Beyond Copyright and Patents for Software

Matthias Bärwolff

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Abstract

This paper points at the structural problems of affording an inappropriately wide variety of state conferred property rights to software. The current system is overly tilted towards producers and rights-holders, and neglects the crucial social importance of the availability of interface specifications. Indications as to measures aimed at correcting the current imbalance are given.

*This article has been slightly revised in January 2004, mostly for removing inconsistencies and raising clarity of language. The content has remained basically untouched.

1 Introduction

The present article briefly summarises the arguments surrounding the issue of intellectual property rights for software. It then goes on to point at the policy problems, and indicates desirable measures in correcting the current regime with its overly strong focus on strengthening private property rights in software products.

2 The Argument

From a legal perspective intellectual property rights embody the recognition and appreciation of intangibles as property items, for contractual measures alone would entail considerable practical difficulties in protecting an intangible as a property item in the conventional sense. There is, however, no conceptually coherent legal argument for bestowing a proprietary status on valuable information, nor is there any inherent natural right to authors and inventors.[1] Hence the legal position has to be seen in the light of economic and moral arguments surrounding the issue.

Essentially, the economic arguments in favour of IP rights boil down to that of fostering the creation of intangibles and their allocational efficiency in Coasian terms by granting private property rights of limited duration[2] which carry very much the characteristics of tangible property items. The accompanying and ubiquitous moral argument for IP rights builds on the romantic notion of the creator entailing a property right to *his* creation.

Yet the economic evidence that bestowal of private property rights promotes creative and inventive processes has been non-conclusive at best, and the moral argument is tenuous since the romantic conception of the creative individual as the rightful owner of his creation is a very current societal norm rather than one of universal validity.[3] Adding to this concern is the common

[1] See Walterscheid (1995), and Endeshaw (2001) for elaborations.

[2] There are other adjustable parameters of intellectual property rights, in particular the scope of the protection afforded.

[3] See Boyle (1988), and Boyle (1992) for a treatment of the romantic notion. Also, consider that, for example, in Asia the notion of creativity and innovation is fundamentally

dichotomy of creators and rights holders. It has been argued that the legal regimes for IP rights have traditionally favoured rights holders over creators (Kretschmer 2000).

Arguably, the principal thrust behind the mounting IP protection that software and other intangibles enjoy has been the accrual of private benefit to the rights holders inducing rent-seeking and due lobbying efforts *vis à vis* a rather unorganised and unknowledgeable public.[4] There is, in turn, a social cost to be borne by the public at large comprising not only monopoly inefficiencies but also a retardation of incremental innovation. Whether the benefit stemming from the presumably increased incentive to create outweighs the entailing costs is rather less clear. In fact, obtaining unambiguous empirical evidence in support of any policy measures is virtually impossible.

2.1 Copyright and Patents

Copyright has traditionally been seen as a means of encouraging initial intellectual investment in the creation of original literal works. Conventional reasoning holds that without such statutory protection potentially infinite duplication at virtually zero costs would deprive the rights holder of their dues once the creation has entered the public domain. However, there is practically no empirical evidence in favour of copyright as a means of promoting the creation of original literal work.[5]

Patents as government conferred property rights are not so much intended to reward creation but encourage dissemination of novel and useful inventions. The conferment of limited monopoly powers is a means of promoting ultimate dissemination into the public domain. Again, empirical evidence that patents actually encourage research and development is highly inconclusive.[6] The question of whether on balance the social benefits stemming

different from ours in that the individual that promulgates an *idea* is not generally regarded its owner.

[4]See North (1990), and Tang, Adams, and Paré (2001) for elaborations.

[5]See Watt (2000, pp. 113 ff.) for an excellent account of the history of copyright and the surrounding arguments.

[6]It is somewhat telling that Carlton and Perloff (2000, p. 512) only cite a rather tenuous 1973 survey of 27 British companies as evidence that patents encourage inventive

from the promotion of creation and dissemination into the public domain outweigh the static losses associated with monopoly pricing has been largely unaddressed by sound academic approaches due to methodologically difficulties.[7]

Moreover, the legal recognition of such evasive private property rights frequently entails significant transaction costs not only in the shapes of application and operational costs, but also those of litigation, defensive action, and socially undesirable strategic activities resulting in lowering public welfare.

2.2 IP Rights in Software

In the context of software as an intangible, additional concerns about the reasonableness of the currently practiced intellectual property rights regimes arise. Whereas the scopes of patent and copyright protection initially pertained to different subject matters, they become overlapping instruments in the case of software, for it has come to be considered both a literal and a functional creation. Thus both instruments have now become available to producers.

