

*A Critique of the Rapporteur's Explanatory Statement accompanying
the JURI Report to the European Parliament on the proposed
Directive on the Patentability of Computer-Implemented Inventions¹*

The present document, written jointly by scholars specializing in the economics of innovation and intellectual property, critiques and corrects misleading impressions conveyed by the Explanatory Statement that appears in the JURI report to the European Parliament, especially those pertaining to the interpretation of the existing economic research evidence on patents' role in stimulating software innovations.

Inasmuch as the rapporteur's explanatory statement in the JURI report is the document that will introduce the directive to many members of the Parliament who are unfamiliar with the subject, the imbalance and incompleteness of the analysis it offers is extremely unfortunate.² Because the proposed directive's terms are treated as matters of political compromise, economic issues that deserve careful consideration are glossed over, and the many problematic aspects of software patents that are now becoming manifest in the United States are entirely ignored. Indeed, a number of these problems were raised in the economics section of the study conducted for the Commission by the Intellectual Property Institute and, after the publication of the proposed directive, in the Parliament's own commissioned study, "The Patentability of Computer Programs," prepared by the Institute for Information Law at the University of Amsterdam.³

Critique

The explanatory statement opens by reciting the large number of patents granted for computer-related inventions (not limited to computer programs) as evidence of the demand for patents. This is dangerously misleading without a proper understanding of the context, as is the suggestion later in the document that companies with substantial software-related research may be expected to spend 5-10% of R&D on patenting.

¹ JURI report A5-0238/2003, 18 June 2003. (Page 4: Draft European Parliament Legislative Resolution; Page 20: Explanatory Statement [by Rapporteur Arlene McCarthy]; Page 24: ITRE Opinion [with proposed amendments]; Page 36: CULT Opinion [with proposed amendments]) <http://www2.europarl.eu.int/omk/sipade2?PUBREF=-//EP//TEXT+REPORT+A5-2003-0238+0+DOC+XML+V0//EN&L=EN&LEVEL=2&NAV=S&LSTDOC=Y>
For the original draft directive, see European Commission, Draft Directive on the Patentability of Computer-Implemented Inventions, 20 February 2002. http://www.europa.eu.int/comm/internal_market/en/indprop/comp/index.htm

² For a broader review of the economic issues and research literature, see the working paper "Should Europe encourage more patenting of software?: a research-based primer for policy-makers" by P. A. David, D. Foray, B. H. Hall, B. Kahin and W. E. Steinmueller, available at <http://www.researchineurope.org/draft/review.pdf>.

³ Bakels, Reinier, and P. Bernt Hugenholtz, "The Patentability of Computer Programs," Institute for Information Law, 24 July 2002, commissioned by the Committee on Legal Affairs and the Internal Market of the European Parliament. <http://www.ivir.nl/publications/other/softwarepatent.html>
See also Bakels, Reinier, L.M.C.R. Guibault & P. Bernt Hugenholtz, Testimony, Institute for Information Law, University of Amsterdam, at the European Parliament Hearing on Software Patentability, 7 November 2002. http://www.europarl.eu.int/hearings/20021107/juri/bakels_en.pdf

Both higher numbers of patents and high expenditures on patents may be symptomatic of strategic portfolio building. As the CEO of an SME testified at the FTC/DOJ hearings:

“I have no idea whether my product infringes on upwards of 120 different patents, all of which are held by large companies who could sue me without thinking about it. The end result, much like Borland, I have now issued a directive that we reallocate roughly 20 to 35 percent of our developers’ resources and sign on two separate law firms to increase our patent portfolio to be able to engage in the patent spew conflict.”⁴

In the same hearings, Robert Barr, Vice President of Cisco, said

“Where the patent system enables true innovation, true progress, where it enables companies to bring new products to consumers in circumstances where they otherwise would not do it, or where it disseminates knowledge that others need and want, then it’s working. There are certainly examples of industries where it serves these purposes, and these benefits must be preserved. But in my experience at Cisco and my prior experience representing a variety of companies, the negative effects of stockpiling patents, the consequences of innocent infringement through independent development, the cost of proving non-infringement or invalidity through patent litigation and the exploitation of the patent system as a revenue generating tool in its own right have hindered true innovation and outweighed the benefits.”⁵

