Building and managing university patent portfolios
Intellectual property (IP) management is of strategic importance for universities since they can derive significant benefits from an effectively managed IP portfolio. According to a survey published by the Association of University Technology Managers (AUTM), the fiscal year 2002 saw over US$37 billion in sponsored research expenditures at 212 member institutions responding to the survey. During the same period, over 3,600 US patents were issued bringing in US$1.267 billion in licensing revenue and 450 new companies were formed to develop and commercialise some of these inventions.

However, given resource constraints in evaluating and licensing new technologies, university technology transfer offices (TTOs) must adopt strategic plans to avoid missed opportunities in promising and potentially important technologies while managing IP risk. This task is complicated by the inherent market and technical uncertainties typically associated with university innovations.

**Adopt an aggressive approach**

The great potential for universities to generate revenue from IP is less likely to be realised if universities adopt a passive stance towards exploitation. Instead, there is a need to identify exploitable IP, decide how it can best be protected, evaluate its commercial potential, identify routes to commercial development, and secure and negotiate with appropriate development partners.

How aggressive should TTOs be in selecting a portfolio of technologies to pursue? Most venture capitalists (VCs) and for-profit licensing entities are relatively conservative in pursuing technologies. VCs choose technologies that they build into start-up companies, and hope these start-ups will go public. However, only a comparatively small number of technologies will meet the level of technological and business potential required. While TTOs need not be as selective as VCs – and they cannot be due to the early stage of their inventions – they must be prudent. Pursuing too many technologies can be costly and can divert attention away from important technologies.

One of the first tasks in implementing this strategy is to gain top-level university support for greater risk taking and to adopt an aggressive stance toward technology licensing. Other steps may include promoting a willingness to commit to commercialisable technologies, including bearing the risks and upfront costs, even when a prospective licensee remains unidentified.
Next, the TTO must build a search strategy. This includes focusing on the highest value-added technologies and categorising technologies by size, stage and potential licensing paths. By trimming their portfolios, licensing officers are freed up to spend more time, effort and care with each technology to which they commit. Internally, you need to have a licensing specialist who is responsible for identifying, developing properly, protecting, maintaining and ultimately leveraging the intellectual property.

**Develop seed funds**

The next level of adopting an aggressive approach is to ripen technologies which are too embryonic for private markets. TTOs might actively seek mechanisms, including sponsored research and private development firms, to perform the applied research necessary to bridge the gap for high potential, embryonic technologies.

Universities may also decide to contribute to seed funds themselves. University seed funds can play a role in increasing the share of the financial rewards. This type of investment can reduce investment risk by moving the technology through various proof-of-principle and proof-of-concept stages, producing a more favourable negotiating position for the university. The aim is to increase returns by funding further investment in order to reduce the investment risk faced by the spin-out.

In addition, moving an early-stage development through some proof-of-concept stages can help provide additional information which can result in a stronger patent application, in light of University of Rochester v G D Searle & Co, 358 F 3d 916 (Fed Cir 2004) (Rochester). In Rochester, the Federal Circuit Court of Appeals held that the university’s patent was invalid for failing to provide a proper written description and an enabling disclosure. The decision appears to have hinged on the fact that the University found the target for a drug treatment but not any drug itself. Further study to elucidate one or more working compounds might have provided for a different outcome.

**Encourage faculty start-ups**

An additional approach is actively to encourage faculty start-ups. Since development of a faculty start-up company can be viewed as a diversion from their primary mission, universities need to work at creating a culture where such risk taking is valued and supported. While spin-out companies typically require higher levels of commitment from inventors, at least in the early stages, the spin-out can take research outputs closer to market, thereby reducing the risk attached to its exploitation.

Since many faculty researchers are new to the creation of start-up companies, guidelines are necessary to assist faculty members who are considering starting a new business. Generally, there are three basic criteria necessary to grant a licence to a start-up company: (i) a capitalisation plan (access to seed and early-stage funding); (ii) seasoned entrepreneurial management; and (iii) a business plan containing product development and commercial milestones.

