

UNSW's Technology Transfer Approach

Never Stand Still

NewSouth Innovations

This document summarises the UNSW Australia approach to Technology Transfer, with particular emphasis on the role of Easy Access IP (EAIP) as a means of improving the flow of research outputs into use in industry, the economy and society.

Easy Access IP

- A new approach, using IP as a basis for collaboration rather than a source of revenue
- Simplified approach, removing barriers to university/industry partnerships
- Royalty-free, exclusive licence to quality IP
- 1 page agreement
- 63% success rate for licensing EAIP technologies
- Increased researcher engagement
- Demonstrated partnership-building with industry
- Enabling the creation of new companies and jobs
- Adopted by leading universities in Australia, UK, Europe and Canada

We start with an apparently simple, but very challenging question:

What is the Purpose of Technology Transfer in the University Setting?

There is an ongoing debate within the technology transfer/knowledge exchange community regarding the purpose of technology transfer in the University setting.

Is the goal to:

- Make money from inventions discovered through the course of research?
- Provide a service to academics assisting with research partnerships?
- Develop the economy through the creation of jobs and new businesses?

Moving back to first principles, we believe that **none** of the above is correct.

“We believe that technology transfer is a mechanism for getting new knowledge put to use in industry, society and the economy.”

– Kevin Cullen, CEO NewSouth Innovations, UNSW

Universities exist to **create and disseminate knowledge**.

Universities create new knowledge through conducting high impact world class research.

Universities disseminate this knowledge through three core activities:

- Publication – to communicate new knowledge to academic peers.
- Teaching – to communicate new knowledge to the next generation (students).
- Technology transfer – to communicate new knowledge to industry and society.

This view of technology transfer ensures that the mission of the technology transfer office (TTO) automatically aligns with the university’s mission and helps to direct the activities and objectives of the TTO. This is important given that the expectations of stakeholders such as researchers, university administration, public research funding entities and government all fundamentally differ. Clarity of mission for the TTO is critical.

The Relationship between Research and Impact

Globally there is an increasing focus on demonstrating or measuring the societal benefits from research and a need to better coordinate the reporting and promoting of impact of these research outcomes. This trend is evident in Australia through the Research Impact Assessment (RIA) and the Excellence in Research for Australia (ERA), and in the United Kingdom through the Research Excellence Framework (REF). In the USA, publicly funded bodies such as the National Institutes of Health (NIH) and the National Aeronautics and Space Administration (NASA) are placing more emphasis on societal and economic impact as a

return on research investment than at any time in the past. This global movement towards impact driven research funding makes sense on the surface, but assumes a linear relationship between research funding spend and demonstrated societal impact.

In reality, an ecosystem exists with non-linear relationships between knowledge creation and impact. To obtain impact, research outputs must flow through knowledge exchange channels into the hands of the end users (Figure 1). Technology transfer offices have a vital and important role to play in helping to maximise these knowledge flows. Optimising the channels and making sure that knowledge flows to research users is the most effective way of driving research towards commercialisation and impact as efficiently as possible.