Both executives are responding to the fact that the patenting increase in the computing and communications technology area in the United States has been driven by the strategic motive of piling up patents for defensive use and use in cross-licensing negotiations and not by the need to secure returns to innovation.⁶ It is noteworthy that the majority of U.S. patents in software technology are not taken out by package software publishers, but by hardware manufacturers plus IBM (which is classified as a computing service provider).⁷ The growth in patenting in this areas is

⁴ R. Jordan Greenhall, Chief Executive Officer, Divx Networks, 27 February 2002, <http://www.ftc.gov/opp/intellect/020227trans.pdf>

⁵ Robert Barr, Vice President, Worldwide Patent Counsel, Cisco, FTC Roundtable on Competition, Economic, And Business Perspectives On Substantive Patent Law Issues: Non-Obviousness And Other Patentability Criteria, 30 October 2002, <http://www.ftc.gov/opp/intellect/barrrobert.doc>

⁶ Among others, see B. H. Hall and R. H. Ziedonis, “The Patent Paradox Revisited: An Empirical Study of Patenting in the U.S. Semiconductor Industry, 1979-1995” (*Rand Journal of Economics* 32(2001): 101-128) on semiconductors and J. Bessen and R. M. Hunt, “An Empirical Look at Software Patents,” (MIT and the Federal Reserve Bank of Philadelphia: working paper, 2003) on software (<http://www.researchoninnovation.org/swpat.pdf>). Also see the survey evidence for U.S. firms reported in Cohen, W. M., R. R. Nelson, and J. P. Walsh. 2000. “Protecting Their Intellectual Assets: Appropriability Conditions and Why Firms Patent or Not?” NBER Working Paper No. 7552.

⁷ Bessen and Hunt (op. cit.) report that the manufacturing sector holds 69% of the software patents held by U.S. firms and has 10% of the programmers, whereas the non-manufacturing sector, including software publishers and IBM, holds 31% of the software patents and has 90% of the programmers. IBM alone has 8% of all software patents held by U.S. firms.

disproportionately driven by large U.S. firms involved in the manufacture of semiconductors, computers, and communications equipment, who are amassing patents specifically for defensive purposes as described by both the speakers quoted above.⁸ While cross-licensing is commonplace among the large companies, many are now using their portfolios to extract offset fees from companies that bring smaller portfolios to the table.

Section 2 of the rapporteur's statement discusses the need for patent protection in software. It concludes with the following rationale for software patents: "It would be wrong to discriminate against software developers by refusing them the patent protection available to other inventors when all the conditions for patentability are present." The European Parliament should not need to be reminded that the purpose of the patent system is to encourage investment in technological innovation and economic growth, and not to establish equitable treatment for all forms of human enterprise that conceivably could be granted legal monopoly rights by this device. A similar argument could have been applied to scientific discoveries such as the first and second laws of thermodynamics or to theorems derived from the axioms of Euclidean geometry, but there seems to be universal agreement to deny patentability to scientific discoveries, presumably because it is thought that granting patents on such discoveries would greatly retard scientific progress.

Section 3 of the rapporteur's statement cites the familiar argument that the directive will reduce legal uncertainty by rephrasing the standard of patentability, and indeed this is an admirable goal. Nevertheless, the statement contains no explanation of why this standard will be any more secure against administrative and judicial erosion than was the U.S. standard. Nor is there a response to the view expressed by the experts at the Institute for Information Law that the proposed language of the directive actually would increase legal uncertainty.⁹ Even in the U.S., where technicality is not a limitation, it is evident from testimony at the FTC/Department of Justice hearings [2002] that in practice very great uncertainties surround the scope, reach, and effect of information-goods patents.¹⁰

Section 4 of the statement concerns the impact on small and medium-sized software developers, which is perhaps the area with the most serious cause for concern, both with respect to the positive and negative effects of software patentability.¹¹ The statement relies heavily on a single undocumented sentence from the Intellectual

⁸ Hall, Bronwyn H. "Exploring the Patent Explosion," paper presented at the ZEW Workshop on Empirical Economics of Innovation and Patenting, Mannheim, March 2003.

⁹ Bakels, Guibault, and Hugenholtz, *op. cit.*

¹⁰ FTC/DOJ Hearings to Highlight Business and Economic Perspectives on Competition and Intellectual Property Policy, 20-24 February 2002, Berkeley, California.
<http://www.ftc.gov/opa/2002/02/ipsecond.htm>

¹¹ We find the opening argument of this section confused, especially the indication that European developers will be disadvantaged in the U.S. if the directive is not enacted. Patents and patent laws are territorial, and European developers will naturally be disadvantaged in the U.S. to the extent they ignore U.S. laws and practices. The question before the Parliament is whether European developers will be disadvantaged in Europe.

