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P.A. van Brakel

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TO WHOM IT MAY CONCERN

The papers accepted for the 9th Annual Conference on World Wide Web Applications held on 5-7 September 2007 in Johannesburg have been peer-reviewed by external reviewers. The evaluation process was as follows:

Phase 1: A *Call for Papers* was published and abstracts received.

Phase 2: Abstracts were evaluated by an international committee and authors of selected abstracts invited to submit the full text of their papers.

Phase 3: Full text papers were received and blind-evaluated according to a set of criteria by the following peer-reviewers:

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Cape Town

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Phase 4: Authors of those papers selected were notified that their papers (with or without amendments) were added to the final programme of the Conference.

Phase 5: Papers were reformatted to PDF and published digitally in the permanent Conference Website (http://www.zaw3.co.za)

Further enquiries:

Prof P.A. van Brakel
Conference Chair
9th Annual Conference on WWW Applications
e-Innovation Academy
Cape Peninsula University of Technology
Cape Town
+27 21 469-1015 (landline)
+27 82 966-0789 (mobile)

Protecting the freedom of ideas: the anti-patent

R. Kaplan
School of Accountancy
University of the Witwatersrand
Johannesburg
South Africa
ryan@kaplan.name

G.W. Bertram
Johannesburg
South Africa
gustav.bertram@gmail.com

Abstract

This paper discusses the consequences of applying scarcity-driven models of value to information in the information age. We will examine the state of intellectual property (IP) law and the challenge of ensuring that a design remains unencumbered by patents. Emphasis will be placed on the need for anti-patents, a method for implementing them in licences, and their advantages to innovators, consumers and business. How can innovators protect the freedom of their ideas? Putting ideas in the public domain does not ensure that those ideas will stay free. Small improvements can always be patented, restricting the use of those ideas. Creators of copyrightable works can apply copyleft licenses to ensure that recipients of that work have the right to study, use, modify, and redistribute not only the work itself but also derivations. No similar license exists for patentable ideas. What is needed is an anti-patent, which would ensure the freedom of a patentable idea as well as the freedom of derivative ideas.

Keywords: Patent, anti-patent, IP law, intellectual property, open source, free software.

1. Introduction

As we enter the information age, entrenched ideas about the production of information are being challenged. Copyrights and patents have been justified as necessary incentives to produce information goods. There are even economic arguments that state that a free market would not produce information goods. Recent developments are starting to challenge these ideas.

The Internet has greatly reduced the cost of collecting and distributing information. This has enabled several communities to emerge that are efficiently producing information goods. Everything from news, to fiction, to textbooks, to fully functional operating systems, to reference works like encyclopaedias and dictionaries, are freely available online. Many of these works have even waived copyright restrictions, granting the right to freely use, modify and redistribute those works.

Information gift networks are nothing new. The scientific community has been producing scientific knowledge for centuries, and freely sharing that knowledge. But now the emergence of several other communities are starting to underline the fact that the scientific community is not an exception, but may in fact become the norm. However,

although there many communities are producing free copyrightable information, there are few that produce free patentable information.

Using constructive research methodologies, we therefore examine the state of intellectual property (IP) law and free culture, and investigate the similarities and differences between patents and copyrights. Building on this, we then address the unique concerns applicable to patents and examine the viability of a copyleft analogue for patents in an attempt to identify a cause for their absence.

2. Intellectual property

Intellectual property (IP) is the concept that one can hold rights over intellectual creations. This covers patents, copyright, trademarks, trade secrets and allied rights. Most IP laws are based on exclusion rights. Exclusion rights grant a way to enforce limited monopolies - limited to the area covered by that right. This paper will deal mostly with patents and copyright.

Copyright covers the expression of an idea. It is effective immediately upon the creation of a work, and holds power wherever copyright law is recognised. Copyright also covers derivative works - an original work changed into some other form, or a work that contains a substantial portion of a pre-existing work. A derivative work can violate a copyright, but generally two valid copyrights cannot be in mutual violation.

Patents cover a design or idea itself. Unlike copyrights, patents have to be registered, and have to be registered for each jurisdiction individually. Patents don't explicitly cover derivative works, but a patent based on another may infringe on the original. Patents often infringe on other patents, and such infringements are mutual. Neither infringing patent has greater power.

