem to differ in the sense that assuming a model of propertized information would affect the possible user behaviors beyond the boundaries of the technical enforcement. Congress might allow users to enjoy only the uses that the technology and a wide – but limited – set of exemptions allowed.

The propertization of information represents a threat to the future effectiveness of the breathing exemption that a users' protection approach is intended to preserve.[335] It is also a potential threat to the existence of other limitations on copyright, such as the limited times clause[336] and the first sale doctrine.[337] It is a phenomenon involving the legislature,[338] but one which is also developed by commentators,[339] and applied by courts.

1. FAIR USE AS A CONTINGENT RESPONSE TO A MARKET FAILURE

A first argument consistent with a propertarian model of information can be found within the interpretation of the fair use

– which is unpredictable in practice – was not threatened, but by shifting to the argument that even assuming constitutional relevance of such a doctrine, there was not a fair use to be breached in the case described. "[W]e know of no authority for the proposition that fair use, as protected by the Copyright Act, much less the Constitution, guarantees copying by the optimum method or in the identical format of the original." *Corley*, 273 F.3d at 459.

334 Both the ability to unilaterally derogate copyright law and to interpret copyright law in the digital environment so as to nullify the impact of fair use doctrine serve the interests of copyright owners. *See* Cohen, *supra* note 279, at 468 (referring to a peculiar "Convergence of Economic Imperatives and Natural Rights").

335 As the propertization of information can affect other traditional limitations on copyright law, it is relevant even in systems based on a droit d'auteur tradition. For the expansion of copyright law affecting the European system, see Hugenholtz, *supra* note 331, at 30-31.

336 The process of stretching the constitutional limit of limited times, is not new to copyright law. *See* Eldred v. Ashcroft, 537 U.S. 186 (2003).

337 *See supra* note 245.

338 An instance of the propertization of information may be seen in the design of Directive 2001/29/EC, *supra* note 245, which provides a list of exemptions which a member state can decide whether or not to adopt.

339 *See* Wendy J. Gordon, *Fair Use as Market Failure: A Structural and Economic Analysis of the Betamax Case and its Predecessors*, 82 COLUM. L. REV. 1600 (1982).

doctrine as a legal response to a market failure.[340] Since some uses are not profitably controllable by the copyright owner, the legal system allows such uses to be freely enjoyed by users. By this reasoning, when technology is capable of perfect control (as with the enforcement undertaken by DRM) and it can eliminate such market failures, it is also potentially capable of eliminating the justification for fair use. In this scenario, what might still be called copyright law would result in a law of privatized information limited only by a closed set of exemptions, chosen by the legislature.

The basis of this approach, the foundation of which was laid before the wide advent of digital technology,[341] is the fact that the existence of high market barriers – such as transaction costs, externalities, and non-monetizable benefits – leaves the copyright owner with a structural inability to profit from certain uses of his or her creative content. Due to the impossibility of creating a profitable market for these uses, the legal system requires the copyright owner to give them away. The renewed possibility of making a profit would eliminate this justification.[342]

The assumption of this approach is that the copyright owner initially has legitimate control over all the covered information and that it is only due to a contingent market failure for such goods that the otherwise illegal use becomes fair.[343] This argument has been challenged. The Supreme Court in *Campbell v. Acuff-Rose Music, Inc.*[344] found a fair use defense for parody even if a licensing market was

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340 Market failure, as defined by economists, refers to a situation where voluntary market exchange cannot achieve the socially optimal allocation of resources. *See* Cohen, *supra* note 279, at 471 n.25. One of the justifications for copyright protection is as a response to a market failure. According to Gordon, "[i]f the creators of intellectual productions were given no rights to control the use made of their works, they might receive few revenues and thus would lack an appropriate level of incentive to create." Gordon, *supra* note 339, at 1610. For the different justifications of copyright law, see WILLIAM FISHER, THEORIES OF INTELLECTUAL PROPERTY. The market failure approach to fair use seems to be more troublesome. For the market failure justification of fair use explanation, see Gordon, *supra* note 339, at 1627. *See also* Burk & Cohen, *supra* note 2; Raymond Shih Ray Ku, *Consumers and Creative Destruction: Fair Use Beyond Market Failure*, 18 BERKELEY TECH. L.J. 539 (2003) (critiquing the market failure approach to fair use).

341 *See* Gordon, *supra* note 339, at 1627.

342 Gordon proposes a three-pronged approach for assessing the need for fair use, which would require: (a) the existence of a market failure; (b) the social desirability of the transfer of the use to the defendant; and (c) the absence of "substantial injury to the incentives of the plaintiff copyright owner." Gordon, *supra* note 339, at 1614.

343 *See* Gordon, *supra* note 339, at 1615 ("An economic justification for depriving a copyright owner of his market entitlement exists only when the possibility of consensual bargain has broken down in some way.").

