Entrepreneurs, innovation and patents

Jim Farmer of immagic investigates entrepreneurs and software patenting trends

Innovation in the knowledge economy differs sharply from the industrial age. Inventions now primarily yield intellectual property. IP requires major investments and often, the result can be reproduced quickly at negligible cost. To make invention economy viable, patents, trademarks, and copyright have become the protectors of innovators and inventors.

Typically, IP entrepreneurs are well educated, accustomed to working in small teams, and were introduced to information and computer technology (ICT) at an early age; sometimes even before going to school. They are accustomed to using technology and many have the skills to improve it. They are motivated to improve technology and its use. Two well-known examples are Bill Gates and colleagues who developed the software that later led to Microsoft Corporation and Mark Zuckerberg and colleagues who developed the Facebook social-networking software and founded Facebook Inc. All were Harvard College undergraduates when their ideas were first developed as improvements to Harvard’s processes.

Software entrepreneurs such as these are growing the global economy faster than companies focused on low-tech manufacturing or services.

A 2008 University of California Patent Survey identified two areas where major innovation is occurring: biotechnology and hardware companies, and software. These two areas have sharply different characteristics. Biotechnology inventions have major upfront costs for clinical trials and regulatory approval. The companies tend to have more patents than software companies where the costs of an invention and its commercialisation are less.

The median respondent to the University of California’s survey of “startup” companies are those founded in April 2002, six years before the survey, has nine employees, and has neither had an initial public offering (IPO) nor been acquired. (Acquisition is increasingly the monetisation of the firm rather than selling shares to the public).

The Organisation for Economic Co-operation and Development (OECD) reported on patent applications for categories similar, but not identical, to the Berkeley Survey. Table 1 shows the percent of OECD’s “world patents” for biotechnology, which includes medical devices, information and computer technology, and the sum of the two labelled “High Tech.” It is clear the European Union and the United States dominate biotechnology and much of information and computer technology. 2008 is the latest patent data by technology. There is no separate category for the United Kingdom though there is for Germany.

As shown in figure 1, more venture-backed companies hold patents than the population as a whole. Venture capitalists requiring patents as a condition of funding is one of the reasons cited for this difference. As
the Berkeley Survey was interpreted, “Venture investors are interested in patents, and venture-capital backed companies are much more likely to hold and file for patents.” Entrepreneurs should be prepared to apply for patents if they expect to receive venture-capital funding.

**Table 1: High technology as percent of patents 2000**

<table>
<thead>
<tr>
<th>Biotechnology</th>
<th>ICT computer</th>
<th>“High tech”</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>3%</td>
<td>54%</td>
</tr>
<tr>
<td>EU (27 countries)</td>
<td>10%</td>
<td>54%</td>
</tr>
<tr>
<td>Israel</td>
<td>10%</td>
<td>54%</td>
</tr>
<tr>
<td>Japan</td>
<td>4%</td>
<td>41%</td>
</tr>
<tr>
<td>United States</td>
<td>8%</td>
<td>35%</td>
</tr>
<tr>
<td>World</td>
<td>5%</td>
<td>32%</td>
</tr>
</tbody>
</table>

Ross Dannenberg and Steve Chang went further: “Many in the industry feel that games are simply software, and that they cannot be patented. This is untrue. To the contrary, patents may be obtained on ‘anything under the sun that is made by man’ (Quoting Diamond v Chakrabarty, 1980) and computer programs are no exception.”

As an example, they listed US patents by number that cover video games, including Project Gotham Racing, Dance Dance Revolution, Crazy Taxi and Dynasty Warriors.

The key to a successful patent application is to follow the strategy and structure of what has been approved before. For example, a review of Nintendo patents show their patents are always related to a device, which makes them patentable in the European Union and often in the United Kingdom.

Is software patentable? Are games patentable?

Reading the law it would seem barely in the US, very limited in EU and not at all in the UK. Yet in 2006 there were 41,000 software patents in the US. In the UK the High Court of Justice Patents Court has allowed what could be considered software patents. (For example Astron Clinica Limited and others v Comptroller General or Patents and Symbian Limited v Comptroller General of Patents).