2.1 Justifications for IP law

The US constitution makes provision for IP in the clause that states "The Congress shall have the power...to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive rights to their respective writings and discoveries". (US Constitution). Economically, it has been argued that the market will not usually produce non-rival[1], non-excludable[2] goods (Mohr & Fourie, 2004:387). Intellectual property is intrinsically non-rival (Romer, 1996:204) and, in the absence of IP laws, non-excludable. IP laws are an attempt to provide an incentive for the production of intellectual property, by making it excludable.

This highlights one of the major justifications for IP laws: to promote innovation. The other major justification for patents is that they make public knowledge that would otherwise have remained a trade secret.

2.2 Consequences of IP law

Corporations exist to maximise shareholder value, primarily though maximising profits. Corporations can realise a greater profit if they can exclude competition and create a

[1] A **non-rival** good's consumption by one party does not reduce its consumption by others.
[2] A good is **non-excludable** if there is no way of restricting its consumption once it has been produced.

monopoly. Since patents grant the right to exclude others from exploiting a design or idea, they are a legal method for establishing a monopoly. The pharmaceutical industry in particular depends on patents to increase the price of their products. When pharmaceutical patents expire, generic drug makers often produce identical drugs at a far lower cost.

Patents also inflate the prices of products not produced by the patent holder. Included in the price of each copy of Microsoft Windows is at least $20 for patent royalties. (Software Freedom Law Center, 2007). Heller (1997) has identified a situation known as a "tragedy of the anticommons": when multiple parties can each exclude others from a scarce resource, leading to under-use of the resource. It is not uncommon for this situation to occur when multiple patents cover the same idea. This can lead to a situation where an idea cannot be commercially exploited, since too many parties hold an interest in that idea and they either cannot coordinate effectively, or the combined licensing fees make its production uneconomical.

According to Parloff (2007), the US Supreme Court has effectively stated that "patents have been issued too readily for the past two decades, and lots are probably invalid."

3. The information age

3.1 The economic nature of information

Economically speaking, in the absence of copyright and patent restrictions, information is a public good[3]. Since they are non-excludable, public goods typically have no economic value. This makes it difficult, if not impossible, to get a return on investment for producing public goods. Economic theory therefore predicts that the free market will usually not produce such goods. IP laws allow information goods to be made excludable, turning them into something more like a mixed good[4]. This allows information producers to get a return on their investment. However, the **efficient** use of a mixed good requires a zero price, since the marginal cost of adding another user is zero. (Mohr & Fourie, 2004:387)

This leads to a startling conclusion: either information goods are public goods and have no economic value, or they are mixed goods and require a zero price in order to be used efficiently.

3.2 Information gift economies

The Internet has greatly reduced the cost of collecting and distributing information. Organisations such as the FSF, Wikimedia, the Creative Commons and SourceForge have enabled several communities to emerge that are efficiently producing information goods. Everything from news, fiction, textbooks, and full-fledged operating systems to reference works like encyclopaedias and dictionaries are all freely available online. The crucial aspect of these works is that they have waived their copyright restrictions, granting the right to freely use, modify and redistribute those works. They have effectively reverted to public goods. Despite the economic prediction, these products do get produced, and in great quantity.

[3] **Public goods** are identified by two characteristics: they are non-rival and non-excludable.
[4] **Mixed goods** are non-rival but excludable.

Free content communities constitute gift economies. Unlike traditional gift economies, which have implicit obligations, the obligations in information gift economies are made explicit in copyleft licences. A key obligation is to ensure the freedom of future contributions.

Most of these communities produce information goods from the contributions of volunteers. The return for an individual contribution is invariably more than the individual amount contributed. This is the result of a network externality (Begg, Fischer & Dornbusch, 2003). A network externality occurs when the value of a network grows exponentially as the number of nodes on that network grows linearly. In the case of open content projects, the cost of producing the information drops exponentially as the number of contributions grow, while the utility value of the information that increasing exponentially. By treating information as economically valueless, but sharing the cost of production across the entire network, network externalities allow information to be produced efficiently and inexpensively.

4. The need for an anti-patent

4.1 Advantages of less IP

There are benefits of removing copyright restrictions which extend beyond information gift networks: Flint (2000) and Doctorow (2004, 2005) state that releasing the full text of books on the Internet for free actually generates more sales of printed books. For any copyrightable work, copyleft licences now exist which allow authors to specify what obligations apply to their works. It is also possible to stipulate that such a license will automatically apply to any derivative works. However, nothing comparable to copyleft licenses exists for patentable designs or ideas.