It is best to conduct any negotiations with a third-party representative for the start-up, preferably a CEO or other interim manager who can represent the company’s interests. This ensures proper alignment of the interests of the university, faculty inventors and the start-up. Ideally, the TTO takes a founding role in start-ups generated from university intellectual property. As a founder, the TTO can facilitate the acquisition of core building blocks needed to increase the odds that a new company will be successful.

Greater care to avoid conflicts of interest is necessary when researchers hold equity in spin-outs. Should the company encounter commercial difficulties, the faculty staff may be under more pressure to divert from academic to company duties, especially if they are also directors with legal responsibilities for the company.

**Manage IP costs**

The legal aspects of managing IP assets are often viewed by businesses as burdens to their broader business operations. This view is often because the benefits of enacting and maintaining legal safeguards are not immediately obvious, nor are there clear numerical valuations for such activities. However, substantial value is obtainable through proper management of IP assets. For example, the cost of drafting and negotiating a clear licensing contract with a third party may be nominal when compared with the potential risk of litigation in the future. The cost of drafting and prosecuting a strong and broad patent application that issues as a patent and acts as a market barrier to competitor companies could be a small percentage of the profits that may be reaped while market leadership is maintained.

Accordingly, a straightforward cost-benefit analysis can be utilised to develop an IP management budget. The university’s IP management plan should include an explicit review process for all inventions, under which technical and business managers, along with outside patent counsel, periodically evaluate each invention to determine if patent protection is cost effective.

The current and future markets of a technology can be international in character. In such cases, it is important first to
investigate the costs and benefits of obtaining international protection for IP assets. The costs must be balanced against projected potential market success of products and services in various foreign countries. While there has been recent harmonisation of international intellectual property laws under international treaties, not all member countries are on equal footing. When considering which countries to obtain IP protection in, the broader cultural, economic and political underpinnings of each country must be taken into full account.

To make the most out of IP assets, it is a good idea to get input from a team of business, legal and technical experts, both inside and outside the corporate organisation. In-house personnel should work with the outside counsel, if applicable, to establish and update the IP management plan on a periodic basis, to define the circumstances when to act on or protect an IP asset and when to abandon an IP case, and to monitor new developments to avoid conflicts with prior IP rights.

The cost of management neglect is not just foregone revenue, it is also money subtracted from the bottom line – patents are not free. Sometimes it is necessary to prosecute the patent to issuance, adding a substantial amount to the basic cost of US$15,000 to US$20,000 to file a patent application. Universities should aggressively cut loose patents that are no longer valuable. A single patent held worldwide for the course of its 20-year lifetime (from filing date) will cost an estimated US$50,000 to US$100,000 to obtain and US$250,000 to US$500,000 to maintain. Therefore, define criteria regarding when to get rid of dead weight.

In arrangements where outside counsel are employed to handle IP rights, thoroughly explain budgetary constraints and ask for the range of options available, including their long-term and short-term costs. It is important to understand the potential lifetime costs of any action, not just its immediate cost to file.

**Manage IP donations**

Recently, more companies are looking to abandon or donate their patents to non-profit entities. Corporations find that donations reduce the costs of maintaining patents, rid liabilities and engender goodwill with the recipient entities. Increasingly, consulting and accounting firms are promoting services and systems to conduct this new intangible asset management.

Generally, patent donors can take a tax deduction for the fair market value of the asset. Note that the practice has drawn the attention of the Internal Revenue Service with proposed legislation looking to limit the value of these deductions, so there is a certain level of tax risk involved. Thus, managers should produce a strong valuation report, as well as justification that the recipient university is a qualified willing buyer.

Universities must keep in mind that continued expenditure of time and money is required with patents. Costs begin at the initiation of R&D efforts and are incurred to establish the invention, and to apply for and prosecute patents. Once granted, patents require maintenance fees be paid to all jurisdictions in which the patent will be held in force. Should anyone seek to enforce a patent, additional costs are necessary to take corporate or legal action.