344 510 U.S. 569 (1994).

likely to develop.[345] However, the described tendency has nonetheless been followed by courts and commentators.[346]

In the courts, this approach has arisen within the interpretation of the fourth factor set out in 17 U.S.C. § 107 (2003),[347] which requires an assessment of the effect of the alleged infringing use upon the potential market for the copyrighted work.[348] If the ultimate justification of fair use lies in a market failure, then as long as a profitable market for the alleged fair use exists, it is very likely that the potential market would be affected.

In *American Geophysical Union v. Texaco, Inc.*,[349] the court dealt with the issue of whether to apply the fair use defense to the photocopying by Texaco researchers of articles originally published in a scientific journal.[350] In order to resolve this issue the court considered

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345 The Court found the adaptation of a song by the group 2 Live Crew to be fair use. Commentary, criticism, and parody are seen as a "second type of market failure in which the value of socially beneficial uses of copyrighted works is not fully internalized." Burk & Cohen, *supra* note 230, at 44; *see also* Merges, *supra* note 241.

346 Gordon claims that both the *Williams & Wilkins* and the *Betamax* cases are confirmation of his approach. Gordon, *supra* note 339; *see* Williams & Wilkins Co. v. United States, 487 F.2d 1345 (Ct. Cl. 1973), *aff'd*, 420 U.S. 376 (1975); Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417 (1984) (*Betamax* case). One critic claims that the possibility of licensing and a new market for time-shifting was not relevant to the majorities' fair use analyses. *See* Shih Ray Ku, *supra* note 340, at 555.

347 The test used to assess fair use consists of the follow four factors: 1) "the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;" 2) "the nature of the copyrighted work;" 3) "the amount and substantiality of the portion used in relation to the copyrighted work as a whole;" and 4) "the effect of the use upon the potential market for or value of the copyrighted work." 17 U.S.C. § 107 (2003); *see* Harper & Row, Publishers, Inc. v. Nat'l Enters., 471 U.S. 539 (1985).

348 As the Court pointed out in *Harper & Row*, the fourth factor was regarded as "the single most important element of fair use." *Harper & Row*, 471 U.S. at 566. Since *Acuff-Rose*, which stated that "all [four factors] are to be explored, and the results weighed together, in light of the purposes of copyright," 510 U.S. at 578, courts seem to have abandoned the idea that the fourth factor enjoys any primacy.

349 Am. Geophysical Union v. Texaco Inc., 60 F.3d 913 (2d Cir.1994).

350 The relationship between the extension of fair use and market failure had been previously raised in *Basic Books, Inc. v. Kinko's Graphics Corp.*, 758 F. Supp. 1522 (S.D.N.Y. 1991), where the court considered copying to be not protected by a fair use defense, as the sale of anthologies or packets to students would have had significant impact on the sale of textbooks, since the copy shop was a for-profit operation. The court nevertheless seemed to attempt to draft a balance, stating that "[w]hile it is possible that reading the packets whets the appetite of students for more information from the authors, it is more likely that purchase of the packets obviates purchase of the full text." *Basic Books*, 758 F. Supp. at 1534. The court did not engage in an analysis of the potential market, but rather concentrated on the damage to the existing market. A reaffirmation of the principle was provided by *Princeton*

the relationship between the fair use defense and the actual or potential existence of marketable control over such uses.[351] The district court's decision had regarded the existence of a possible licensing/royalty market as a ban on the recognition of a fair use defense.[352]

The Second Circuit claimed that the rigid and extensive application of such a principle might lead to troublesome outcomes because "were a court automatically to conclude in every case that potential licensing revenues were impermissibly impaired simply because the secondary user did not pay a fee for the right to engage in the use, the fourth fair use factor would always favor the copyright holder."[353] In an attempt to re-shape and limit this approach,[354] the court stated that, in order to be relevant under the fourth factor, the character of the potential market had to be either "traditional,

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Univ. Press v. Michigan Document Servs., 99 F.3d 1381 (6th Cir. 1996). In *Princeton University Press*, the court held that for-profit copying of academic readers could not be a fair use. For reasoning on the cases, see Lloyd Weinreb, *Fair's Fair: A Comment on the Fair Use Doctrine*, 103 HARV. L. REV. 1137, 1161 (1990).

351 Certainly one important factor in the decision was that what might constitute a fair use for an individual user, might not be fair use for a multitude to practice. Louise Weinberg has pointed out that:

> Copyright proprietors claim that even if each individual act of library photocopying constitutes a "fair use," the problem is so great in the aggregate as to effect a shift from a fair use to infringement . . . . What may be fair use in the individual case may seem less so when advanced technology can multiply the transaction endlessly.

Louise Weinberg, *The Photocopying Revolution and the Copyright Crisis*, PUB. INT. L. REP. 99, 108 (1975). Such an argument might be applied to the assessment of fair uses and the mass effects of circumventing devices.