The application of the copyright to software entails considerable problems of conceptual coherence (Samuelson 1984). The requirement of a minimum originality to invoke copyright protection has been lowered considerably, and Millard (2000) concludes:

> The low level at which the originality threshold has tended to be fixed by the courts means that even relatively simple and utterly mundane works can be protected by copyright. This is very important in the computer context where programs and other

activity. For more cautious comments and analysis see Hart, Holmes, and Reid (1999, pp. 32 ff.) and references. For contrary evidence see Sakakibara and Branstetter (2001), and references in Amy Harmon, *Suddenly, 'idea wars' take on a new global urgency*, NY Times, November 11, 2001.

[7]However, Tang, Adams, and Paré (2001) observe a relatively high level of indifference towards patent information among smaller companies (SMEs), indicating a low level of importance of available patent information at least to this group of producers.

> functional works may lack aesthetic appeal and display little creativity yet be of tremendous commercial value. Were a higher threshold to be set for the originality test, it is probable that much computer software and data would fall completely outside copyright. (p. 187, footnotes omitted)

Whilst originally patents could not apply to algorithms and ideas as such the scope of patents been widened significantly to allow for the accommodation of software as a subject matter falling within the realm of patent protection (Widdison 2000). However, the established threshold requirements of usefulness, novelty, and particularly non-obviousness are proving hard to administer, giving rise to a growing number of *bad* patents,[8] increasing the costs stemming from uncertainty, litigation, and potential subsequent invalidation of patents.

Besides copyright and patent provisions license agreements and trade secrecy regarding the source code are widely employed means of cementing the property rights in software.

End user license agreements (EULAs) typically restrict usage and redistribution rights for buyers. Software is generally licensed to a consumer rather than sold, allowing the producer to impose greater restrictions and limitations on the consumer than it would be possible under a sales arrangement. The rights granted by the licence, not the program as such, constitute the software product. Amongst other common provision virtually every software licence specifically excludes the liability of the producer for faults of the software and ensuing economic losses (Ravicher 2000).[9]

Second, the absence of source code limits access to all potentially relevant and useful information about the software for the buyer. As Samuelson

[8] See Hart, Holmes, and Reid (1999, pp. 34 ff.).

[9] It is sometimes being argued that the relative ease of illegally copying software warrants restrictive licensing terms in order to allow for price discrimination that increases welfare on Pareto-efficiency grounds. However, Boyle (2000) considers such efforts futile since they necessitate unduly intrusive measures of information gathering. Lessig (1999, ch. 11) adds that even if technology renders such measures effectively non-intrusive dignity and equality are fundamental values that ought to be upheld.

(1984) observes: "Computer programs in machine-readable form are the first type of copyrightable work to have a major commercial value *without* disclosure" (p. 710, emphasis in original).

2.3 Protection of Software Interfaces

The available legal and technical means of asserting ownership in software confer a property right to the creation not only in conventional senses, but in most cases effectively also to the interface specifications. Such interfaces are typically large and not readily perfectly comprehensible. Yet in many cases knowledge of interfaces is essential in achieving compatibility and interoperability, for software technology is largely built upon communication between different layers of software, as well as horizontal communication via standardised data formats. Millard (2000) duly remarks:

> Much of the rapid growth and diversity that has characterised the computer industry in the last two decades has resulted from the widespread development of hardware and software products that are 'compatible' with those most popular in the market. Such compatible products frequently improve substantially on the products offered by the company that initiated the standard both in terms of price and performance, and often also in terms of innovation. (p. 205, emphasis in original)

Proprietary *de facto* standards can entail considerable social costs arising from lock-in effects in the presence of network externalities.[10] Even though the law has largely been sympathetic to reverse engineering in order to achieve interoperability and compatibility (Attridge 2000; Warren-Boulton, Baseman, and Woroch 1994), *de facto* proprietary standards do frequently arise due to the technical difficulties of reverse engineering large interfaces and the absence of a general legal requirement to disclose interface

[10]It is worthy of note that such standards do not primarily derive their economic value from the efforts of the producers but their adoption by the consumers.

specifications.[11]

2.4 Incentives

There are other ways of encouraging inventive activities than the bestowal of private property rights. Historically, a lot of important research has been conducted under systems of patronage or government funding, largely marked by an indifference towards pecuniary rewards from subsequent property rights in the subject matter. This particularly holds for commercially uninteresting, and long-term pioneering research.[12]

Also, there are possibilities to extract value from an intangible creation through auxiliary and related products, services, and market opportunities of a more tangible nature, potentially providing sufficient incentive for the initial creation of the intangible. Boyle (2000) rightly notes:[13]

> Information goods do not exist in isolation. The good [...] comes "bundled" with a large number of other customer needs, social implications, market effects, and business opportunities. These linked or bundled phenomena may well be excludable to a greater degree than the information good itself. (p. 2015)

3 The Problem

The current legal regime regarding software protection may be considered the result of historical accidents, rather than prudent policy measures and legal drafting unambiguously aimed at furthering public welfare. In recent years the discourse on the subject has intensified, and valuable insights both by legal and economic scholars have been made which are, however, largely of a theoretical nature.