Property Institute: “the patentability of computer program related inventions has helped the growth of computer program related industries in the States, in particular the growth of SMEs and independent software developers into sizeable indeed major companies.”¹² A close reading of the IPI study reveals that there is no basis for such a broad conclusion either in the study itself or in the relevant empirical findings reported by the academic economics research literature. By omitting the caveats that appear in the IPI study’s discussion of this issue, the statement conveys a seriously misleading picture of the likely impact of software patents on SMEs in the European Union and the new accession States.

While it is generally accepted that patents support niche entry in information technology markets as in other fields, the widespread development of strategic patent portfolio-building practices within the ICT sector limits the ability of small companies to grow in competition with large companies.¹³ Small companies are disadvantaged in using the patent system in complex technologies, because many patent licenses are required to assemble complex products, and also because considerable legal resources are needed to credibly assert and defend against patents. As a recent report from the National Academy of Sciences in the U.S. concluded: “[D]eveloping and deploying software and systems may cease to be a cottage industry because of the need for access to cross-licensing agreements and the legal protection of large corporations.”¹⁴

The anecdote in this section about the SME issuing a non-exclusive license to a large multinational enterprise is cited as evidence of the importance of small firm innovation to large firms. But there is another interpretation: rather than evidencing the good will of SMEs toward large companies, such non-exclusive licensing often takes place when SMEs are found to be inadvertently infringing patents in a large company’s portfolio. Typically, the large company demands access to the SME’s technology in return for providing access to patents that the SME needs. Not only does the SME lose exclusivity in its intellectual property, but it is commonly required to make a side payment to the cross-licensing large entity in acknowledgment of its much larger patent portfolio.

The rapporteur’s statement overlooks these issues, and similarly omits consideration of the liabilities and high costs of using patent information to guide R&D investment strategy. It fails to acknowledge properly the disaffection that small companies with

¹² Robert Hart, Peter Holmes, and John Reid, "The Economic Impact of Patentability of Computer Programs," Intellectual Property Institute, London, 19 October 2000.
http://www.europa.eu.int/comm/internal_market/en/indprop/comp/studyintro.htm

¹³ This is a separate finding of the IPI study based on the economic section of the study. See also Bakels and Hugenholtz, *op cit*. The practice of “cross licensing” may create a barrier for small and medium-sized enterprises, as SMEs typically do not own a patent portfolio of sufficient size to participate in this game. See William Kingston, “Innovation Needs Patents Reform” (*Research Policy* 30 (2001): 403-23)

¹⁴ National Academy of Sciences, *The Digital Dilemma: Intellectual Property in the Information Age*, (Washington, D. C.: National Academy Press, 2000), p. 198. See also P. Tang, J. Adams & D. Paré, Patent Protection for Computer Programmes, 2001 (commissioned by DG Enterprise), <http://www.aerosme.com/download/softstudy.pdf>, and more generally, the studies in the UMIST Intellectual Property Initiative, at <http://info.sm.umist.ac.uk/esrcip/>

experience in the workings of the system express in regard to patenting in general, and toward software patents in particular.¹⁵ Much of this is due to the very high costs of pursuing, enforcing, and defending against patents. As the authors of the Institute for Information Law study observed in testimony to the Parliament: “in practice, patents are widely used to fight competitors with legal means rather than with product superiority.”¹⁶

The SCO actions against Linux should remind policymakers that exploitation of intellectual property is not limited to the protection of going businesses. As a weapon, intellectual property is used most effectively by companies that have no going business and therefore little to lose from uninhibited aggression. They wield the most power when their property claims have been inadvertently embedded in the systems of millions of business so as to cause widespread uncertainty among sectors that are mere users of technology. This prospect of economy-wide liability argues strongly for a strict interpretation of the technicality requirement that limits patents to the scope of the technical contribution. This would limit speculation in software patents by largely confining their application to technical fields where there is more likely to be awareness of relevant patents and less temptation to assert patents against unknowing and unsophisticated users. Ideally, this would eliminate the risk of inadvertent infringement in the basic information processing functionality of operating systems and common applications such as word processors.