352 Am. Geophysical Union v. Texaco, Inc., 802 F. Supp. 1 (S.D.N.Y. 1992). The Second Circuit commented that:

> [I]f Texaco's unauthorized photocopying was not permitted as fair use, the publishers' revenues would increase significantly since Texaco would (1) obtain articles from document delivery services (which pay royalties to publishers for the right to photocopy articles), (2) negotiate photocopying licenses directly with individual publishers, and/or (3) acquire some form of photocopying license directly with individual publishers, and/or (3) acquire some form of photocopying license from the Copyright Clearance Center Inc.

Texaco, 60 F.3d at 929.

353 *Id.* at 930 n. 17.

354 In *Acuff-Rose*, 510 U.S. at 592, the Supreme Court noted that there was no recognition of a derivative market for critical works only because of the unlikelihood "that creators of imaginative works will license critical reviews or lampoons . . . ." In *Twin Peaks Productions, Inc. v. Publications Int'l, Ltd.*, 996 F.2d 1366, 1377 (2d Cir. 1993), the exclusion of the impact of the fourth factor on fair use was due to the fact that the owner had no interest on occupying the potential market.

reasonable, or likely."[355] In *Texaco*, the market was recognized and this justified the exclusion of the fair use defense.[356] Even the dissenting judge did not challenge this approach and evaluated the three requirements of likelihood, reasonableness, and traditionality as adequate for reshaping and limiting the impact of the fourth element (impact on the potential market).[357] However, the dissent argued that the possible market in *Texaco* did not have such characteristics, because "the CCC scheme is neither traditional nor reasonable; and its development into a real market is subject to substantial impediments."[358] The principle stated in *Texaco*, when applied within as perfect a system of control as digital enforcement, would put a wide range of traditional fair uses back into their – allegedly – "natural" position: under the control of the copyright owner. This effect again would not depend on the initiative of technologists and copyright owners, but would flow from a "clarification" of the copyright law.

Such an interpretation might result in a propertization of information in the digital ecosystem in a way that might have different degrees of application. In an advanced application of such approach, Trotter Hardy suggests a total proprietization of information in the digital environment by abandoning copyright law.[359] Tom Bell[360] imagines a world where lawmakers "should allow information consumers and providers to exit freely from copyright law into contract law."[361] The contract in this case, even if it might appear to be a derogation of copyright law, would simply be the result of negotiation over a good: the information.[362] Unlike in the Hardy

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355 *Texaco*, 60 F.3d at 930 ("[O]nly an impact on potential licensing revenues for traditional, reasonable, or likely to be developed markets should be legally cognizable when evaluating a secondary use's 'effect upon the potential market' . . . .").

356 The Copyright Clearance Center (CCC) collects photocopying royalties.

357 *Texaco*, 60 F.3d at 932 (Jacobs, J., dissenting).

358 *Id.* at 937.

359 Trotter Hardy, *Property (and Copyright) in Cyberspace*, 1996 U. CHI. LEGAL F. 217.

360 Bell, *supra* note 254. Among others, Bell refers to the approach of the report of the U.S. DEP'T OF COMMERCE, INTELLECTUAL PROPERTY AND THE NATIONAL INFORMATION INFRASTRUCTURE: THE REPORT OF THE WORKING GROUP ON INTELLECTUAL PROP. RIGHTS (1995), *available at* http://www.uspto.gov/web/offices/com/doc/ipnii/ipnii.pdf [hereinafter NII WHITE PAPER], which refers to a possible reduction of fair use rights in the digital environment as a consequence of the diffusion of DRM, saying that fair use doctrine "does not require a copyright owner to allow or to facilitate unauthorized access or use of a work." *Id.* at 231.

361 Bell, *supra* note 360, at 562.

362 See Bell, who points out that "[i]ncreasingly, consumers in all probability will find that access to information in digital intermedia comes subject to

model, in the Bell approach copyright law would still play some minimal role.[363] Such privatization would result in a benefit for the users, as it would make available, in the digital environment, valuable content at a low price. According to Bell, "[e]ntrepreneurs can create a world where information costs less than it does under fair use, and perhaps even one where the public gets paid to consume information."[364] Paul Goldstein[365] highlights the way in which the increased potential for control created by technology should allow copyright owners stronger control over uses.[366] "Lawmakers should be quick to extend copyright to encompass . . . [such uses], even if the rules are construed as private."[367] Consistent with this view, the rule preventing Congress from extending copyright control over private uses is seen as justified only by contingent transactional costs.[368] Under this model, the criterion of a discipline without exceptions to liability[369] would still be limited due to the existence of the express exceptions chosen for their social value by the legislature.[370]

The main criticism raised against the *Texaco* approach has been one of circularity. If the core of the fair use assessment is to verify the fairness of a use and the consequent impossibility of a copyright owner controlling and licensing such a use, then the existence of a potential

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contractual provisions that aim to secure rights more broad than those provided by the Copyright Act." Bell, *supra* note 360, at 577.