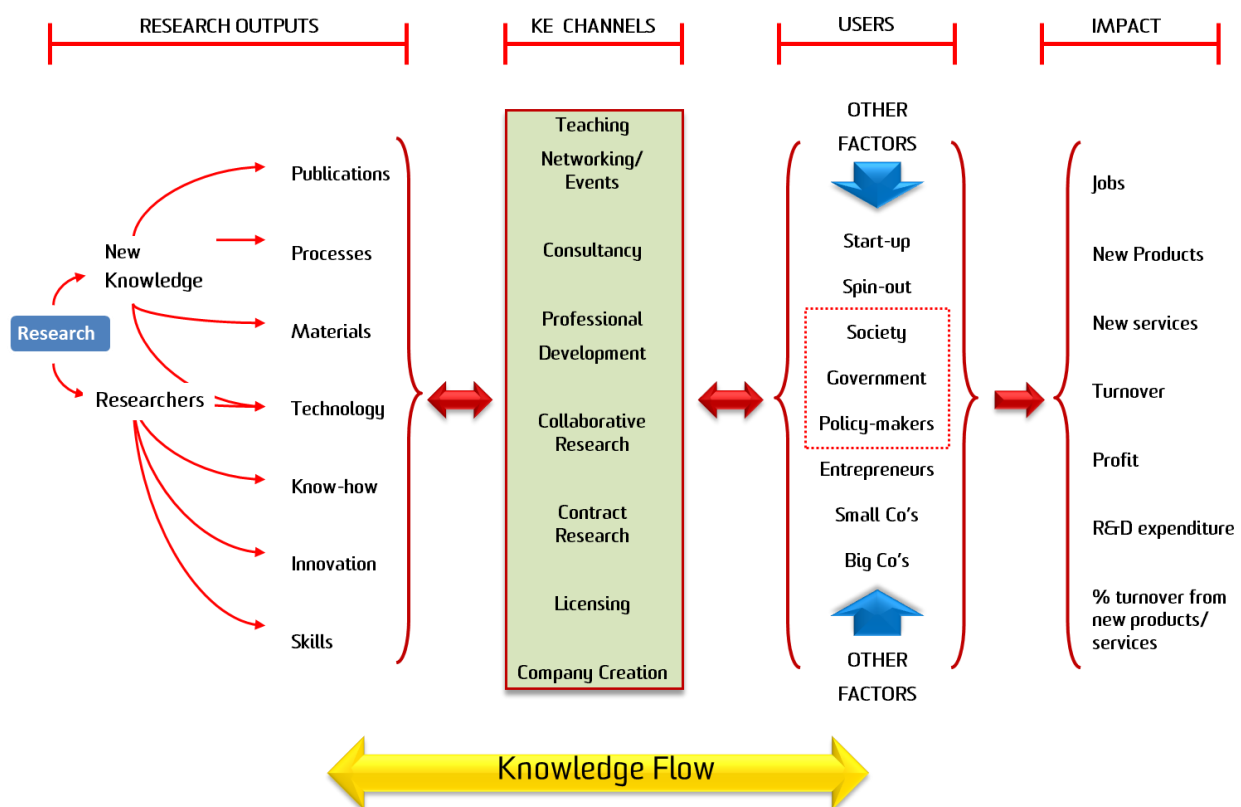


Figure 1. The Knowledge Exchange Ecosystem

Easy Access IP – an Innovative Approach

Traditional Technology Transfer Models

The traditional technology transfer model, as practiced by most universities worldwide, is inefficient and expensive. There is a tendency to assume that all IP is valuable unless proven otherwise, leading to widespread criticism that TTOs have unreasonable expectations around what industry should pay to access the IP.

In any given year a typical TTO is actively marketing and developing between 50 and 200 unique technologies across a wide range of sectors. Given the limited resources within TTOs, it is unreasonable to expect them to protect and develop all of these into products, especially considering that most university IP is early stage. Most large multinationals would be pushed to develop this many new products in so many markets year on year.

The metrics collected by the Association of University Technology Managers (AUTM) show that, on average, 95% of licensing income arises from only 5% of IP disclosed to the technology transfer office. The reality is that a proportion of IP (~5%) is at an advanced stage of development and is relatively easy to partner to an end user. The remaining 95% of IP is generally at an earlier stage of development and requires significant development before becoming commercially attractive. As described above, TTOs typically have neither the time nor the budget necessary to develop this 95%. Any attempt to do so usually causes inefficiencies and reputational problems.

Technology transfer offices are often criticised for:

- Over stating the value of technology.
- Being difficult to negotiate with.
- Achieving poor rates of commercialisation.

The most concerning aspect of this traditional technology transfer model is that it can act as an obstacle to knowledge flow from the university into the economy and that knowledge exchange is not happening optimally. If this is the case, then TTOs are failing in helping to deliver the university mission.

The UNSW technology transfer approach acknowledges that all university developed IP has inherent value, but only a small proportion has significant commercial value to the university. For the small proportion of IP with significant commercial value, we still attempt to exploit through traditional technology transfer mechanisms. All other IP is transferred to potential partners for free as long as they can demonstrate how they will use it to benefit the community, society or the economy – this is **Easy Access IP**.

Why Easy Access IP?