In 2005 Ross Dannenberg and Steve Chang, patent attorneys focusing on video games, responded to the assertions that inventors believe there is nothing new in “my” video game. They wrote:

“All inventions nowadays build on the work of others, and this myth is just a classic example of selling yourself short. Inventions come in all shapes and sizes, and if your game does nothing more than add one novel concept to a mountain of old game concepts, that novel concept may be patentable. An entrepreneur should constantly seek these little differences as potential patents and not assume their work is not patentable.”

Entrepreneurs of software firms reported only slight to moderate incentives to invest in new products, processes, or services, conduct initial research and development, creating internal tools or processes to build or implement products, processes or services and undertaking the risks and costs of making, selling, and marketing a commercial product.

The survey analysis suggests patents “appear to be supporting other activities crucial to technology startups: securing the necessary investment to develop and grow; increasing the odds and quality of a liquidity event, such as an acquisition or Initial Public Offering (IPO); and serving strategic roles in negotiation and defending against patent infringement suits.” These purposes are more closely related to requirements for funding of innovation and defending against patent infringement – activities that entrepreneurs would like to avoid.

Entrepreneurs have several ways to capture competitive advantage from technology. For all software startups filing patents, they ranked “first mover advantage” as most important, and then complementary assets, secrecy, copyright, trademark, difficulty of reverse engineering. Least important was patents. The ranking is quite different for biotechnology – patents ranking the most important, and medical devices where patents are second to “first mover advantage.”

The results differ for product and process innovation. Patenting follows only “first-mover advantage” for product innovators, but last by process innovators.

Those responding to the Berkeley survey selected the most important motivations for patenting as “preventing others from copying our products or services,” followed by improved chances of securing investment, improve changes and quality of liquidity (IPO or acquisition), improved negotiating position with other companies, preventing patent infringement actions against the firm, and obtaining licence revenues.

The reasons entrepreneurs of software firms cited for forgoing patent protection for “the last major technology innovation that your firm did not patent” were, most important, the cost of getting a patent, followed by cost of enforcing a patent, competitors could have invented around, believed technology was not patentable, did not want to disclose information, and no need for legal protection. Software firms were most concerned about the cost of filing (64%), cost of enforcing a patent (52%), and ease of inventing around (46%).

Stanford Law School Professor Mark A Lemley observing engineers seem uninterested in patents wrote:

“What’s going on here? The answer, I think, is quite simple: both researchers
and companies in component industries simply ignore patents. Virtually everyone does it. They do it at all stages of endeavor. From the perspective of an outsider to the patent system, this is a remarkable fact. And yet it may be what prevents the patent system from crushing innovation in component industries like IT. Ignoring patents, then, may be a “workaround” that allows the innovation system to function in the face of overbroad patent protection.5

Earlier interviews of young entrepreneurs (from Blackboard Inc v Desire2Learn) defending against patent infringement is consistent with the Berkeley findings. Typically they are focused on developing the product or service from an idea into a product or service. Patenting takes time from this activity, imposes restrictions on the exchange of information, and as shown-costs. Also they typically believe they can quickly “work around” any claim of infringement – which extends the litigation as courts review the “work around” for compliance.

Because of these considerations fewer than 4% of infringement claims go to trial. Most are settled just before trial. One defense for a very small firm is the threat of bankruptcy. Generally settlements depend upon what the firm can pay now and what royalty agreement is possible for the future. Although the Berkeley report cites the costs of funding a suite to be between US$3 million and USD$6 million per litigant through appeal, patent attorneys in the East District of Texas have cited costs closer to $10 million for a district trial; more if the decision is appealed. Few small firms can afford such an amount. If challenged, they often seek an economically feasible licence to manufacture or provide the product or service. Practical immunity from infringement claims.