363 *See* Cohen, *supra* note 279, at 477 (stating that Bell still considers copyright law as a sort of source of default legal rules).

364 Bell, *supra* note 360, at 562

365 PAUL GOLDSTEIN, COPYRIGHT'S HIGHWAY, THE LAW AND LORE OF COPYRIGHT FROM GUTENBERG TO THE CELESTIAL JUKEBOX 200 (1994).

366 *See* GOLDSTEIN, *supra*, at 200 ("[S]ince the statute of Anne, copyright has aimed at subjecting the production of literary and artistic works to the discipline of market forces; because the celestial jukebox can keep a record of every selection a subscriber makes, and the price he paid for it, copyright owners will have a far more precise measure of the demand for their products than they do today.").

367 *Id.* at 200.

368 *Id.* at 217.

369 Goldstein points out:

> [A]s these costs dissolve, so, too, should the perceived need for safety valves such as fair use. Indeed, the economic logic of the celestial jukebox, when superimposed on the text of the Copyright Act, might produce a law that contains no exemptions from liability at all. Even if not repealed, these exemptions will atrophy as suppliers obligate their subscribers contractually to pay for now exempted uses of copyrighted material.

Id. at 224.

370 *See id.* ("[O]ne problem with this logic is that the celestial jukebox will not entirely displace traditional copyright markets, where exemptions will still be needed. Also, some of the 1976 Act's exemptions are there, not because of transactions costs, but because certain uses and users serve socially valuable ends. The statutory exemption for classroom performances of copyrighted works in non-profit educational institutions is one example.").

market might be the result in the the negation of fair use rather than its justification. The circularity criticism is valid where the adopted concept of fair use is based on the assumption of a continuing balance between freedom and control as existing in the functional constitutional propertarian model. If the existence of propriety over information is only justified by the need to stimulate creativity, the ability of fair uses to foster such innovation must also be recognized.[371] However, if the reasoning is based on a market failure model, then it is not circular. If the ultimate justification of fair use is a failure in the market mechanism for a certain use, the existence of a market for such a use, undertaken without the copyright owner's consent, impedes its qualification as fair use. The court in *Texaco* seems to retain such a market failure approach. The limits put forth on such an approach – "traditionality," "reasonableness," and "likelihood" – are not inconsistent with it.

Even if this market failure reasoning is not itself vitiated by circularity, similar circularity seems to arise when this reasoning is regarded as a demonstration of what the market failure approach itself implies: the commodified nature of information.[372] The market failure model of fair use implies a market constituted by uses of the copyrighted works which are mere commodities belonging to the copyright owner.[373] Applying such an approach to perfect digital enforcement would mean creating a model of a privatized information market. The circularity of the market failure model[374] arises not when it is used as a descriptive model for calculating the role of given values, but when it is suggested as a tool capable of focusing and choosing among those values.[375] On the contrary, such an approach is logically

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371 Referring to the public domain, Jessica Litman argues that "[t]he public domain should be understood not as the realm of material that is undeserving of protection, but as a device that permits the rest of the system to work by leaving the raw material of authorship available for authors to use." Jessica Litman, *The Public Domain*, 39 EMORY L.J. 965, 968 (1990).

372 It is true that under a market failure approach, where the control is perfect then fair use is likely to be limited. It is also true that when applied to digital enforcement, under such a doctrine fair use may disappear. The theory does not add anything to the discussion of the nature of information, as its very premise is that information is a good.

373 *See* Cohen, *supra* note 279, at 510 ("Hardy's 'pie' is incomplete, in that it omits the slice consisting in 'no-protection,' . . . .").

374 Although not the circularity of the reasoning which is based upon that model.

375 *See* Cohen, *supra* note 279, at 510 (criticizing the application of the Gordon argument by Hardy). Cohen states that:

> [F]or Hardy's model to be accurate, we must know what sort of access regime would maximize the production and distribution of creative and informational works over the long term, and know that assigning absolute property entitlements to copyright owners would lead to implementation of that regime more cheaply. . . . Even if it

inconsistent since the privatized nature of information is not its conclusion but its premise.

2. NON-EXISTENCE OF A GUARANTEE TO ENJOY A FAIR USE BY THE "PREFERRED TECHNIQUE"

While the above approach leads to the privatization of information based on a market failure model of fair use, another type of argument leads to a similar result by a clarification of the application of fair use doctrine in the context of a new technology. In *Universal City Studios v. Corley*, 273 F.3d 429 (2d Cir. 2001), the court dealt with a constitutional challenge based on an alleged DMCA-based violation of the fair use doctrine. In its reasoning about the application of the anticircumvention provisions, the court analyzed the impact of the digital technology on fair use doctrine. The appellants, accused of violating the DMCA, contended that "fair use extends to works in whatever form they are offered to the public," referring to the need for the user to be able to enjoy the content of a DVD in digital form.[376] After expressing numerous doubts as to the constitutional basis of the doctrine, the court rejected the characterization that the fair use doctrine, as protected by the Copyright Act, guarantees copying by the optimum method or in the identical format to the original, and pointed out that it has never been held that the fair access to copyrighted material must be undertaken "by the fair user's preferred technique or in the format of the original."[377] Therefore, the court found that the possibility of enjoying such use through other available technologies, even those of inferior quality, would have fulfilled the users' fair use demands. "The fact that the resulting copy will not be as perfect or as manipulable as a digital copy obtained by having direct access to the DVD movie in its digital form, provides no basis for a claim of unconstitutional limitation of fair use." In the court's view, then, other available reproduction methods such as analog copying can provide sufficient fair use.