License negotiations on IP are often confrontational. As the research is often at an early stage of development, the potential value is often unclear and the required product development costs to unlock any value are equally unclear. The relationship between the university and the potential licensee can start on a negative footing, and the transaction often grinds to a halt.

As Easy Access IP is 100% transparent, this confrontational situation is avoided and the relationship starts on a positive footing. The licensee usually wants to not only access the knowledge of the researcher but to also sustain and grow the relationship with the researcher and the university in order to derive maximum value from the IP. Hence the license becomes the starting point in the relationship, which often leads to consultancy, research collaborations and other researcher engagements. If executed well, Easy Access IP creates a virtuous cycle (Figure 2). Value is transferred to a partner via an Easy Access IP license; value returns to

the university in the form of research collaboration and funding. The cycle completes with further knowledge creation and exchange to the partner ultimately growing the relationship.

The Easy Access IP model is more effective than the traditional model as it delivers research partnership opportunities back to the university. Research partnerships are more closely aligned with the university mission as opposed to licensing income, which for 95% of technologies is never realised anyway.

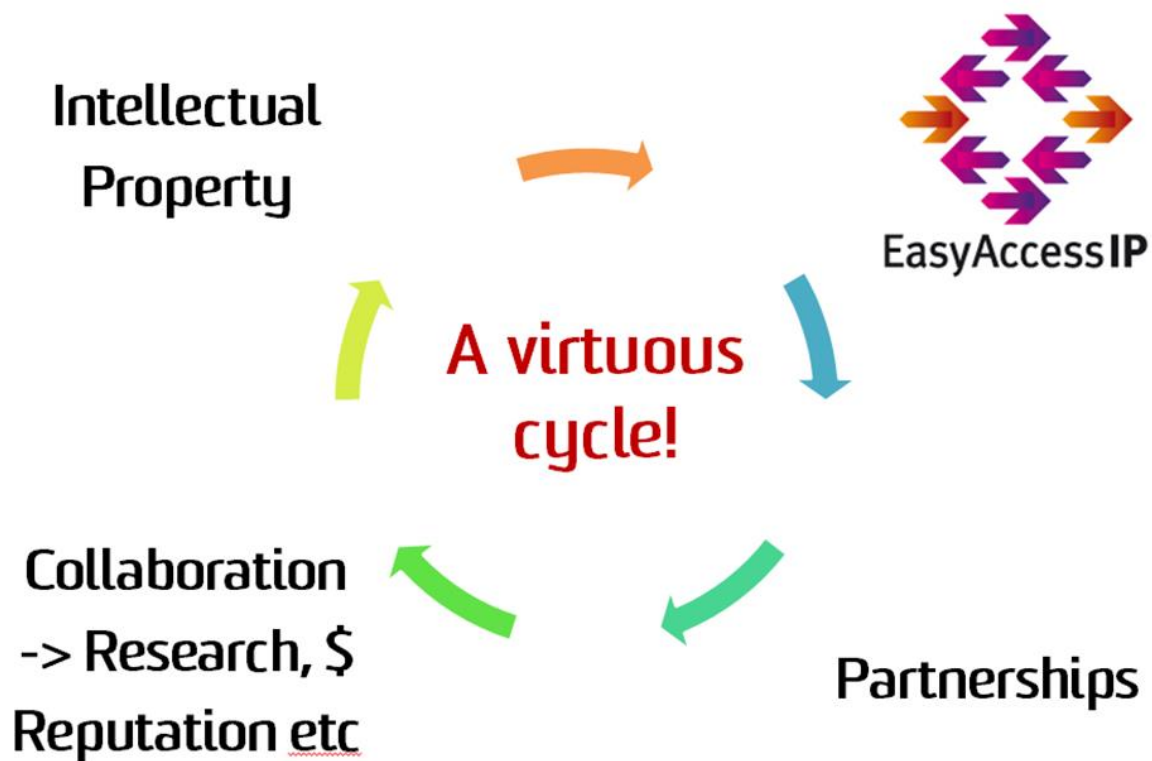


Figure 2: Easy Access IP creates a virtuous cycle

Easy Access IP is also about challenging the demand side. We want to work with companies who can commercially exploit our IP to create social or economic impact.

