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JAMES E. BESSEN

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A comment on “Do Patents Facilitate Financing in the Software Industry?”

By James Bessen

(Boston University School of Law and Research on Innovation)

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Abstract: “Do Patents Facilitate Financing in the Software Industry?” by Ronald J. Mann contributes empirical evidence to our understanding of how software startups use patents. However, a close examination of the actual empirical findings in this paper points to rather different conclusions than those that Mann draws, namely: few software startups benefits from software patents and patents are not widely used by software firms to obtain venture financing. Indeed, among other things, the paper reports that 80% of venture-financed software startups had not acquired *any* patents within four years of receiving financing.

Keywords: Software, Patents, Startups, Innovation, Venture Capital

JEL classification: O34, M13, L86

In “Do Patents Facilitate Financing in the Software Industry?”¹, Ronald J. Mann contributes to our understanding of patents and software firms with evidence from a about 50 interviews and with citations from a larger, forthcoming empirical study with Tom Sager. This is important because, although courts have made dramatic changes in the treatment of software patents, until recently, little empirical evidence has been available to evaluate these changes.

Mann argues that for the software industry, “patents are more beneficial to small firms than to large firms.” He bases this conclusion on a mixture of theoretical considerations and this empirical evidence. However, a careful look at the actual empirical findings in the paper points to rather different conclusions. Moreover, other empirical evidence, in papers cited by Mann, is also inconsistent with his conclusion.

Mann’s principal argument is that

...a substantial number of software startups do have patents of sufficient strength to exclude competitors. That important finding, taken with the fact that the principal targets of those patents are much larger firms, suggests patents are more beneficial to small firms than to large firms. (pg. 962)

The evidence for this conclusion comes from the following paragraph:

...it is clear that *some* firms in the industry obtain a substantial amount of revenues by licensing the use of their patents to competitors that need to use the patented technology in their own products. Indeed, even in my limited sample, three small Austin companies—Applied Science Fiction, Bluecurrent, and Forgent—have obtained substantial revenues from patent licenses. I do not believe that industry wide statistics quantify the size of that market, but it plainly is substantial. Those transactions—and others like them—demonstrate that *some* software patents are sufficiently robust to allow their holders to appropriate substantial value from the underlying inventions. Licensing transactions are noteworthy given the difficulties small firms face in enforcing patents against large firms. (pp. 985-6, emphasis in the original)

¹ 83 Texas LR 961

There are several problems with this argument, however. First, it is dangerous to base conclusions on only three interview examples, especially because impressions obtained from interviews are not always accurate. In particular, Mann does not provide evidence of the actual licensing revenues from Applied Science Fiction and Bluecurrent, telling us, for Applied Science Fiction, that this information is not public. He relies instead on an interview with the former CEO who had been replaced three years earlier.² However, I can provide information about Applied Science Fiction because I was an investor in this startup, participating through a venture capital partnership (Sevin Rosen). Although Applied Science Fiction did do some technology licensing, I can report that patent licensing revenues were *not* substantial in any meaningful financial sense—I only wish they were, as the investment was written off entirely.³

The only actual quantitative evidence Mann cites regarding licensing revenues concerns Forgent, a company that has recently obtained tens of millions of dollars for a patent it acquired that was filed in 1986 and that reads on the JPEG image compression standard. Because large companies (and small) have widely adopted this standard since it was introduced in the 1980s, it is not surprising that Forgent has been able to obtain large settlements.

However, Forgent cannot be accurately classified as a “software startup.” Forgent began corporate life as Video Telecom (later “Vtel”) in 1985, a company producing videoconferencing systems, so although it might be called a “re-start,” it is hardly a

² “Applied Science Fiction Announces New Management Leadership,” press release, July 21, 2000, accessed at <http://www.strategic-triangle.com/pdf/ASFNew%20Leadership.doc> on 5/12/2005.

³Sevin Rosen annual reports and interview with Charles Phipps, 5/11/2005. Moreover, these were full technology licenses, *not* pure patent licenses, so it is not clear how much of the royalties can be attributed specifically to patents.

startup.⁴ In 1997 Vtel acquired Compression Labs, the firm that developed this patent that reads on the JPEG standard. But in 2002, Vtel divested its video products division, changed its name to Forgent Networks, and developed a new strategy focusing largely on licensing software patents. Forgent has since acquired two scheduling software companies. But Forgent's activities regarding image compression are those of a patent licensing business (that is, a "troll"), not those of a software developer—it offers no image compression software. Despite substantial patent revenues from companies using JPEG, Forgent's actual software business continues to shrink.⁵ In any case, this example has little to do with providing incentives for innovation among small startup firms—Compression Labs and Vtel apparently felt no incentive to attempt to assert this patent against users of the JPEG standard; they did not file suit against any of the many JPEG users and they supported the JPEG standard themselves.

Nevertheless, Mann is likely correct that *some* small software startups are able to extract significant licensing revenues from large firms. But this raises a second question: how representative are these firms of all software startups? The proposition that software startups generally benefit from patents more than large firms do implies that a substantial

⁴ Forgent's Investor Relations Corporate Overview, http://ir.forgent.com/ireye/ir_site.zhtml?ticker=FORG&script=2100 accessed May 2, 2005.