The *Corley* appellants' arguments presupposed the idea that the enjoyment of fair use was an inherent feature of copyright law which evolves along with changing technology in order to address the constitutional purpose of promoting progress and useful arts. Consistent with such an approach, copyright law has always

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> results in increased consumer access to digital works, a private law regime designed to maximize control will not necessarily result in more or better creative progress.

See Cohen, *supra* note 279, at 497.

376 *Corley*, 273 F.3d at 459 n. 35.

377 *Id.* at 459.

represented a balanced response to technological change. In the *Betamax* case,[378] the Supreme Court noted that when a new technology arises, the assessment of the balance between control and freedom must be considered very carefully by the courts:

> [A]s new developments have occurred in this country, it has been the Congress that has fashioned the new rules that new technology made necessary. . . . In a case like this, in which Congress has not plainly marked our course, we must be circumspect in construing the scope of rights created by a legislative enactment which never contemplated such a calculus of interests.[379]

If the legislature had decided to change this balance in the digital environment, it might have done so on the grounds that such a choice would have been the result of the demonstrated higher ability of a commodified information model in such an environment to address the need to foster innovation. There is no such claim in the DMCA, however,[380] and the history of the statute demonstrates the absence of such a legislative intent.

If this is true, it should have been necessary for the *Corley* court to consider whether the anticircumvention rules constituted a threat to the fair use doctrine, considered under the traditional assessment. However, the court declined to assess whether the DMCA anticircumvention provisions would limit the extension of the doctrine in the digital technology environment.[381]

Instead, the court shifted to an argument which was only partially different from the one stated by the appellants.[382] The court built its reasoning on the principle that the Constitution does not ensure the enjoyment of a certain quality of fair use. This argument not only fails to address the impact of the anticircumvention provisions on fair use, but also widens the application of the argument that the Constitution does not guarantee the best technology available to enjoy fair use. If widely applied, this argument would subvert the role of fair use doctrine in digital enforcement. Since alternative technologies are available, even if they are of inferior quality, the consumer would

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378 Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417 (1984) (*Betamax* case).

379 *Id.* at 430-31.

380 On the contrary, the DMCA expressly states the unwillingness of the legislature to alter the assessment of fair use. 17 U.S.C. § 1201(c)(1) (2003).

381 *Corley*, 273 F.3d at 451.

382 One long-standing judicial strategy is to re-characterize the opponent's premise as a weaker position which cannot objectively be agreed with. This seems to be the strategy used by the *Corley* court.

always be provided with a "sufficient" amount of fair uses. From the point of view of the consistency of this reasoning with the nature of the doctrine, the argument seems to destabilize the traditional relationship between copyright law and technological change stated in *Betamax*. Furthermore, the *Corley* court did not consider the cost of acquiring the alternative technology through which the alternative fair use may be enjoyed. Even if we exclude the existence of a guarantee to enjoy a best available quality fair use, we must still distinguish between an alternative fair use – of inferior quality – which can be provided by the same technology, by one reasonably accessible to the user, or by a different technology that involves undue efforts, as in *Corley*.

3. FAIR USE V. *DROIT D'AUTEUR*: NATURAL RIGHTS AS THE SHAPE OF ECONOMIC IMPERATIVES

Another form of the propertization of the law may consist of a shifting of the copyright model toward a system resembling a *droit d'auteur* approach. Several commentators have discussed both the tendency toward shrinking the enumerated exemptions in the *droit d'auteur* systems[383] and the reduction of fair use in copyright law. What is interesting to note, particularly considering the worldwide application of the DRM model, is that the phenomenon of privatization of information, where it is challenging the very nature of the fair use exemption,[384] may find convenient intellectual justifications under the *droit d'auteur* systems. The *droit d'auteur* model, born as a shield against privileges,[385] may give the copyright owner a perfect tool of power. In the digital environment, natural law might

383 For a European commentary, see Hugenholtz, *supra* note 329.

384 *See* Von Lohmann, *supra* note 230; *see also* Samuelson, *supra* note 228, at 42 (discussing the need for an open exemption for "many legitimate reasons").

