University patents: an expensive lesson?

Patents are vital for protecting intellectual property rights but do universities exploit this right too much? Catherine White explores

“The secret of success is to know something nobody else knows,” said the shipping magnet Aristotle Onassis, which could easily be applied to university discoveries and inventions, where “the secret of success” could be in fact to patent. But is this theory true in practice? Are university patents a way to further innovation or an expensive tool that institutions should close the books on?

Just like fresher’s week, patents have become extremely important to universities over the years, especially in the US. The Association of University Technology Managers noted that 34,542 university innovations were patented during 1993-2004 and the National Science Board revealed that the number of US academic patents granted during 1998-2008 reached 37,467. In the UK, 1,098 patents were filed in 2002, up from 743 patents filed in 2001.

However, Ludmila Striukova from the department of management science and innovation at University College London noted that due to the overall high number of patent applications “patent offices are less thorough with the examination process and around 50% of patents that are challenged in court are subsequently invalidated.”

Researcher Joaquin Maria Azagra-Caro highlighted that university patents have increased because:

- Geographical distance does not pose relevant hindrances to knowledge exchanges with co-inventors from the industrial side;
- Access to industrial knowledge, practical experience and possibilities of application;
- Changes in knowledge production have increased the capacity of university researchers to produce patentable inventions as well as scientific publications; and
- Changes in societal demand and funding conditions encourage universities to engage in a higher control of research results and their direct management.

A patents value

Some universities consider a patent valuable when it can provide market advantage, others when it generates royalties; and some view patents as significant to help in the creation of start-up companies. Professor at the University of Notre Dame Richard Jensen, said that universities “usually patent only when the invention’s commercial potential is evident”.

Striukova highlighted in a study (right) the many ways in which patents can create value for universities, which she suggests spans across four broad asset bases and is indentified according to its position in terms of two issues: whether it is embedded in either individual entities or systems and structures or whether they are embedded in non-market relationships.

Azagra-Caro agreed with box 3 (non-market related patent values rooted in individual entities such as spillovers and entrepreneurship,) saying, “University ownership of patents has some advantages. Many practitioners would agree that it is a means of valorisation of public research results that reduces the likelihood of unfair exploitation by a firm. It allows for the creation of spin-offs, with an expected impact on production and employment.”

Linking to box 2 (market-related values embedded in systems and structures such as economic development.) Arundeepr S. Pradhan associate vice president for technology transfer and business development at Oregon Health & Science University argued that increased academic patenting is a positive for the economy. “Since 1980, American universities have spun off more than 5,000 companies, which have been responsible for the introduction of 1.25 products per day into the marketplace and have contributed to the creation of over 260,000 jobs. The result has been a contribution of over $40 billion dollars annually to the American economy.” Striukova added that “at a time when public funding is being cut down, patents provide universities with an opportunity to raise funds.”

Jim Farmer chairman of Instructional Media and Magic, a company which produces multimedia courseware for colleges and universities also agreed that like in box 1 (patent values that are market-related) patent worth lies in product development, “Applied and development research becomes new products and services. Economists have evidence that research, among other factors, increases gross domestic product.”

However, there are numerous problems linked to the value creation from university patents. For example, referring to box 3, Jensen said that the embryonic nature of university inventions is a serious issue. “Most are so embryonic that their commercial potential is just not obvious. A 2001 US university study indicated that the stage of development of the inventions...”
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licensed by these universities was proof of concept (with no prototype) for 48% of the licences, prototype available (but only at laboratory scale) for 29% of the licences, and ready for practical of commercial use for only 12% of the licences. Thus, the university’s technology transfer officials admit that the commercial potential is not obvious for nearly 90% of their inventions. It is tough to sell licences for such inventions.

Farmer also noted that commercialising university research has had an unforeseen backlash. “It changes the focus from basic research to applied research where the social value is less than if invested in basic research. Commercialisation focuses on short-term gain instead of much greater long-term social value that would result from applied and development research carried out by firms from university basic research. Patents have introduced the same objectives and attitudes of technology transfer offices as found in businesses. This focus on patent revenue has induced universities to act as “patent trolls”. For example, the University of Washington patented undergraduate research then sued six major electronic firms for infringement. It is not wise to sue your funders.”

Brett Commaille from venture capital company Invenfin agreed with Farmer saying, “I have encountered many entrepreneurs who will now not touch government funding as they feel it could prevent them from commercialising their project later on. The universities have already felt the effects of corporates who have cancelled their co-development projects due to the implications it has on the IP ownership. In short, I see many investors steering clear of projects involving government funding until the situation changes.”

Furthermore, challenging with box 4 (non-market values embedded in systems and structures like networking with investors and business relationships) university patenting continuously battles with transparency and privacy when it comes to publications. Striukova said, “Publications are crucial for the annual appraisal, potential promotion and evaluation of their research activities but patents require a form of secrecy which is not compatible with the free diffusion of knowledge through the means of publications.”

Opportunity knocks?

So has the rise in university patenting become an opportunists game? Stuart Macdonald from the University of Sheffield believes so, “Universities have changed; they are now businesses within an international education industry, part of the global knowledge economy. Universities see patents as a lottery in which they cannot lose money and might just win a fortune. Patenting can occasionally be a good thing but generally is a negative. Universities should remember they have another function – to research and publicise their knowledge for others to expand – not to patent for their own benefit and interest.”

