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Pamela Samuelson

## Legally Speaking Why Do Software Startups Patent (or Not)?

*Assessing the controversial results of a recent empirical study of the role of intellectual property in software startups.*

**T**WO-THIRDS OF THE approximately 700 software entrepreneurs who participated in the 2008 Berkeley Patent Survey report that they neither have nor are seeking patents for innovations embodied in their products and services. These entrepreneurs rate patents as the least important mechanism among seven options for attaining competitive advantage. Even software startups that hold patents regard them as providing only a slight incentive to innovate.

These are three of the most striking findings from a recently published article, "High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey."<sup>1</sup> After providing some background about the survey, I will discuss some key findings about how software startup firms use and are affected by the patent system.

While the three findings highlighted above might seem to support a software patent abolitionist position, it is significant that one-third of the software entrepreneur respondents reported having or seeking patents, and that they perceive patents to be important to persons or firms from whom they hope to obtain financing.

### Some Background on the Survey

More than 1,300 high-technology entrepreneurs in the software, biotechnology, medical devices, and computer hardware fields completed the Berkeley Patent Survey. All of these firms were

no more than 10 years old before the survey was conducted. We drew our sample from a general population of high-tech firms registered with Dun & Bradstreet (D&B) and from the VentureXpert (VX) database that has a rich data set on venture-backed startups. (Just over 500 of the survey software respondents were D&B firms; just under 200 respondents were VX firms.)

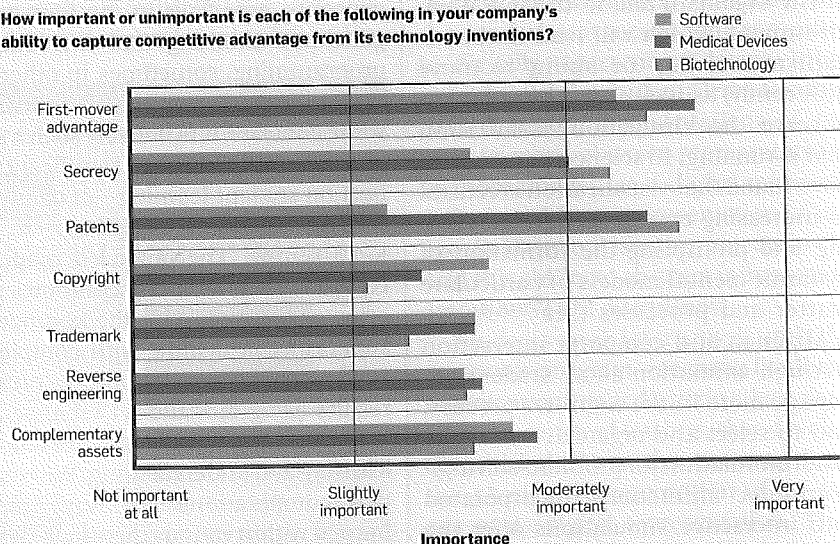
Eighty percent of the software respondents were either the CEOs or CTOs of their firms, and most had experience in previous startups. The average software firm had 58 employees, half of whom were engineers. Be-

tween 10%–15% of the software startup respondents among the D&B respondents were venture-backed firms. Among the software respondents, only 2% had experienced an initial public offering (IPO), while 9% had been acquired by another firm.

Our interest in conducting this survey arose because high-technology entrepreneurs have contributed significantly to economic growth in recent decades. They build firms that create new products, services, organizations, and opportunities for complementary economic activities. We were curious to know the extent to which high-tech

Measures of capturing "competitive advantage" from inventions.

How important or unimportant is each of the following in your company's ability to capture competitive advantage from its technology inventions?



startups were utilizing the patent system, as well as to learn their reasons for choosing to avail themselves of the patent system—or not.

The basic economic principle underlying the patent system is that technology innovations are often expensive, time-consuming, and risky to develop, although once developed, these innovations are often inexpensive and easy to copy; in the absence of intellectual property rights (IPRs), innovative high-tech firms may have insufficient incentives to invest in innovation insofar as they cannot recoup their research and development (R&D) expenses and justify further investments in innovation because of cheap copies that undermine the firms' recoupment strategy.

Although this economic principle applies to all companies, early-stage technology firms might, we conjectured, be more sensitive to IPRs than more mature firms. The former often lack various kinds of complementary assets (such as well-defined marketing channels and access to cheap credit) that the latter are more likely to enjoy. We decided it would be worthwhile to test this conjecture empirically. With generous funding from the Ewing Marion Kauffman Foundation, three colleagues and I designed and carried out the survey and have begun analyzing the results.