In 1979, gemmologist David Minster pioneered the use of yellow LEDs as a light source for refractometers (Minster, 2007). Instead of patenting his invention, he decided to release the information to the public domain. Later, several other inventors made minor improvements to the light source, but patented these improvements. By putting the details of his invention in the public domain, he had hoped to generate an obligation for reciprocation. He expected that other improvements to his invention would likewise be donated to the public domain. Subsequent inventors, however, violated this implicit obligation by patenting their improvements on the design.

If copyleft licences can make the obligation to reciprocate explicit, then a similar mechanism can be developed for patents.

4.2 Challenges to implementing an anti-patent system

Companies like IBM and Microsoft can pledge not to enforce their patents, but nothing legally enforces them to keep these pledges. And IP Holding companies, like the Open Innovation Network, similarly have nothing that will stop them from breaking their pledges to keep their patents free, should it ever become profitable not to do so.

4.3 The anti-patent license

If a licence similar to a copyleft licence was drawn up for patents, and submitted with

the patent, then the patent office would ensure its publication. Any party attempting to patent a derivative or infringing patent would automatically not be allowed to exploit their patent, unless they licence their patent under identical terms.

An example licence might include sections to the following effect:

ANTI-PATENT LICENCE
1. This design/patent is available for FREE USE by anyone as long as:
A. Proper ATTRIBUTION for designs is given (Attribution)
B. No improvements to this design is kept as a TRADE SECRET

2. Anyone can FREELY patent derivatives as long as:
A. Derivatives are covered by this exact same licence (Sharealike)

3. This licence is NON-REVOKABLE

4.4 Consequences of an anti-patent system

This initial attempt at an anti-patent uses licences within patent law to achieve the same ends as copyleft licences. This alternative to patenting may even be allowed to proceed without registration, in the manner of copyrights, in order to facilitate innovation, and the publication of innovation. These are the two major justifications for the existing patent system.

However, even applying this anti-patent license provides no guarantee that derivative ideas will remain freely available. Infringing patents could refuse to apply the same license. This would make it impossible for the patent holder to exploit their patent, but it would also encumber the use and development of the anti-patented idea.

An anti-patent system should provide a healthy alternative to the negative aspects of the existing patent system. If the free market does not produce public goods, then anti-patents will have no negative effect since they will never be used. If the anti-patent system gets used more than expected, then that means that the market can produce public goods, and that the justifications for the patent system are actually invalid.

4.5 Advantages of an anti-patent system

4.5.1 Advantages to innovators

Innovators may get their incentive by directly being paid to innovate, instead of trying to earn a return on investment. This is already happening with bounty sourcing, where consumers place bounties on problems they need solved. Anyone is allowed to propose a solution to any of the problems. Bounties are paid out for solutions that work.

4.5.1 Advantages to consumers

A reduction in patent licensing fees may result in lower costs to the consumer. Further, in a market full of anti-patents businesses would not be able to create artificial monopolies by owning the design of a product. This could lead to manufacturing and research differentiating as core businesses, resulting in market competition to produce goods with maximum efficiency, again lowering costs to consumers. Finally, if products'

designs were freely available, consumers could more readily customise these designs to precisely meet their own unique needs.

4.5.2 Advantages to business

Anti-patented designs could completely remove patent licensing fees as an expense for businesses. Research and development (R&D) might then separate from manufacturing, avoiding a situation where an inefficient manufacturing company is able to subsidise its excessive production expenses by using patents to prevent competition. Similarly, efficient manufacturers need not be prevented from manufacturing products more efficiently than its inventors. Either scenario would increase the value of the business to its shareholders. Finally, corporations' could find their market research expenditure reduced and a reduced risk that there would be no demand for their products; consumers could create their own customised designs, allowing the market itself to adapt products to market demand.

As for whether a manufacturing company could exist in an economy full of anti-patent designs, we will leave you with a concrete example: Slim Devices is an open organisation that has outsourced their research and design division to the Internet. Their product designs are fully and completely open, and community members do most of the development. This company is producing tangible open-source hardware, not just software or encyclopaedia articles.

Eventually they may need to be covered by anti-patents to ensure that they can continue freely making and using improvements to their products.

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