Striukova agreed that universities act more like companies, “Universities are relatively new at the patenting game and most of them are rather inexperienced. Given the current climate, where universities are under a lot of pressure to attract funding, their main goal is generally to create financial value (eg, through licensing). As patenting nowadays is very often about litigation, rather than innovation, universities follow the example of companies and patent as much as they can in order to protect themselves from potential litigations.”

Jensen concurred saying that some universities have “adopted a policy of obtaining a provisional patent for every invention disclosure filed by a member of its faculty. A provisional patent is granted for just one year, during which time the patent holder usually decides whether to begin to work on the application for a patent. Although the cost of obtaining a provisional patent is less than that of a patent, I would not advise such a policy”.

Macdonald noted however that unlike businesses, research institutions seldom check whether they are infringing because “they expect their right to conduct research to cover them anyway. This demonstrates that they are amateurs when it comes to patenting and trust to luck. Universities don’t check if they are infringing because they don’t realise, they are only half-qualified and are playing a big boy’s game.”

Bayh-dole and technology transfers

1980 was a significant date for academia, not because of students partying to Blondie’s Call Me, but because it was the introduction of the US Bayh-Dole Act, which allowed universities to appropriate the property rights resulting from their research. In addition, research institutions created technology transfer offices (TTOs) which are dedicated to identifying research which has potential commercial interest and strategies for how to exploit it. The Act has therefore led to an increase in such technology transfer intermediaries and provided additional incentive for research exploitation.

It is the word ‘exploitation’ that doesn’t sit well with critics, for traditionally, research institutions are meant to make knowledge public not private. Macdonald said, “Knowledge is meant to be shared and copied so the public can use what’s in the past and build on it, but instead, universities have become so entrenched in the current patenting system thinking innovation should be privatised. As a result, people will look back on how we patent innovation and laugh.” He added that technology transfer offices are not good value for money because “they struggle to cover their own costs and, as a result, patents are used to cover that expense”.

Mike Masnick, founder of techdirt a blog studying changes in government policy, technology and legal issues, agreed with Macdonald and said that the Act, along with TTOs, have not been overly advantageous to universities. He said the act has been “an unqualified disaster” as it actually inhibits innovation, not nurtures it, because universities have made a mistake in thinking that the incentives for research is extracting the greatest profit and the core to commercialisation is licensing. This thinking has lead to institutions believing “they were going to be rich and set up ‘tech transfer’ offices to help licence this new found wealth. Reality hasn’t been kind … nearly every one of these tech transfer offices have lost money for the universities to set them up.” Masnick said that this was because offices overvalue patents, undervalue the actual execution necessary and the research that is produced from this manner normally doesn’t have much commercial potential. “Otherwise try to negotiate extreme agreements for the fleeting small number of actually valuable patents. This results in pricing the patent too high to anyone who can actually make use of the invention,” he said.

Masnick furthered that by binding technology with patents, it’s decreased incentives for sharing ideas, which is where real growth and real innovation lies, “Innovation is a continuous process of constantly tweaking. Patents limit the ability to tweak and to adapt, and effectively put a tollbooth on the ability to do those things. Any time you add a cost, you get less of the activity, and patents thus hinder innovation by increasing the cost of innovation.”

Likewise, Farmer added that the Act has “become a drag on innovation and hence counter-productive. It likely is still important for biotech, but counter-productive for information and computation technologies.” He added that TTOs need to be reformed to achieve maximum value, “I haven’t yet seen any benefits of TTOs. TTOs should take another perspective—making a professor’s work visible to others that can further develop or commercialise it whether or not it increases licence income or produces an equity position in a start-up. Research shows that firms learn of university research work through informal contacts, not through the TTO.”

Jensen disagreed saying that the act has been a positive in many respects, “The Act may not be perfect, but it is an improvement over the preceding situation, in which over 20,000 patents arising from federally funded research were unused when the Act was passed in 1980. Faculty and firms that complain today about university technology transfer
operations are, apparently, unaware that 30 years ago there was no reason to complain because the federal government would not allow exclusive licences to inventions arising from federally funded university research, and it was making no effort itself to licence these inventions."

Azagra-Caro said that university patenting can be viewed both positively, as a means of productivity, and also negatively, by locking up innovation. He concluded that, “Patenting activities are not as beneficial as many policymakers claim nor as harmful as many academics state. Society gains by having more technology-oriented universities, but loses by having less joint research with industry and less contributions to the local economy.”

Footnotes

What could be done?
Farmer believes that in order for universities to protect the collaborative environment of institutions, patents should only be encouraged in areas where needed and should never be viewed as a measure of the value of university research. Therefore, he proposed that universities should follow six patent policies:
(1) What should be patented and when from the perspective of long-term social value—consistent with the traditional role of universities in society.
(2) Specific limits on secrecy (one suggestion is to defer publication by only three months; NIH has a 12 month "must disclose" policy for NIH funded research).
(3) Procedures for informal collaboration with firms.
(4) Broader, more frequent and more specific disclosures—say the objectives of current research, interim results, and draft publications—to firms depending upon the principal researchers practices.
(5) Measure researchers using bibliometrics, as further developed, rather than patent income. (Bibliometrics, increasingly used in Europe, is not perfect, but less hazardous to university research than licence fees).
(6) The use of public domain and defensive patents as a public good when needed to protect the public interest.

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