Case Study

Knowledge Commercialisation Australasia: Is there a route to professionalisation?

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Background

Knowledge Commercialisation Australasia (KCA) is the peak body leading best practice in industry engagement, commercialisation and entrepreneurship for research organisations. KCA represents the commercialisation arms and offices of Australian research organisations, which operate as the main interface between research organisations and the external entities which they engage on commercial matters.

General Characteristics of the Knowledge Transfer Sector in Australia

Australia has 37 active research universities, a number of public research organisations (e.g. CSIRO, Data61, DST Group, and ANSTO), 33 active co-operative research centres, a number of medical research institutes (MRI), and Rural R&D Corporations (RDCs). There are also more than 200 active spinouts/startups from these institutions that have R&D as a primary activity. Most research organisations in Australia have established dedicated units or companies wholly owned by the organisation to facilitate technology transfers and commercialisation. These entities take a variety of forms and have differing responsibilities.

The customer

Technology Transfer practitioners within Australia serve two heterogeneous client groups: their "internal" customer and their "external" customer. Internal customers are their primary client and are the research organisation which employs them to represent their best interests around commercialising its intellectual property. These customers have very varied levels of skill, understanding and experience with the sale of their intellectual property assets. External customers are those who research organisation engage with to purchase the research organisation's intellectual property assets, and also have very varied levels of skill, understanding and experience in purchasing intellectual property assets from publicly funded research organisations (PFROs).

The risks in serving the customer

When undertaking a transaction where both the internal and external client have the necessary skills, experience and understanding of the process and what they are required to do, transactions are relatively straight forward. However, when there is a disparity of knowledge, skills and experience on either side, challenges can arise, and the ability for the situation to be unfairly manipulated to the detriment of either or both parties heightens. It is in these situations more than in others where Technology Transfer practitioners need to behave ethically and deliver a professional level of service to both internal and external clients to ensure both are protected from professional or economic harm. For the internal research community there is the risk of being prohibited to conduct research, their lifeblood, and for the external business community, there is the risk of suffering economic loss.

Such risks, particularly around economic loss to the business partner, are an inherent part of early stage commercialisation transactions, and therefore cannot always being prevented. While it is the individual that makes all decisions pertaining to a deal, typically speaking, within member offices it is the organisation which maintains liability and responsibility for deals and transactions between the PFRO and the business. Although the individual has more impact on the end result of a negotiation than the overarching liable entity, individuals are not generally held responsible if a deal goes bad.

Too many factors are outside the control of the individual and so long as the individual provides both their internal and external client with all the appropriate information and have not misrepresented themselves or any advice or materials in any way, then they are not held personally responsible for a deal gone awry. Where there might be personal ramifications is if the individual deliberately misleads or withholds information in order to get a contract signed.

KCA is of the strong opinion that it is imperative for the Technology Transfer practitioner to ensure they do not misrepresent themselves or the opportunity to the external client, and that they have the best interests of their internal client in mind when negotiating and communicating the terms of the agreement. Deliberate misrepresentation is detrimental not only to the specific transaction in which it occurred, but to the sector as a whole. In this industry, our organisations and their reputations have a tendency to be amassed into one; it is in the best interest of all if individuals conduct themselves in an ethical and professional manner. As the peak body for these individuals, it is up to KCA to help manage the perceived image of the sector, and ensure that individuals do not act in a way which is to the disservice of others.

Managing the risks

Some of this is self-managed by the sector as a whole. It is a small industry and as a result, personal reputations invariably suffer when a job is not well executed. That said, as an association KCA would like to ensure the right hires are made in the first place to ensure that this risk is minimised and that all individuals representing publicly funded research organisations are working towards the better good and operating in a matter that is in the best interest of everyone.

Professional and ethical obligations of practitioners

It is the professional responsibility of Technology Transfer practitioners to enable the output of publicly funded research to be put to use in a manner that will result in societal or economic benefit. To do this effectively, they require certain skills, knowledge and understandings (much of which can be taught), in addition to certain personal characteristics which should be inherent.

Further to this, they must do this is an ethical manner, which simplistically put, means doing the right thing by all involved. Doing the right thing by their researchers to ensure their results are broadly taken up, while not hampering their ability to do their research. Doing the right thing by the institution that they speak for and representing that organisation in a manner which is conducive to its overall brand. Doing the right thing by companies and not misrepresenting the nature of any opportunities.

The need to define a practice

The practice of transferring intellectual property from publicly funded research organisations is relatively new. It is a practice which has emerged over the last 50 years or so, and has evolved as the needs of the research organisation have changed over time. Being such a new practice, the nature of the role of the commercialisation office and its employees (known as technology transfer professionals) has developed organically over time and varies considerably between institutions.

In recent times there has been increased external stakeholder pressures for research organisations to increase their commercial outputs. Via these communications, it has become apparent the lack of understanding as to what technology transfer is as a practice, and the elements required to successfully take research from publicly funded research organisations to market.