385 In the European legal tradition, the existence of absolute rights is the traditional instrument used to avoid privileges. In copyright law, such design of the law might have a chilling effect as the absoluteness of the natural right tends to positively affect the real owner of the rights – that is, producers. This function of the natural right – which resembles a privilege itself on the other side of the Atlantic – is in fact consistent with the development of continental European thinking. The end of juridical particularism and the system of intermingling privileges and private legislation was in fact due to the process of juridical centralization undertaken by absolutism. This process, carried out by the monarch, and supported by legal thinkers, was the basis of the codification of laws. In different contexts, such a process was theorized by Samuel von Pufendorf, Gottfield Wilhelm Leibniz, and in France by Jean Domat and Robert Joseph Pothier. *See, e.g.*, SAMUEL VON PUFENDORF, ELEMENTA JURISPRUDENTIAE UNIVERSALIS (1660).

become the best ally for the economic imperatives which ground part of the process of privatization of information.[386]

Copyright law may be seen as grounded in an attempt to defeat privileges and monopolies. Under the *droit d'auteur* model the same purpose results in the enjoyment of an absolute right. In the copyright model, the property right is not recognized as a private interest.[387] Even if that property right may be considered a fair return for the author's labor,[388] the return itself is not the reason but instead the means by which the legal system provides an incentive to foster innovation and creativity.[389] Fair use is a fundamental part of this scheme. The copyright balance between fair use and property can in fact be regarded as a balance either between the two different purposes of creation and diffusion[390] or between two different means to reach the same end – innovation.[391] Fair use is based on a constitutional

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386 *See* Cohen, *supra* note 279, at 468 (arguing about "[t]he [c]onvergence of [e]conomic [i]mperatives and [n]atural [r]ights").

387 *See, e.g.*, Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417, 429 (1984) (*Betamax* case) ("The monopoly privileges that Congress may authorize are neither unlimited nor primarily designed to provide a special private benefit."). Furthermore, "[t]he sole interest of the United States and the primary object in conferring the monopoly lie in the general benefits derived by the public from the labors of authors." Fox Film Corp. v. Doyal, 286 U.S. 123, 127 (1932) (Hughes, C.J.).

388 *See, e.g.*, Harper & Row, Publishers, Inc. v. Nat'l Enters., 471 U.S. 539, 546 (1985) ("The rights conferred by copyright are designed to assure contributors to the store of knowledge a fair return for their labors." (citing Twentieth Century Music Corp. v. Aiken, 422 U.S. 151, 156 (1975))).

389 The *Harper & Row* Court, referring to *Betamax*, underscored that:

> [This] limited grant is a means by which an important public purpose may be achieved. It is intended to motivate the creative activity of authors and investors by the provision of a special reward, and to allow the public access to the products of their genius after the limited period of exclusive control has expired.

Harper & Row, 471 U.S. at 546 (discussing *Betamax*, 464 U.S. at 429); *see also Betamax*, 464 U.S. at 477 ("[T]he monopoly created by copyright thus rewards the individual author in order to benefit the public.") (Blackmun, J., dissenting).

390 According to the American Committee for Interoperable Systems:

> The United States Copyright Act embodies a compromise between two competing goals: encouraging the creation of new works, and encouraging the widespread dissemination and use of works. To reconcile these competing interests, Congress in passing the Act, and the courts in applying it, have struck a delicate balance between the rights of authors and the privileges of users in a wide range of context. Any departure from this balance may have devastating consequences for producers and consumer welfare.

Brief Amicus Curiae American Committee for Interoperable Systems, ProCD, Inc. v. Zeidenberg, 86 F.3d 1447 (7th Cir. 1996).

391 According to Professor Ball:

> [The] author's consent to a reasonable use of his copyrighted works [had] always been implied by the courts as a necessary incident of

principle. In fact, although the constitutional relevance of the doctrine itself has been an object of controversy,[392] the interest that the doctrine is intended to protect has an express constitutional foundation.[393] Since the *droit d'auteur* model is not grounded on constitutional freedom of expression,[394] nor justified by a utilitarian model, any limitation is regarded as state intervention with the natural right of the author over his or her creation, and must be interpreted as narrowly as possible. Such a model, based upon an absolute right and a closed set of exemptions, is well suited for translation to the design of technology.[395] The convergence between DRM and a *droit d'auteur* model may be appealing in the information age.

> the constitutional policy of promoting the progress of science and the useful arts, since a prohibition of such use would inhibit subsequent writers from attempting to improve upon prior works and thus . . . frustrate the very ends sought to be attained.

H. BALL, LAW OF COPYRIGHT AND LITERARY PROPERTY 260 (1944). Professor Charles Nesson has stated that:

> [A]s the Court has noted, "Copyright law restricts speech," and the fair use doctrine serves as a crucial counterweight. "[C]opyright is intended to increase and not to impede the harvest of knowledge." Fair use, for commentary, criticism, and scholarship, including commercial use, helps to assure that copyright remains the engine of free expression congress is authorized to fuel, "to promote the progress of science and useful arts."