⁵ "Forgent ups its earnings for first time in year," Austin Business Journal, December 15, 2004, accessed from http://www.forgentnetworks.com/company/press_room/abj-12-15-04.shtml.

portion, if not *most*, small software firms benefit.⁶ But Mann's interview sample is not randomly selected.⁷

Mann asserts that there are "substantial numbers" of firms like his three examples, but he admits that there is no statistical evidence to support this assertion.⁸ However, other evidence in Mann's paper reveals that *most* startup software firms do *not* benefit from patents. We know this because Mann provides evidence that most small software startups *choose not* to get patents. If patents were valuable to them, they would acquire patents and plenty of them. But in a more comprehensive sample of 788 software startups, Mann reports that the mean number of total patents acquired was 0.6.⁹ And fully 80% of these software startups that received venture financing in 1998-99 had not acquired *any* patents by 2003.¹⁰ At the very least, this result (reported in a footnote), seems to place a major qualification on Mann's principal conclusion about the benefits of patents to small software firms, especially since large firms *do* acquire lots of software patents (see below).

These results are also consistent with findings regarding patents issued to individual inventors. Individual inventors receive 18% of non-software patents, but only

⁶ Clearly, one could also argue that only a few firms benefit, but that the associated social benefits are so large from these few that they outweigh any social losses associated with patents for other small software firms. But this is an entirely different argument than the one Mann makes and there does not seem to be evidence to support this argument.

⁷ "I focused several of my interviews on firms known to me to have commercially valuable patents (p. 989)."

⁸ "I do not believe that industry wide statistics quantify the size of that market, but it plainly is substantial (pg. 986)."

⁹ Mann, p. 988.

¹⁰ Mann, fn. 295. 51% of comparable biotech firms had patents in 2003, not counting patent licenses owned by universities.

11% of software patents.¹¹ And on average, the owners of software patents are larger firms than are the owners of non-software patents.¹² To the extent that individual inventors are also “startups,” this suggests a lower propensity for individuals to obtain software patents than for large firms. Bessen and Hunt also find that newly-public software firms—those just emerging from their startup status—are also much less likely to obtain software patents than other firms.¹³

Moreover, in answer to the question posed by the title of the paper, Mann concludes that there are many factors that facilitate the ability of startups to get funding, but that intellectual property “has a low place on the list of factors, if it appears on that list at all.”¹⁴ He bases this conclusion on work in an unpublished paper co-authored with Tom Sager. That paper regresses measures of firm financing (total investment and rounds of financing) against firm patent practices. Mann reports that “patenting practices have at best a minuscule ability to predict the success of a venture-backed software startup” including these financing measures.¹⁵ In other words, Mann’s evidence does not demonstrate that “patents facilitate financing in the software industry.”¹⁶ This is not surprising, given that so few venture-financed software firms actually get patents.

¹¹ Bessen, James and Robert M. Hunt, “An Empirical Look at Software Patents,” Working Paper 03-17R, Federal Reserve Bank of Philadelphia, 2004, Tables 2.

¹² Ibid, Table 3.

¹³ Ibid, Table 5, column 3.

¹⁴ Pp. 980-1.

¹⁵ Mann, fn. 104, pg. 981. The simplest regression found a relationship that is statistically significant but economically insignificant in magnitude. But when they controlled for firm duration in a more sophisticated regression, even that weak relationship was no longer statistically significant. Note that it is necessary to control for firm duration, because the longer a firm survives, the more opportunity it has to get financing and to get patents even though these may be independent actions.

¹⁶ Unfortunately, some observers have not read the footnotes carefully and have concluded that Mann’s paper provides evidence of a positive relationship between patents and financing, see Evans, David

Mann argues, based on theoretical considerations, that patents will become more valuable to software firms as they grow. But empirical evidence on public software firms suggests otherwise. Bessen and Hunt find that public software firms have a very low patent propensity compared to firms in other industries.¹⁷ Software firms get 1 patent for every \$10 million in R&D; electronics and instrument firms get 7 patents for every \$10 million in R&D. Moreover, controlling for firm size, R&D and a variety of other characteristics, an electronics firm will obtain nearly ten times as many software patents as a software firm (plus even more non-software patents).

Another way of looking at this issue is to ask, “who gets software patents?” Bessen and Hunt find that only 7% of software patents go to firms in the software publishing and software services industries (excluding IBM), but these industries employ 33% of the programmers and analysts. In fact, most software patents are acquired by large firms in computer, electronics and instrument industries.

All of this evidence seems consistent about how small software firms use patents. If patents really did help small software firms more than they help large firms, then small software firms would obtain lots of patents, both in absolute terms and also relative to large firms. But the evidence—both in Mann’s work and elsewhere—shows that most software startups don’t get patents, those that do patent get relatively few of them in general, small and mid-size public software firms also do not get many software patents

S. and Anne Layne-Farrar, “Software Patents And Open Source: The Battle Over Intellectual Property Rights,” 9 Va. J.L. & Tech. 10 (2004).

¹⁷ Op. cit., Tables 4 and 5. Note that if one uses a different definition of “software patent” developed by Stuart Graham and David Mowery, the results are very similar results to the ones reported here. The definition used in the Bessen-Hunt paper has been criticized by Robert Hahn and Scott Wallsten, “A Review of Bessen and Hunts Analysis of Software Patents,” unpublished 2003. See also, Bessen, James and Robert M. Hunt, “A Reply to Hahn & Wallsten,” at <http://www.researchoninnovation.org/hahn.pdf>.

on average, and software patents go disproportionately to large firms compared to other types of patents. Mann's empirical research contributes to our knowledge of software startup firms, but, unfortunately, his empirical findings appear to point in a different direction than his main conclusion.