Therefore, it is recommended that IP donations include, if possible, the financial resources necessary to maintain the patent(s) for a period of at least two years following the donation as well as financial support for further research and development of the donated IP. The university must evaluate the relevance and fit with an ongoing research programme within the university and the willingness of researchers to carry out further research involving the donated IP. All donated IP should be valued initially at US$1.00 and, if and when the donated IP is commercialised, its value can then be determined by the most appropriate means available.

**Watch your own IP use**

Universities have very limited latitude to use others’ IP freely; therefore, they need to be on guard against the possibility of infringement. The recent case *Madey v Duke University*, 307 R 3d 1351 (Fed Cir 2002), has set off a debate about research at federally funded universities and their right to conduct research without the worry of infringing the IP rights of others. The Federal Circuit Court of Appeals has held that the experimental use exception will not shield universities.

The case arose out of two patents owned by Madey, obtained before his appointment at Duke. After his termination, he sued Duke for infringement of his patents. Duke claimed the work it was doing was the subject of government licences and that it was protected by the experimental use exception. The district court held that use of the patents to fulfil government contracts was not patent infringement. On the experimental use issue, the district court placed the burden on Madey to show that the University’s use did not meet the experimental use exception.

The Federal Circuit reversed on both issues. However, the experimental use issue is what concerns universities. Duke argued that as a non-profit educational establishment its activities did not constitute patent infringement as long as they were solely for research, academic or experimental purposes. The Federal Circuit disagreed and pointed out that in *Roche*...
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Products, Inc v Bolar Pharmaceutical Co, 733 F 2d 858 (CA Fed.), cert denied, 469 US 856 (1984) and other cases, it had held that although an experimental use exception continued to exist, it was a very narrow one, for example, “to satisfy idle curiosity or for strictly philosophical enquiry”. The court went on to state that “regardless of whether a particular institution or entity is engaged in an endeavor for commercial gain, so long as the act is in furtherance of the alleged infringer’s legitimate business and is not solely for amusement, to satisfy idle curiosity, or for strictly philosophical inquiry, the act does not qualify for the very narrow and strictly limited experimental use defense”.

Left unanswered in the Madey case is how damages can be measured when a one-time infringing use of a research tool is made on the way to developing a valuable non-infringing end product. Complicating matters is the defence of sovereign immunity for sponsored research at a state institution. One recent case, Syrrx Inc v Oculus Pharms Inc, 64 USPQ2d 1222 (D Del 2002), held that the corporate sponsor may be liable for infringement under a theory of active inducement.

Considerations of a similar nature arise in relation to copyright and the use of published materials for teaching purposes (eg, distance learning). Part of the IP management function is to ensure that there is clarity among researchers as to the legal position and to guard against any such infringements.

Evaluate performance
Finally, universities must continually evaluate the process. Performance indicators, such as net revenue and the number of agreements signed, can fulfil two main purposes. First, they can be used to demonstrate to external organisations that the university is capable of managing IP effectively. Second, performance indicators are obviously helpful in assisting university managers to identify problems and opportunities relating to IP management and to modify budgets and strategies accordingly.

The long time lags between costs being incurred and revenues being received mean that evaluations of financial performance should be patient and recognise that costs and revenues are separate, in the sense that changes in revenues may have little to do with changes in costs. There is usually little direct control over the relationship between IP management costs and revenues. Effective IP management is consequently concerned with seeking to maximise the likelihood that unexpected high returns might happen, and not with setting targets for financial returns and judging performance against these targets.

Income generation is not the only reason why IP needs to be managed effectively, and factors as diverse as protecting the university’s research capabilities and contributing to economic development are also important. Therefore, subjective factors, such as high-profile agreements and faculty satisfaction, must be included in any evaluative process.

Every stakeholder, from the licensing specialists of the TTO to the scientists in the technology labs to top management must aggressively participate in IP management. Organisations that devote the appropriate resources to cultivate and manage their IP assets will be positioned to reap the greatest benefits.
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