Brief of Amicus Curiae Professor Charles Nesson, Universal City Studios, Inc. v. Reimerdes, 111 F. Supp. 2d 346 (S.D.N.Y. 2000) (citations omitted).

392 This was in fact criticized in *Corley*.

393 Jefferson clearly refers to the idea that the freedoms embedded in copyright law are not the result of a public right to access a private commodity, but are instead due to a deeper reason based on the nature of information and guaranteed by the Constitution. Referring to the field of patents, Jefferson said that ideas:

> [S]hould freely spread from one to another over the globe, for the moral and mutual instruction of man, and improvement of his condition, seems to have been peculiarly and benevolently designed by nature, when she made them, like fire, expansible over all space, without lessening their density in any point, and like the air in which we breath, move and have our physical being, incapable of confinement or exclusive appropriation. Inventions then cannot, in nature, be a subject of property. Society may give an exclusive right to the profits arising from them, as an encouragement to men to pursue ideas which may produce utility, but this may or may not be done, according to the will and convenience of the society, without claim or complaint from any body.

Letter from Thomas Jefferson to Isaac McPherson, *supra* note 19; *see also* Benkler, *supra* note 235; Litman, *supra* note 235.

394 On the relations between copyright and freedom of expression, see H. Cohen Jehoram, *Freedom of Expression in Copyright Law*, [1984] EUR. INTELL. PROP. REV. 2. *See also* Hugenholtz, *supra* note 240.

395 *See* von Lohmann, *supra* note 230.

The possible influence of a *droit d'auteur* model would depend on the internal evolution of the copyright doctrines inside the European Union. There might be several alternative ways to an absolute right in *droit d'auteur* countries. Some scholars from the *droit d'auteur* tradition, such as Tullio Ascarelli,[396] argued decades ago for the necessity of adopting a utilitarian model by which to assess the role of such limitations.[397] The adoption of this model should account for the substantial differences that characterize most of the *droit d'auteur* systems: the absence of judicial power engaged in a creative interpretative role, and the existence of an exemption by general clause which allows the judiciary power to undertake such role.[398] These two features of the American system (one characterizing the role of the judiciary, the other pertaining to the copyright discipline), provide the best framework for the functional nature of copyright ownership, that is, the dynamic instrument of the utilitarian approach. In *droit d'auteur* legal systems, even where civil law judiciaries are considered substantially flexible, the lack of a general clause of the type of the fair use model might constitute a fundamental ban against a substantial application of a utilitarian model. A possible solution would be to refer – as currently occurs in the German system – to other flexible limitations existing in the proprietarian tradition, such as the concept of the "social function of private property." The use of this or other intellectual tools might constitute a way to realize a utilitarian model, while remaining consistent with the strongly proprietarian character of the *droit d'auteur* tradition.

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396 Ascarelli highlighted how the limitations to copyright law should not be considered as flowing from the proprietarian model of the *droit d'auteur*, but instead are consistent with the very reason that property is contingently and limitedly recognized. *See* TULLIO ASCARELLI, TEORIA DELLA CONCORRENZA E DEI BENI IMMATERIALI (1956).

397 It nevertheless should be noted that the application of the utilitarian model is also peculiarly strengthened in the United States legal tradition by the existence of a strong tradition of freedom of expression. Therefore the adoption of such a model in different systems would face different types of constitutional values which could undermine the impact of such an interpretation. Particularly in European culture, the concept of equality has a primacy over the concept of identity and expression. The reason for this is that the freedom created in Europe is a freedom *in* the State rather than *outside* the State; whereas the First Amendment to the Constitution of the United States is founded on the assumption of the freedom of the individual against the State. The strand of enlightenment thought that more closely resembles the concerns of the First Amendment is that of Voltaire. Voltairian thought is based on the principle of tolerance and the idea of freedom "from" the State, on which the First Amendment is grounded.

398 The concept was first introduced in Germany by the Weimar Republic Constitution, which stated that since property confers duties, the owner should use it for the sake of the common best. *See* WEIMAR REPUBLIC CONST. art. 153(3) (Aug. 14, 1919).

E. SHIFTING DRM REGULATION FROM INFORMATION INFRASTRUCTURE TOWARD AN 'INFORMATION SOCIETY'

It has been said that *ubi societas ibi ius* – where there is a society, there is the law.[399] Both society and law are typical human expressions. If we agree with the humanism concept of "perfection" as "consistency" with human nature – and therefore with a model of embedded "imperfection"[400] – we may observe that among the different types of constraints, the law is the most perfect, since it is the most human. The legal constraints are in fact expressed by human language and therefore carry language's "imperfection," as well as the consequent flexibility required by the unpredictable evolution of the human society. Furthermore, law is better designed to constitute a democratic constraint since it is capable of consisting of transparent and substitutable rules.