The need to professionalise

In response to the need to define a practice, KCA wanted to advocate on behalf of its membership the nature of the technology transfer role, and develop a tool for its members to use to better communicate the elements of the role to key stakeholders. Via some online research, it was realised that one way in which this might be achieved was through professionalisation, and creating tools and guidelines to try mitigate a number of the operational risks earlier identified.

KCA considered the 5 e's model of professionalisation for reasons of simplicity. Due to the aforementioned risks identified, KCA decided to first focus upon the specific technical and professional requirements of a successful knowledge transfer professional.

Existing Standards in Knowledge Transfer
The existence of professional standards (or more correctly, stamps of recognition of some competency) relevant to the technology transfer sector does not constitute professionalisation of the sector, but it is a relevant development. There are two key standards adopted by Technology Transfer Professionals in Australia: The Registered Technology Transfer Professional (RTTP), and the Certified Licensing Professionals (CLP).

Alliance of Technology Transfer Professionals
The Alliance of Technology Transfer Professionals (ATTP) was established in 2010 to provide a global standard of professional recognition. ATTP is a member association-based body comprised of nine national or regional technology transfer practitioner-led associations from around the globe. KCA is a founding member of this Alliance.

The Registered Technology Transfer Professional (RTTP) recognition
The Registered Technology Transfer Professional (RTTP) designation is ATTP's recognition that you meet the minimum requirements expected of a TTP. In essence it is a designation that reflects the highest quality expectations defined by the profession – it is a recognition that is earned by TTP who have demonstrated competency within their role in a TTO.

There are three routes by which an individual can earn their RTTP accreditation. These three routes have been designed to recognise the different ways in which an individual may have gained the knowledge and experience necessary to be a successful TTP. To date there are 300 RTTP globally, including 26 in Australia. Thus approximately 8 % of Australia's 315 TTP working in core technology transfer roles are RTTP. This percentage is high compared to the corresponding percentage in larger communities such as the USA and the UK. For example, USA has approximately 3,200 TTP (in 2012) of whom only 3% are RTTP.

However, despite this global accreditation process, the standard lacks theoretical underpinnings, and is poorly defined in relation to the specific capabilities that are explicitly required in order to successfully undertake the TTP role, particularly when viewed from an Australian perspective. Nor is it well understood what is required for a TTP to progress from the role implied by the initial accreditation standard to a higher role.

There also exists the Certified Licensing Professionals (CLP), a program that recognises professionals who have demonstrated their experience and proficiency in the licensing and commercialisation of intellectual property. The designation is built on internationally applicable standards of professional practice, and there are currently more than 900 practicing CLP designees worldwide involved in patenting, marketing, valuations, IP law, negotiation, and intellectual asset management. It is administered by a US-based foundation and built on internationally applicable standards of practice, knowledge and ethics to differentiate licensing professionals who have met examination and other requirements necessary to become certified.

The notable difference between CLP and RTTP is that RTTP goes beyond pure licensing, and recognises that commercialisation is multi-faceted and encompasses a broader skill-set. It is also the product of an international association that is trying to establish technology commercialisation as a profession in its own right, with a clearly defined entry criteria and a recognised professional development pathway.

CLP though extends the definition of the industry size to include lawyers or law firms that provide services for agreements, deal structuring and negotiation.

Conducting a research project

At the beginning of 2015, KCA was awarded a grant from the Professional Standards Council to undertake a study to determine the skills necessary to facilitate the successful transfer of knowledge between the research sector and business and government entities.

The goal of our study was twofold:

1. Determine the requirement for professional standards within the knowledge transfer practice in Australia, and outline any associated recommendations for the implementation of such a strategy if deemed appropriate.
2. Design a framework outlining the skills and competencies necessary to facilitate the successful transfer of knowledge between the research sector and business and government entities, to be used as a baseline tool for the professional development of practitioners.

The expected outcome of this project was to produce a framework for Professional Development across the research commercialisation sector. The framework will be used to identify where skills gaps exist within public sector research organisations, and will be used to suggest recommendations as to how to address these skills gaps. The framework will also seek to address the need for a more clearly defined career pathway for early career technology transfer professionals, and inform the way forwards in terms of KCA's overall professionalisation journey.

Project Methodology

Project Management

The project had three main contributors: gemaker (contracted to conduct it), KCA (the contract principal), and PSC (the funder). Given the nature of the project, the first of its kind in Australia for Knowledge Transfer, and the differing roles of the three contributors, a project steering committee was formed to guide the project and ensure expectations were managed and met. It comprised of at least two people from each contributing organisation.

Phases of the Project Methodology

The project included three phases of work, not including the production of the final report:

1. Conducting a literature review
2. Researching and drafting compilations of TTP capabilities (including capability clusters and sub-clusters)
3. Consulting and creating a final detailed TTP capability framework, plus analysing (i.e. identifying capability "gaps").