[11] For example, despite considerable investment, IBM has failed in the mid-90s to clone the 32-bit Windows API.

[12] The development of the Internet is one such example.

[13] See also Hirshleifer (1971) for an earlier account.

Policy measures are rarely based upon proper empirical evidences, but are rather shaped by rent-seeking activities of producers, whilst the general public is rather uninformed and has little to no voice in the conflict between private and public rights considerations. The exertion of economic power allows for even less public involvement on a global scale where the adoption of the TRIPS provisions is becoming practically mandatory.[14]

It is not a new realisation that economic power undermines democratic principles.[15] But in the face of the potential public welfare losses stemming from the privatisation of ideas and information this is grounds for grave concern if one aims at furthering social welfare, and it is unfortunate that the people ultimately most affected by the formation of property regimes rarely participate in the debate. Boyle has repeatedly argued that "our intellectual property discourse has structural tendencies towards over-protection, rather than under-protection" (1997).

The information deficit on part of the general public is considerable, as the economic agents that stand to lose from changes to the current regime increase levels of misinformation and create noise in the face of information imperfections.[16] In particular it is the issue of compatibility impacting decisively upon the feasibility of creating complementary products and directly competing products in the presence of network externalities that appears to have far too little weight in the discussion.

4 The Remedy

The current regime of intellectual property rights is unbalanced and affects social welfare. It appears entirely reasonable to depart from the current

[14]Gerhart (2000) reminds us that "[i]t is nations, not people or their direct representatives, who make international law" (p. 311). See also Widdison (2000).

[15]Copp (2000) argues that "[c]apitalism spawns inequalities in economic power, and inequalities in economic power produce inequalities in political power of a kind that is undemocratic" (p. 82). Note that some economists have argued that it is precisely those inequalities that allow for "political freedom" (Friedman 1962) with, however, very tenuous arguments.

[16]See Edlin and Stiglitz (1995) and Stiglitz (2000) for the theoretical underpinnings.

practice of affording existing IP rights to software merely by virtue of them being applicable to some aspects of them, for it seems entirely unreasonable that both copyright and patents, along with contractual means and trade secrecy are at the disposal of producers *vis à vis* the consumers. Rather, a *sui generis* right should be introduced that takes the particular characteristics of software into account, and prohibits excessive use of intellectual property rights in protecting software.

- In order to make interface information available to the public, producers should be required to disclose full specifications at reasonable cost if any.
- Copyright shall only be invoked by software that is distributed along with their source code to allow for an easier understanding of the software.
- The availability of patents should be largely diminished by higher thresholds and more knowledgeable patent claim examiners. Complete disallowance should seriously be considered. For the market not to be distorted by monopolies, licensing should be made compulsory at reasonable and non-discriminatory rates, possibly determined by an independent body, and duration should be significantly limited.

A crucial condition for such measures to be implemented is a heightened awareness and bargaining position of the public. Providing information and raising awareness should in turn increase the public's knowledgeableness, entailing a stronger bargaining position *vis à vis* the government and private business interests.[17]

5 Conclusion

Production, invention, and transaction processes are functions of property rights regimes, established and enforced by the government by virtue of their

[17]See Brimelow (2001) on the issue of public involvement in the discussion.

coercive power. They can impose amendments to the existing set of rights, and a public knowledgeable opinion will to an extend impact on the government's policy if they prefer re-election. Clearly, without such an involvement of the public and their appreciation of a public domain the policy making will favour private interests over public ones.[18]

It is vital to appreciate that the producers' private benefits in the case of IP rights for software entails a social loss on part of the public. This loss may in turn ultimately affect the producers' private benefit, too, for the resolution of externalities is typically a dynamic rather than static process where the future is overly discounted.[19]

The public debate about the pertinent issues has just started, and it is to be hoped that the public will form an informed opinion, and bring about due changes in the property rights regime for software.[20]

[18]See Boyle (1997).

[19]See Dragun and O'Connor (1993) for a treatment of dynamic externality resolution.

[20]The "open source movement" may well be considered a voice that is exerting growing influence upon public opinion.

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