More generally, the rapporteur’s statement fails to address the potential negative economic effects of large portfolios on the competitive structure of an industry characterized by strong economies of scale and network effects. Software patents readily may multiply instances of monopoly control over compatibility interfaces in computer code, thereby opening the way for the abuse of market power over “essential facilities” – and expanding the problems with which the competition authorities would have to contend. We appreciate the JURI committee's efforts to address this by amending Article 6 to ensure that patents (like copyright) cannot be used to block interoperability by complements, but note that this does not preclude the use of patents to pre-empt critical functions within a general-purpose information infrastructure.

The most serious error in interpreting the economic evidence is perhaps that in section 5, where the rapporteur’s statement asserts that “academic studies have shown a link between R&D spending, patent applications, and productivity.” No documentation for this claim is provided. In fact, what is known via academic research is that although a firm’s R&D spending is clearly related to its productivity, profitability, or market value, there is little evidence that patents contribute *separately* to performance, that is, above and beyond R&D spending.¹⁷ Direct survey evidence for the United States and

¹⁵ “SMEs apparently do not like patents at all, despite extensive promotion efforts by proponents of the patent system.” IVIR, *The Patentability of Computer Programs*, p. 43.

¹⁶ Bakels, Guibault, and Hugenholtz, op. cit., p. 3.

¹⁷ See the papers in Z. Griliches, *R&D, Patents, and Productivity* (Chicago University Press, 1984) and the critical survey by B. H. Hall, “The Private and Social Returns to Research and Development: What Have We Learned?,” in Smith, Bruce L. R., and Claude E. Barfield (eds.), *Technology, R&D, and the Economy* (Washington, DC: The Brookings Institution and the American Enterprise Institute, 1996).

Europe has found that patents are only considered important for securing returns to innovation in the specialty chemicals industry including pharmaceuticals, medical instruments, and specialized machinery.¹⁸

In the study already cited that explicitly focused on software patents, Bessen and Hunt found that the correlation between R&D and patenting in the U.S. over time has been significantly *negative*. In other words, as software patenting rates have risen, R&D investment in sectors using information technologies has declined. Whether there is an underlying causal relationship remains unestablished, but the U.S. experience warrants scepticism regarding claims that software patenting would contribute to the goal of raising the software R&D investment rate in the European Research Area.

We appreciate the rapporteur's and the Parliament committees' concerns for monitoring the impact of software patents in Europe and the U.S. This should be done in a scientifically sound manner in which the methodology and conclusions are publicly debated. It must begin with a proper empirical baseline *before* the directive is implemented in order to understand the effects of the directive. Indeed, it should be done before the directive is enacted to ensure that the baseline is not prejudiced by business behaviour that anticipates implementation. As the Institute for Information Law study notes, there is grossly inadequate information about the functioning of patents in practice and a need for disinterested independent oversight, such as the proposed European Patent Observatory.¹⁹

Conclusions and discussion

This critique has been directed primarily at the rapporteur's statement rather than the Commission's original analysis, because 18 months have passed since the draft directive was issued. In the interim, there have been substantial additions to the record, such as the Institute for Information Law study, the FTC/DOJ hearings in the U.S., and the noteworthy empirical study of U.S. software patents by Bessen and Hunt. A number of conferences and seminars have been held on the economics of the patent system with special attention to software and services. None of this is reflected

For evidence on the relationship between patents, R&D, and firm performance, see Z. Griliches, A. Pakes, and B. H. Hall, "The Value of Patents as Indicators of Inventive Activity," in Dasgupta and Stoneman (eds.), *Economic Policy and Technological Performance* (Cambridge: Cambridge University Press, 1987).

¹⁸ For U.S. evidence, see Cohen et al, op. cit. as well as R. C. Levin, A. K. Klevorick, R. R. Nelson, and S. G. Winter, "Appropriating the Returns to Industrial R&D," *Brookings Papers on Economic Activity* (1987): 783-820. For Europe, see A. Arundel, "Patents in the Knowledge-Based Economy," *Beleidstudies Technology Economie* 37 (2001): 67-88.

¹⁹ See Bakels and Hugenholtz (2002). "Given these uncertainties, the priority should in our view not be on yet another European Directive, but rather on concerted efforts aimed at obtaining more insight in the way the patent system actually works. We do not advocate yet another consultation or study. Instead, we feel that there is a need for an agency that collects data about the operation of the patent system in a systematic fashion. Article 7 of the proposed directive deals with "monitoring". We would advocate the creation of a Patent Observatory that should collect patent system "management information" on a routine basis. Only such an Observatory could answer even such basic questions as whether patents are needed in specific industries – and for what type of inventions."

in the JURI rapporteur's statement, which is substantially unchanged from its original draft.