Most countries express concern regarding the level of interest from industry in working with academia and the relatively low level of investment in R&D and innovation by companies. We see Easy Access IP as a pathway to increase this level of interest and remove the perceived barriers that industry has to overcome in order to form research partnerships with universities.

Easy Access IP is Transparent

To keep Easy Access IP 'easy' we operate under complete transparency using simplified template agreements. These template agreements are non-negotiable, but completely reasonable given the financial consideration requested from the licensee. The license is a 1-page agreement comprised of four key terms.

The terms we apply are:

1. The licensee must tell us how they are going to use the IP and what benefits that they will deliver.
2. The university retains academic use right for research and teaching.
3. A three year reporting period to ensure that the licensee is exploiting the IP. We are happy to assign ownership of the IP after this three year reporting period as long as the licensee can show that they are actively using or developing it.
4. The licensee must acknowledge the university's contribution within any commercial offering derived from the IP.

Once licensed, the licensee takes on responsibility for IP protection and is required to provide an annual update on progress. This ongoing reporting has proven useful as a means of helping to sustain the conversation between the researcher and the company.

An International Movement

Easy Access IP has been adopted by a number of institutions around the globe. Currently there are 20 participating institutions representing Australia, Canada, Denmark, Sweden, Switzerland, and the United Kingdom (Figure 3).



Figure 3: Universities who have adopted Easy Access IP

Does Easy Access IP Work?

The implementation of Easy Access IP at UNSW has been an overwhelming success. Since launching in November 2011, 26 technologies have been partnered in 18 separate licence agreements granted to small & medium enterprises, start-up companies and entrepreneurs. Easy Access IP licences have resulted in new research collaborations with UNSW that have led to follow-on projects funded through contract research and government leveraged funding (Australian Research Council Linkage grants).

We have issued 4 options to Easy Access IP licences within research agreements as an evolution of the Easy Access IP model to IP under development. These options have been given to large multinationals as well as smaller local entities.

Of the technologies we have made available under Easy Access IP, **63% have been licensed**. This is an excellent result and clearly demonstrates that the model works compared to the 25% technology licensing rate commonly observed with traditional technology transfer models.

The perceived value of NewSouth Innovations, the TTO at UNSW, has increased within the academic community. One of the positive observations noted is an increased number of new researcher engagements and an increased quality of IP disclosures. Researchers report that the new approach helps them to achieve their objectives of finding people interested in their work and new research partners. The old model, we have been told, tended to stop them from publishing, speaking about their work and also gave them lots of paperwork to do – none of which are attractive to researchers.

We have also observed an increase in the percentage of new patent registrations vs. number of disclosures received. This is a solid indicator of the support of the academic community and an increase in the quality of the IP that is being disclosed.

The benefit and societal impact to the economy is clear. Easy Access IP licenses have resulted in six new companies being enabled, which have led to job creation and economic development.

The licensing and commercial income arising from the 5-10% of IP which we deem high value has actually increased since we have adopted Easy Access IP, with commercialisation efforts focused on a small number of high potential projects.

Indirect Benefits

There have been many indirect benefits to UNSW as a result of Easy Access IP. These benefits include:

- Increased public profile of UNSW through articles in both local and national press about the initiative.
- These articles have been published in most of the mainstream newspapers including the Sydney Morning Herald, The Australian, and the Australian Financial Review.
- Differentiation and elevation of UNSW from other universities, with the message that UNSW is an easy place to do business.

- An increased number of external engagements and enquiries that result in new research collaborations and potentially high value deals moving forward.
- By focusing and prioritising our efforts, we have a more compelling proposition for our partners. The business and entrepreneurial community supports our initiative and are helping to drive us to success.

Other Notable Developments

The success of Easy Access IP at UNSW has led to the model being adopted by other Australian institutions such as the University of Wollongong, Macquarie University and the University of Technology Sydney with several other institutions seriously considering adoption.

This has created a local hub of Easy Access IP Universities which has enabled synergies and cross marketing opportunities. These developments have been noticed by state and federal governments. Notably, the New South Wales Government Department of Trade and Investment supported an Easy Access IP pilot as one of their 2013 strategic priorities. The pilot measured the outcomes of making research outputs available to industry as no-cost licenses.

