Adviesraad voor het
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Executive summary

Intellectual Property Right Regimes: The Socio-Economic Rationale

Intellectual property rights (IPR) have been created as economic mechanisms to facilitate ongoing innovation by granting inventors a temporary monopoly in return for disclosure of technical know-how. Since the beginning of 1980s, IPR have come under scrutiny as new technological paradigms appeared with the emergence of knowledge-based industries.
Knowledge-based products are intangible, non-excludable and non-rivalrous goods. Consequently, it is difficult for their creators to control their dissemination and use. In particular, many information goods are based on network externalities and on the creation of market standards. At the same time, information technologies are generic in the sense of being useful in many places in the economy.
Hence, policy makers often define current IPR regimes in the context of new technologies as both over- and under-protective. They are over-protective in the sense that they prevent the dissemination of information which has a very high social value; they are under-protective in the sense that they do not provide strong control over the appropriation of rents from their invention and thus may not provide strong incentives to innovate.
During the 1980s, attempts to assess the role of IPR in the process of technological learning have found that even though firms in high-tech sectors do use patents as part of their strategy for intellectual property protection, the reliance of these sectors on patents as an information source for innovation is lower than in traditional industries.
Intellectual property rights are based mainly on patents for technical inventions and on copyrights for artistic works. Patents are granted only if inventions display minimal levels of utility, novelty and non-obviousness of technical know-how. By contrast, copyrights protect only final works and their derivatives, but guarantee protection for longer periods, according to the Berne Convention.
Licensing is a legal aid that allows the use of patented technology by other firms, in return for royalty fees paid to the inventor. Licensing can be contracted on an exclusive or non-exclusive basis, but in most countries patented knowledge can be exclusively held by its inventors, as legal provisions for compulsory licensing of technologies do not exist.
The fair use doctrine aims to prevent formation of perfect monopolies over technological fields and copyrighted artefacts as a result of IPR application. Hence, the use of patented and copyrighted works is permissible in academic research, education and the development of technologies that are complimentary to core technologies.
Trade secrecy is meant to prevent inadvertent technology transfer to rival firms and is based on contracts between companies and employees. However, as trade secrets prohibit transfer of knowledge within industries, regulators have attemp-ted to foster disclosure of technical know-how by institutional means of patents, copyrights and *sui-generis* laws. And indeed, following the provisions formed by IPR regulation, firms have shifted from methods of trade secrecy towards paten-ting strategies to achieve improved protection of intellectual property, as well as means to acquire competitive advantages in the market by monopolization of technological advances.

Aspects of Software Protection: Patents and Copyrights

Since the 1960s software has radically changed, in both technological and social aspects. Software applications, originally developed for academic use have gradually been commercialized, while diffusing to industry and to the private sector.
In parallel, as technological capabilities evolved, software products that previously were implemented on a central computer have shifted to personal computer technology, and later, from a "stand alone" concept to network use. Consequently, software distribution has changed from applications bundled with hardware products toward mass-production goods sold independently.
In order to address the needs for protecting software as intellectual property, the "*idea/expression*" doctrine was adopted by the US Patent and Trademark Office (USPTO). Software is now legally perceived as a hybrid entity that enjoys both copyrights for final applications and patent protection for ideas and algo-rithms embedded in the technology. However, this legislative approach is strongly criticized as over-protective, as patents and copyrights overlap in protecting software inventions. Further, software users may lock-in to a standardized patented platform, and thus inadvertently grant monopoly power over innovation.
In contrast, the present regime is also regarded as under-protective when one considers the emerging scale of software piracy and unauthorized duplications. Therefore, we can reasonably conclude that the current legislation for software IPR, and in particular software patents, fails to construct an adequate protection for software goods, and moreover may hinder the pace of innovation in informa-tion technologies.

Patenting Biotechnology

Biotechnology has developed relatively recently with its modern patterns — molecular biology and genetic research — appearing in the early 1970s. Since its very beginning, the significance of technology transfer and knowledge diffusion from public institutions to the private sector was known. Moreover, scientific know-how, generated through basic research, was successfully applied in commercial applications.
Until the end of the 1970s a common approach had supported disclosure of results at no cost from all research that was publicly-funded. However, since the approval of the *Bayh-Dole Act* in 1980, research results are no longer regarded as public goods. The aim of the Act is to promote collaboration between academy and industry and hence to utilize scientific discoveries and to foster R&D. Private firms are obliged to pay royalties for use of patented knowledge, on the basis of exclusive licensing, *non-exclusive* licensing or "*reach-through*" agreements.
Research tools and gene sequences are at the forefront of molecular technology and a shift in the balance between preservation of IPR and the requirements of disclosure may affect the trajectory along which biotechnology evolves.
despite the goal of increasing social welfare by application of research tools and gene sequences in biotechnology, the ability to patent scientific discoveries and results of basic research in these fields may grant monopolies over a wide range of applications.
Though the *EU Directive on Legal Protection of Biotechnological Inventions*, driven by moral and ethical perspectives, presents a restrictive approach towards patents of human gene, and the US regulation applies narrower standards for DNA patenting, both regimes may hazardously impede innovation in biotechnology.