In this Part we have considered how the phenomenon of digitalization may upset the role of this human constraint. While providing peculiar benefits, technology may be used to privately impose behaviors through a non-human, non-flexible language. Such process may lead or may be paralleled by a system where information becomes a mere commodity and loses the constitutional guarantees leading to an environment of "knowledge without freedom."

In such a context, the threat that digitalization – and in particular DRM – poses to fair use doctrine is a paradigmatic example of how the "Information Infrastructure" created by technology needs a

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399 The *Ubi societas ibi ius, ubi ius ibi societas* theory is set forth by Santi Romano, *Istitutionalism*, L'ORDINAMENTO GIURIDICO (1918), and MAURICE HAURION, TEORIE DE L'ISTITUTION ET DE LA FONDATION (1925).

400 *See* GIOVANNI PICO DELLA MIRANDOLA, DE HOMINIS DIGNITATE ORATIO (1486). The *Oratio*, written as an introduction to an international conference on philosophy which took place in Rome in 1487, contains some central picanian thoughts, and is regarded as being a central foundation of Humanism. In the *Oratio* the centrality of the human being is based on his freedom. Such freedom derives from the consideration that while every entity of nature is constrained by a certain design, the human being is free to shape his own design since unlike those entities he lacks of an original design (or we might say, code): "*non esse homini suam ullam et nativam imaginem.*" Quite interestingly, where at the layer of the system of communication the information infrastructure of the Internet has been (at least originally) designed to lack an intrinsic function, the digital technology when used as enforcement is highly constrained by its "perfection." We might say, through the point of view of the meta-legal picanian concept, that the phenomena of information society are highly inconsistent in nature. From one side, the digital infrastructure is inspired to a humanistic model of unpredicted design or function (the end to end); on the other, the digital technology as an enforcement system is incapable of unpredicted and broad application, and is therefore peculiarly non-human.

response from the law. If such a response will maintain the benefits of technology within a scheme where rules are grounded in the law and are made flexible to contain constitutional values, the constraints that will affect individuals will still have a human nature and the aggregates of the individuals will have the "human shape" of an Information Society.

IV. CONCLUSION

The two phenomena discussed here – modularization and digitalization – interact closely. Modularization of technology has freed functionality from physical limitations. Information – as the form of functionality in the digital environment – was enabled to "concentrate" on itself. Digitalization supports this process. By resolving information into a chain of 1s and 0s, the information is freed from the specifics of the respective physical carrier; it becomes media-unspecific. This fuels the convergence of the media, a development which poses new challenges to media regulation and makes necessary a review of past policies in this area.

The normative consequences of modular design have been largely unexplored. Certainly, specific modular structures should not be protected as such. On the contrary, since the mode of innovation is constantly changing, there is a need for continuous and flexible re-modularization. But rearranging modules is different from shifting towards de-modularization. Under de-modularization, hitherto separated spheres collapse, whether they are the different modules of multi-layered information systems, or the distinction between private rights and their State-mediated enforcement. There are peculiar dangers attached to this, particularly the fact that de-modularized structures are prone to concentration of power, a phenomenon for which liberal society has always been on alert.

As we have described, the merger of rights and their enforcement in DRM systems is likely to result in a juridical particularism, driven by private actors who can advance to function as private legislators. One response to this is insistence on the material balances of copyright law as prescribed by the Constitution; but a functional approach, as has been applied several times throughout this Article, might counsel for additional safeguarding of public values. When private entities assume quasi-public functions, it may be justified to subject them to principles similar to those which govern the State when acting in that same function. So it might be necessary to transfer selected principles of State action, including formal ones, to arrangements of private legislation. As far as the application of the

Constitution to private action is concerned, the doctrine of State action may have to be reviewed. Of special interest might be considering private standard-setting organizations from such a perspective, since they operate as a medium for the private rights-holders in their efforts to build viable DRM systems.

We have also pointed to the dangers attached to vertical integration of companies doing business on different layers of modularized information systems. In the case of the Internet, the leveraging of power from one layer to another is likely to result in a distortion of the (linked) processes of communication and innovation. In the case of computer systems products, the leveraging of a dominant player's power from one layer to another is also likely to result in impediments to the process of innovation. Besides the problems of this leveraging *within* modularized systems, it seems worthwhile to also pay attention to leveraging *across* modularized systems. Such a cross-leveraging of power can be detected in the *Microsoft* case. Microsoft allegedly engaged in anti-competitive behavior in the browser market by (mis-)using its dominant position in the operating systems market. Microsoft thus captured the market for Internet browsers, which can be viewed as functional equivalents of operating systems. It thereby leveraged its power not just from one market to another but from one modularized information system to another. This implies that we should pursue a comprehensive competition policy for information systems and carefully assess potential impacts across systems. Ultimately, it draws our attention to the connectedness and interdependence of the phenomena in the information environment.

However, the consequence cannot be to fight those developments in principle but instead to accompany this process by insisting on the balances and mandates prescribed by the Constitution.