Easy Access IP Case Studies

Novel actions of Albendazole and anti-cancer properties of Monepantel

A series of 5 technology disclosures which cover off label applications for albendazole, an established anti-worming drug developed by GlaxoSmithKline was licenced to the inventor Prof. David Morris who is a conjoint UNSW employee through SESIAHS and the Faculty of Medicine.

At Prof. Morris's request, NSi recently novated the Easy Access IP license to Pitney Pharmaceuticals, an IP holding company in which Prof. Morris has an interest.

Monepantel, a veterinary treatment for gastro-intestinal roundworms in sheep (currently marketed by Novartis as Zolvix) has been shown to have utility in the treatment of cancer.

Pitney Pharmaceuticals was recently acquired by PharmAust (ASX: PAA) who have begun to test Albendazole and Monepantel as potential therapeutics for the treatment of canine cancer.

Characterising the uncertainty in potential large rapid changes in wind power generation

The software which measures/predicts power generation and efficiency of wind turbines was licensed to Roam Consulting Pty Ltd, a provider of expert products and services in energy market systems. The software was developed by Nick Cutler who was a PhD student and then post doctoral Researcher at UNSW.

Since this license was executed the press surrounding the IP has generated significant local and overseas interest. Notably, this interest appears likely to convert to research collaborations not directly linked to this technology.

Playconomics

Playconomics, a computer game which simulates trading and micro-economic models in a virtual environment was licenced to Alberto Motta who intends to continue development of the game for use in teaching undergraduate economics courses.

The game has been further developed which has led to widespread adoption for teaching microeconomics undergraduate coursework. The work on Playconomics has also led to the inventors being awarded the prestigious 2013 UNSW Vice Chancellors Award for teaching excellence in the category of Learning and Teaching technologies. They were also awarded the Heinz Harant Award for Teaching Innovation.

Ex Vivo Organ Transplant Support (BeatBox)

The BeatBox is an 'ice chest-like' device that has the ability to keep organs viable for extended periods of time. The concept was licenced back to the inventors who intend to further refine the prototype designs before seeking venture funding to reduce the designs to practice.

Simple and rapid determination of solvent dryness (Water Trace)

Water Trace, a simple electrochemical method of determining solvent dryness was licensed to Polymorph Group Ltd, an innovation and product development company based in Calgary, Alberta, Canada. The technology was developed by Dr Chuan Zhao who is a Senior Lecturer from the School of Chemistry at UNSW.

Polymorph group have a detailed plan to undertake significant market and end user analysis before undertaking a product development initiative to produce portable and inline sensors for the analytical and oil and gas markets.

Using short range communication from smartphones to personalise and automate device configuration

The technology is a method of communication and configuring computer settings remotely via a smartphone handset developed by Dr Tim Moors from the School of Electrical Engineering and Communications. The IP has been licensed to Invigornet Pty Ltd, a company that specialises in developing applications for the Android and iOS operating systems.

Invigornet intends to use this methodology to prepare a smartphone application that acts as a 'password manager' and exploits this IP to allow a user to automatically log into websites without having to enter username or password data.

Method to generate and maintain WiFi fingerprinting database automatically, and indoor navigation systems including smartphone apps

GPS location services are only effective when operating outdoors. When indoors, other location systems such as WiFi positioning are required to determine location. One of the problems with WiFi location systems is the surveying and maintenance of the location databases. The licensed technology solves the surveying problem and allows automated surveying and maintenance of location information.

The licensee Ramsey-Stewart Industrial Design has further developed a navigation system which affords social equity to the blind and visually impaired. The navigation system will use smartphones in conjunction with WiFi and GPS location systems to provide detailed directions in various environments. The licensee has an ongoing research relationship with UNSW and is an Australian Research Council Linkage grant partner. A spinout company SIMO has recently been accepted onto 'The Crunch' accelerator program administered by Social Traders.

Automated Photogrammetry Roof Monitoring System

Currently there is no technology available which reliably geolocates and compares images in subterranean mines to compare movement in tunnel roofs. This system was developed by an undergraduate student at UNSW.