Consequences of Globalization and IPR

Countries can formulate their national IPR regimes by adopting some harmonized regime and adapting it to their needs, or by formation of differentiated (original) regimes. In the former case, IPRs are based on international agreements and conventions that are narrow enough to be applied and still broad enough to accommodate the legal peculiarities in the national legislation. The latter does not explicitly follow any international agreements.

In principle, harmonized (or uniform) regimes should create international coherence within the IPR system, and thus should stimulate innovation at a global level. Moreover, harmonized regimes are based on experience that has been accumulated by international organizations such as World Intellectual Property Organization (WIPO) and World Trade Organization (WTO), and that enables less developed countries lacking IPR policies to adopt an international doctrine. Yet a harmonized regime is a narrow standard, derived from the lowest common denominator between various national regimes.

By contrast, differentiated regimes better address the peculiar needs of parti cular countries and can be articulated to facilitate innovation in niche technologies at a national level. However, as they imply country-specific legislation, international corporations and knowledge transfer across borders may be hindered.

Although there is no clear evidence of the superiority of one type of regime over the other, the TRIPs agreement has defined not only the guidelines for harmonized IPR regimes, but also its adoption as a precondition for international trade. TRIPs aimed to regulate the balance between the rights of suppliers of traded technologies and their users, but since its approval it has been criticized as an agreement that follows the legislation of industrialized countries to assure their dominance of global markets, leaving less developed countries to lag behind.

Copyright Enforcement over the Internet

Among the allowances granted to copyright holders by the Berne Convention are the right to reproduce a work and the right to prepare derivatives on the basis of the original work. The applicability of both rights is called into question as the use of the World Wide Web (WWW) becomes a common means of diffusion and distribution.

The WWW is an open platform that creates full connectivity between objects by hyperlinking and by pointing to other webpages. It provides an ability for creating inter-linked material and for direct links to contents, by-passing the "author’s logic" formed in websites. Thus, by the nature of Internet technology, web-designers can "free-ride" on contents by creating links from their homepages to referred web addresses. Yet, consideration of hyperlinking as copyright infringement, judged by the criterion of unauthorized creation of derivatives, is questionable, as external websites do not hold copies of contents but only point to them.

On the other hand, under a strict interpretation of current legislation, web browsing would be considered copyright infringement since contents are reproduced in the computer’s Rapid Access Memory (RAM) or on the disk to be pre- sented on the screen. From a legal perspective, Internet users generate a series of unauthorized though inadvertent reproductions while surfing the Web.

Judgements are based on old definitions, or attempt to address those issues by likening the WWW cyberspace to physical entities, such as huge libraries.

However, under the present legislation users infringe the copyrights of a work just by viewing it. Clearly, the legislation that resolves today’s issues by outdated means calls for a formation of new definitions to regulate properly IPR over the Internet.

Aspects of Information Ownership and Legislation of Database Protection

IPR of databases often distinguish the method of organization that is patent-protected, original contents that are copyright-protected by the Berne

Convention, facts that do not enjoy copyrights as no intellectual or creative effort is involved in their collection, and collections and anthologies of works that are not copyrightable as their contents are copyrighted by themselves.

The US statutes are based on the case of *Feist (*1991), by which databases are copyrighted only if "a minimal degree of creativity" is involved in their production. Since then, although duplication of factual databases was permitted in the

US and European producers appeared to gain a competitive advantage, the US information industry holds the lion's share of the global market.
The *EU Database Directive*, approved in 1996, intended to create intellectual property provisions for the uncopyrighted contents in the form of a sui-generis law. Critiques of the EU Directive mention that it grants legal protection only in countries that apply a similar regime and therefore US databases are excluded from protection in Europe. Moreover, the Directive was approved in contradiction to WIPO's guidelines of harmonized IPR regimes and avoidance of international variations.
Finally, as scientific research relies on data processing to test and to generate new hypotheses, we evaluate the effects of information ownership granted by the EU Directive on science and technology. Most concerns relate to the influence of the Directive on accessibility of online databases and of the contents of digitized libraries.