### Why Startups Patent

The most important reasons for seeking patents, as reported by software executives who responded to the Berkeley Patent Survey, were these: to prevent competitors from copying the innovation (2.3 on a 4 point scale, where 2 was moderately important), to enhance the firms' reputation (2.2), and to secure investment and improve the likelihood of an IPO (1.96 and 1.97 respectively).

The importance of patents to investors was also evident from survey data showing striking differences in the rate of patenting among the VX and the D&B software companies.

Three-quarters of the D&B firms had no patents and were not seeking them. Because the D&B firms are, we believe, fairly typical of the population of software startup firms in the U.S., their responses may well be representative of patenting rates among software startups generally. It is, in fact, possible

**It is an article of faith among many IP lawyers that patents provide significant incentives for firms to engage in R&D and develop new products.**

that the overall rate of software startup patenting is lower than this given that patent-holders may have been more likely than non-patent-holders to take time to fill out a Berkeley Patent Survey.

In striking contrast to the D&B respondents, over two-thirds of the VX software startup respondents in the sample, all venture-backed, had or were seeking patents. We cannot say why these venture-backed firms were more likely to seek patents than other firms. Perhaps venture capitalists (VCs) are urging firms they fund to seek patents; or VCs may be choosing to fund the development of software technologies that VCs think are more amenable to patenting.

Interestingly, the rate of patenting did not vary by the age of the firm (that is, older firms did not patent more than younger firms).

### Why Forego Patenting?

The survey asked two questions about decisions to forego patenting: For the last innovation for which the firm chose not to seek a patent, what factors influenced this decision, and what was the most important factor in the decision?

The costs of obtaining and of enforcing patents emerged as the first and second most frequent explanation. Twenty-eight percent of the software startup executives reported that the costs of obtaining patents had been the most important factor in this decision, and 12% said that the costs of enforcing patents was the most important factor. (They reported that average cost of getting a software patent was just under \$30,000.)

## Calendar of Events

November 17–19

**Asian Internet Engineering Conference,**  
Bangkok, Thailand,  
Contact: Kanchanasut Kanchana,  
Email: kk@cs.ait.ac.th

November 17–19

**Advances in Computer Entertainment Technology Conference,**  
Taipei, Taiwan,  
Contact: Duh Henry B.L.,  
Email: eldbl@nus.edu.sg

November 22–23

**Conference on Decision and Game Theory for Security,**  
Berlin, Germany,  
Contact: Tansu Alpcan,  
Email: alpcan@sec.t-labs.tu-berlin.de

November 22–24

**The 17<sup>th</sup> ACM Symposium on Virtual Reality Software and Technology,**  
Hong Kong,  
Contact: George Baciuc,  
Email: csgeorge@comp.polyu.edu.hk

December 1–3

**9<sup>th</sup> International Conference on Mobile and Ubiquitous Multimedia,**  
Limassol, Cyprus,  
Contact: Angelides Marios,  
Email: marios.angelides@brunel.ac.uk

December 4–8

**The 43<sup>rd</sup> Annual IEEE/ACM International Symposium on Microarchitecture,**  
Atlanta, GA,  
Sponsored: SIGMICRO,  
Contact: Sudhakar Yalamanchili,  
Email: suhdha@ece.gatech.edu

December 5–8

**Winter Simulation Conference,**  
Baltimore, Maryland,  
Sponsored: SIGSIM,  
Contact: Joe Hagan,  
Email: jhagan@gmail.com

December 12–13

**Virtual Reality Continuum and its Applications in Industry,**  
Seoul, Republic of Korea,  
Sponsored: SIGGRAPH,  
Contact: Hyunseung Yang,  
Email: hsyang@cs.kaist.ac.kr

Ease of inventing around the innovation and satisfaction with secrecy also influenced software startup decisions not to seek patents, although only rarely were these factors considered the most important.

Intriguingly, more than 40% of the software respondents cited the unpatentability of the invention as a factor in decisions to forego patenting. Almost a quarter of them rated this as the most important factor. Indeed, unpatentability ranked just behind costs of obtaining patents as the most frequently cited "most important factor" for not seeking patents.