That said, it should be noted the Commission has been regrettably slow to provide balanced background analysis. While DG Internal Market is to be commended for ordering a study on the economic impact of patentability, this was only after the Commission had already taken a poorly explained position on the issue in its 1997 Green Paper²⁰ and its 1999 Communication.²¹ This made it difficult to embark on a study that could address the issue afresh with the resources and scope that it deserved.

Despite the promise implicit in its title, the small contract for the study was not awarded to one of Europe's many research institutes specializing in the economics of innovation, but to the legally oriented Intellectual Property Institute in London, which has no economists on staff and at best a limited record of conducting economic research. The economist brought in on the study did a respectable review of the literature in 11 pages, a minor fraction of the report, which as a whole dwelt extensively on legal issues.²² As noted, there were discrepancies between the economics section and the summary, yet the Commission did not provide for peer review, either in writing or through a public event. Nevertheless, the analysis in the memo that accompanies the Commission's draft directive is largely based on selected statements from the study and basically justifies the direction indicated in the 1997 and 1999 documents.

Most regrettably, Internal Market as the lead DG on intellectual property has failed to address the larger economic and institutional problems inherent in the patent system, even as it moves Europe toward the laudable goal of a community patent. Indeed, instead of making an effort to better understand how the system affects competition and innovation, it has invested resources in unabashedly promoting greater use of the system. In effect, this urges Europe into the kind of strategic portfolio building that operates as a limitation and barrier to small businesses in the U.S. To this end, the Commission jeopardized its reputation for objectivity by awarding a large contract to IBM, a company with a uniquely voluminous portfolio and a famously aggressive licensing program, to make recommendations on how national patent offices should promote patenting.²³

²⁰ *Promoting innovation through patents*, Green Paper on the Community patent and the patent system in Europe (1997).

²¹ *Promoting innovation through patents*, Communication from the Commission to the Council, the European Parliament and the Economic and Social Committee, February 1999. For the evolution of the Commission's position, see B. Kahin, "Information process patents in the U.S. and Europe: Policy avoidance and policy divergence," *First Monday*, volume 8, number 3, March 2003, http://www.firstmonday.org/issues/issue8_3/kahin/index.html

²² R. Hart, P. Holmes, and J. Reid, *op cit*.

²³ IBM Business Consulting Services B.V., Almere, Study on "The role of national patent offices, the European patent office as well as Japanese and US patent offices in promoting the patent system," 14 February 2003, http://europa.eu.int/comm/internal_market/en/indprop/patent/index.htm

In the same vein, the Commission has pursued planning for insurance to support patent enforcement through litigation, since it is known to be costly for SME. This, however, was premised on another misunderstanding of the U.S. situation. As the contracted study concluded: “The tacitly assumed successful and wide use of insurance in the USA proved to be illusory.” The investigation showed that the principal insurance market in the U.S. was for defensive insurance and that the insurers themselves were fearful of the risks involved.²⁴ Their concerns were remarkably consistent with the picture of patent minefields and attendant risk and uncertainty painted in the FTC/DOJ hearings.

Unfortunately, many in Europe continue to be enthralled by the American mythology of patents, and on that basis conclude that the best course must be to follow U.S. policy. But, instead of unquestioningly accepting self-interested and often biased interpretations of the U.S. experience, Europe’s interest will be far better served by expending the effort to thoroughly understand the business effects of software patents. Members of the European Parliament should insist on being informed by independent, critical assessment of the available evidence (including that from the U.S. during the 1990’s) and the likely benefits and costs of liberalizing the issuance of software patents, before committing the region’s economies to an institutional change that will prove very difficult to reverse.

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²⁴ “Contrary to received belief, the extent of Patent litigation insurance in the USA in relation to the extent of litigation appears to be small, and limited to defence, including damages.... If on a par with US patent risks, the likelihood that the EC can set up a healthy patent infringement insurance market is slim to nil.... Patent infringement insurance policies have not gained wide acceptance in the US. The reason is that insurers fear US patent risk. The policies the insurers are willing to offer to cover US patent risk offer very limited coverage.” (CJA Consultants Ltd, “The possible introduction of an insurance against costs for litigation in patent cases,” European Policy Advisers, Britain and Brussels 12 March 2003, Section 7.7, http://europa.eu.int/comm/internal_market/en/indprop/patent/docs/patent-litigation-insurance_en.pdf)