NPE litigation is one the rise. Joe Mullin in Law.com’s Corporate Counsel (an American Law Magazine web series) writes: “Let’s start with what everyone knows-NPE patent litigation isn’t going away. Since 2007, more than 1,500 companies per year are hit with lawsuits brought by the more than 300 NPEs that PatentFreedom track (using its fairly conservative definition of what constitutes an NPE). NPE litigation has grown from where it accounted for between 2 to 3 percent of all patent suits a decade ago to the point that it now accounts for 17 percent. For some operating companies, NPE litigation makes up more than 90 percent of their patent litigation docket.”

These firms buy up patents, including those in bankruptcy sales of failed startups, and then begin enforcement. Small firms with few resources are vulnerable to the NPE’s threat of litigation. For this reason, NPEs are often called “patent trolls.” Outside the pharmaceutical and biotech industries, few companies consider inventing, or producing patented intellectual property, to be their primary mission. Corporate R&D has become mostly “D”: the development of products. Hardly any large corporations have “inventing” as a job category – even though it requires a different mind-set, has different goals, and must be managed differently than research and development positions.8

Myhrvold left Microsoft as chief technology officer and founded Intellectual Ventures (IV) with Edward Chang. January’s 2011 Wired Magazine UK described Myhrvold as “The intellectual venturer.” The feature article describes IV as “a hybrid of think tank, private-equity firm, venture-capital investor, research and development lab and law firm” and focuses on the public works of the firm. Avancept estimates IV controls 25,000 to 50,000 patents. “To date, IV has sued no company that enforces its patents against one or more alleged infringers in a manner considered unduly aggressive or opportunistic, often with no intention to manufacture or market the patented invention.”

In his March 2010 Harvard Business Review article, Nathan Myhrvold wrote: “I believe that invention is set to become the next software: a high-value asset that will serve as the foundation for new business models, liquid markets, and investment strategies. The surprising success Intellectual Ventures has had over the past 10 years convinces me that, like software, the business of invention would function better if it were separated from manufacturing and developed on its own by a strong capital market that funded and monetised inventions.

“A review of Nintendo patents show their patents are always related to a device, which makes them patentable in the European Union and often in the United Kingdom.” Wikipedia describes trolls saying: “[a] Patent troll is a pejorative term used for a person or company that enforces its patents against one or more alleged infringers in a manner considered unduly aggressive or opportunistic, often with no intention to manufacture or market the patented invention.”

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In his report with the provocative title “Are Universities Patent Trolls?” Professor
Lemley comments:

“The holdup or troll problem is particularly significant in component-driven industries, notably information technology (IT), where the problem is compounded by the fact that a product developer such as Intel that must aggregate thousands of different inventions into its semiconductor chip is vulnerable to hold-up by any one of the thousands of inventors. Patent owners in those component industries can capture far more than the intrinsic value of their invention, because under long-standing patent law patent owners have the right not just to sue and get paid the percentage of the value contributed by their invention but to enjoin the sale of Intel’s entire chip until it can design a new chip that avoids infringing that patent, something that might take years and require investing billions of dollars in a new fab?”

This tactic is especially effective against small firms with limited resources and the need to immediately complete an invention to obtain funding or revenue from marketing the product or service.

Universities, which account for 1% of patents on average across all fields, account for 12% of all patents in nanotechnology, and more than two-thirds of what I identify as the basic building-block patents in nanotechnology. The other area in which university patents are significant is biotechnology, where they represent about 18% of all patents. As a result, universities have met a much bigger role in patenting than they ever have before.

At the confluence of these developments is a growing frustration on the part of industry with the role of universities as patent owners. Time and again, when I talk to people in a variety of industries, their view is that universities are the new patent trolls. One firm with limited resources and the need to gain control of the patent resulting from his undergraduate laboratory experience. Reflecting the complexity of developing a patent strategy, Avancept points out, “For technology companies strategic intellectual property advice requires more than just legal, business, or technology expertise – it requires all three of them.” But success first depends upon an innovation that has potential market value.

Footnotes

8. Myhvold, Nathan. (March 2010). The Big Idea Funding Eureka!

Author

Jim Farmer is an economist with instructional media + magic inc. in Washington DC. He works on technologies increasing the productivity of university researchers and university intellectual property policies. He is a USPTO registered researcher and writes on patent trials at the Federal Circuit and District Courts.