It is difficult to know what to make of the unpatentability finding. One explanation may be that the software respondents believed that patent standards of novelty, non-obviousness, and the like are so rigorous that their innovation might not have satisfied patent requirements. Yet, because the patentability of software innovations has been contentious for decades, it may also be that a significant number of these entrepreneurs have philosophical or practical objections to patents in their field.

### How Important Are Patents to Competitive Advantage?

One of the most striking findings of our study is that software firms ranked patents dead last among seven strategies for attaining competitive advantage, as the accompanying figure shows. (The relative unimportance of patents for competitive advantage in the software field contrasts sharply with the perceived importance of patents in the biotech industry, where patents are ranked the most important means of attaining such advantage.)

As shown in the figure on page 30, software startups regard first-mover advantage as the single most important strategy for attaining competitive advantage. The next most important strategy was complementary assets (for example, providing services for licensed software or offering a proprietary complement to an open source program).

Among IPRs, copyrights and trademarks—closely followed by secrecy and difficulties of reverse engineering—outranked patents as means of attaining competitive advantage among software respondents by a statistically significant margin.

### What Incentive Effects Do Patents Have?

The Berkeley Patent survey asked startup executives to rate the incentive effects of patents on a scale, where 0 = no incentive, 1 = weak incentive, 2 = moderate incentive, and 3 = strong incentive, for engaging in four types of innovation: (1) inventing new products, processes, or services, (2) conducting initial R&D, (3) creating internal tools or processes, and (4) undertaking the risks and costs of commercializing the innovation.

We were surprised to discover the software respondents reported that patents provide only weak incentives for engaging in core activities, such as invention of new products (0.96) and commercialization (0.93). By contrast, biotech and medical device firms reported just above 2 (moderate incentives) for these same questions.

Interestingly, the results did not change significantly when considering only responses from software entrepreneurs whose firms hold at least one patent or application. Even patent-holding software entrepreneurs reported that patents provide just above a weak incentive for engaging in these innovation-related activities.

### Resolving a Paradox

If patents provide only weak incentives for investing in innovation among software startups, why did two-thirds of the VX respondents and at least one-quarter of the D&B respondents seeking patents? The answer may lie in the perception among software entrepreneurs that patents may be important to potential funders, such as VCs, angel investors, other firms, commercial banks, and friends and family. Sixty percent of software startup respondents who had negotiated with VCs reported that they perceived VC decisions about whether to make the investments to be affected by patents. Between 40% and 50% of the software respondents reported that patents were important to other types of investors, such as angels, investment banks, and other companies.

### Controversy Over Survey Findings

It is an article of faith among many IP lawyers that patents provide significant incentives for firms to engage in R&D and develop new products. Most would

also expect, as we did, that high-tech startup companies would regard patents as more important as an inducement to innovation than large firms, given that the latter have lots of other assets for achieving and maintaining success in the marketplace.

Anecdotes highlighting the importance of patents to high-tech entrepreneurs are relatively easy to find. Because data from the Berkeley Patent Survey suggests that software entrepreneurs regard patents as quite unimportant, the reaction of some prominent patent lawyers to our article about the survey has been sharply negative. We believe, however, that our analysis is sound and these critiques are off-base. We encourage readers to read the full article and make their own judgments.

### Future Research

Over the next several years, the co-authors of the Berkeley Patent Survey article expect to analyze further data from this survey and to report new findings. We will look more closely, for example, at differences in patenting rates among those in different sectors of the software industry and differences between patent holders and non-patent holders. We know already that product innovators seek patents more often than process innovators.

The findings reported here suggest that software entrepreneurs do not find persuasive the canonical story that patents provide strong incentives to engage in technology innovation. These executives regard first-mover advantage and complementary assets as more important than IPRs in conferring competitive advantage upon their firms. Moreover, among IPRs, copyrights and trademarks are perceived to be more important than patents. Still, about one-third of the software entrepreneur respondents reported having or seeking patents, and their perception that their investors care about patents seems to be a key factor in decisions to obtain patents. ©

### Reference

1. Graham, S.J.H., Merges, R.P., Samuelson, P., and Siegelman, T. High technology entrepreneurs and the patent system: Results of the 2008 Berkeley patent survey. *Berkeley Technology Law Journal* 25, 4 (2010), 1255–1327; [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1429049](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1429049).

**Pamela Samuelson** ([pam@law.berkeley.edu](mailto:pam@law.berkeley.edu)) is the Richard M. Sherman Distinguished Professor of Law and Information at the University of California, Berkeley.

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