This technology is the first case where we had two parties interested in taking a license at the same time. Both parties were provided with the same statement of intent guidelines.

The license was ultimately granted to Stesko, a lean startup company founded by a UNSW Alumni. Its statement of intent focussed on the relationship with UNSW and its intention to make use of UNSW resources to develop a solution from the IP. Benefit to the economy was demonstrated by job creation via employment of the student inventor and a clear strategy for funding the venture. The founder Jerry Stesel has an excellent track record with one successful startup and several years' investment banking experience with a mining industry focus.

Influencing the inner ear to induce sensations of motion

The motion sensation helmet is a conceptual helmet which uses magnets to influence the inner ear to provide sensations of movement or weightlessness. The licensee, Stephen Irving is a participant in the UNSW start-up games student enterprise initiative who is going to raise funds for prototype development.

Disease universe: Visualisation of population-wide disease-wide associations

Disease universe is a novel way of visualising population wide, disease wide associations. The technology is very early stage and requires several development actions to be taken to advance the project to a point of commercial viability.

The licensee plans to apply for leveraged research funding and explore commercial opportunities with health insurers and pharmaceutical companies.

Mass Self Screening of vision in the cinema

Macular degeneration is an indication which normally affects older adults and results in a loss of vision in the centre of the field of vision due to damaging of the retina. The technology is a mass screen visualisation which allows public self-testing for macular degeneration.

The licensee Atamo, are a product design and engineering company who plan to design and develop a product using the technology to the needs of a distribution partner with access to a significant share of the eye care market.

Object Recognition System

Current object recognition implementations are computationally expensive and require significant processing power. This leads to clunky and sub-optimal performance which is often below the requirements for most real time applications. The UNSW object recognition system uses processes similar to those found in the human brain that allow fast processing of object information on low powered devices.

The licensee, AdBidx tracks and measures objects and people, gathering data, which is presented in a simple, easy to use online system. This system is used to better serve the public with advertising, visual environment, public service, facilities and other benefits. By understanding what and who moves, how and where, in an environment AdBidx delivers; increased ROI on advertising, better public enjoyment of space, opportunity for art, plus much more. AdBidx plans to develop a commercial prototype of the object recognition system and use this to support their existing advertising business activities. They have recently been awarded a NSW Techvoucher to fund a research collaboration with UNSW.

Access, Plan, track, and Tips; Smartphone Application: APTT for Cannabis Users

A mobile app that provides feedback to cannabis users about their cannabis use. It offers evidence-based information and strategies to reduce their use and helps address barriers to reduction or total abstinence.

As this app will be offered free of charge to users, the EAIP model was suitable. This will provide the inventors with protection of their idea, acknowledgement of the research group at the National Drug and Alcohol Research Centre at UNSW and could lead to potential new funding and partnership opportunities for the Centre.

Zedelef Pty Ltd

Zedelef was founded by three UNSW researchers from the school of Electrical Engineering with the primary aim to commercialise liquid crystal based sensor technology. At its core, the technology allows the conversion of an electrical input into an optical output. These technologies enable the development of sensors for a variety of important applications including ocean surveillance (distributed hydrophones) and monitoring of gas and oil distribution (flowmeters and corrosion measurements), amongst many others. NewSouth Innovations is working with Zedelef to realise these commercial outcomes by licencing these technologies under the Easy Access IP framework.

Hazewatch

Hazewatch is a mobile pollution monitoring and personal exposure estimation system developed by A/Prof Vijay Sivaramen. The technology was recently licensed to Advanced Simplicity, a local SME who will use the system to monitor pollution levels in the Niger Delta.

Testimonials

"We acquired rights to a technology developed at the Uni by the Easy Access IP process... I fully recognize the contribution of NSi and the University to my success as a start-up entrepreneur and I am more than happy to return the favour once the research and technologies are turned into a valuable products - and this is what creates value for everyone."

Dusan Kuzma, Founder
Polymorph Group, Inc.
Canada

"The Easy Access IP initiative has made working with UNSW more transparent, straightforward and uncomplicated... There are plenty of great ideas in this country and UNSW is providing one pathway to help tap into this IP resource."

Euan Ramsey-Stewart
RSID Pty Ltd
Sydney, Australia

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