The project involved:

- Conducting a literature review.
- Conducting research via a series of workshops and interviews, including detailed survey questions; participants included Technology Transfer Professionals (TTP) and their stakeholders (e.g. research and development staff and industry recipients of Intellectual Property (IP) rights).
- Analysing the research interactively with its conduct and drafting compilations of TTP capabilities, including groupings and sub-groupings of capabilities (capability clusters and sub-clusters).
- Identifying skills gaps, i.e. the disparity between the capability clusters perceived to be required of the TTP and the capability clusters perceived to exist.
- Creating a detailed TTP Capability Framework based loosely on a Job Family Model developed by the Australian Public Service Commission. The framework created describes almost 200 capabilities desired of TTP. It incorporates seven capability clusters and sixteen sub-clusters as rows in a spreadsheet and three TTP seniority levels (early-career, mid-career and senior level) as columns in the spreadsheet. It also lists several professional values for some ethical considerations.
- Conducting further consultations and analyses in order to finalise recommendations for the implementation of the framework and for addressing the skills gaps.

Methodology: Literature Review

A literature review was conducted at the commencement of the project. The literature review provided information essential to the design and development of the workshops and interviews that were later conducted as part of the project.

The transfer of knowledge, including the bringing of innovations to market, requires a demanding composite of expertise, knowledge, skills, attitudes and values. Because of this complexity, the first part of the method adopted in the review was to assess how well the existing literature addressed such questions as: What do people who work in knowledge transfer actually do? How does knowledge transfer actually work? Subsequently, the review work focused on the more detailed aspects relating to the roles and capabilities of technology transfer professionals.

In addition to the review of publications and papers, the project team conducted a review of position descriptions and organisation charts for knowledge transfer work in a selection of universities and other public sector research organisations. This was used to compile a list of twelve to fourteen initial capability clusters to be used as discussion stimulus materials at the national workshops.

Methodology: Research and Draft Compilations of TTP Capabilities

The key deliverable of the project was a Detailed Capability Framework for TTP. The general approach taken to achieve this framework was to proceed in steps, commencing with a draft list of capability clusters, and then progressively increasing the relevance, accuracy and completeness of this list by creating a matrix inclusive at least of capabilities partitioned within the various clusters.
Inherent in this approach was the conduct of research in order to create the various drafts of the framework. Research was generally of two types:

1. Information was extracted from existing written sources, not just from the initial literature review, but also was extracted throughout the course of the project; and
2. Information, particularly in the form of opinion and comment, which was obtained from a reasonably large number of TTP and stakeholders via workshops, surveys and interviews conducted specifically for the current project; this data was collected from the participants interactively with the gemaker staff, and the data was deliberately allowed to evolve iteratively, thereby progressively creating more refined versions of the desired framework.

The results of the literature review provided the initial input to this research process. The literature review included searching of traditional sources, web-based sources, job advertisements and position descriptions. An initial categorisation of capabilities extracted from the literature review was made based on key words, sometimes used in the sources, resulting in twelve “first draft” capability clusters.

From here, numerous TTP and many of their internal and external stakeholders were invited to participate in national workshops in their local locations to assess the initial composition of capabilities. Workshops were held in NSW, VIC, QLD, SA and WA.

During the facilitation of these workshops, TTP participants were asked to identify role capabilities that they perceived to be the best fit to their work as a TTP. Stakeholders were asked a similar question regarding their perception of TTP work. Workshop participants could work either in a group or as an individual.

Using the twelve “first draft” capability clusters listed immediately above the participants were asked to:

- Add/ remove/ modify/ create capabilities that in their experience need to be included in the TTP work
- Collate them into roles or career levels

- Have input into roles outside their current role

Participants also discussed their thoughts around:

- Sharing a common language or terminology
- Naming the Job Family "Knowledge Transfer" or instead "Technology Transfer" or "Commercialisation"
- The type of capability framework (or matrix) that these capabilities could be framed under

Their discussion and choices were documented and collated at the end of each workshop. Upon completion of all of the national workshops, responses from all workshop participants were combined and the data was coded by provisional categorisation.

This data from the workshops formed the basis for a first draft of the Capability Framework, and further drafts evolved from subsequent surveys and interviews.

Methodology: Consulting, Creating and Analysing the Final TTP Capability Framework

The first draft of the framework was tested to see what was relevant within TTP roles. This was done by means of a survey of the TTP and a separate survey of their stakeholders. These surveys were additional to the research conducted earlier as a literature survey and as workshops.

The two surveys also provided the opportunity to determine what the skills gap in Australia is for TTP across different career levels. Here, the skills gap refers to the disparity between the capabilities that are perceived to be required in Australia and those that are perceived to exist currently in Australia. By necessity, to avoid confusion and unhelpful complexity, the skills gap was surveyed only at the level of thirteen or fourteen initial capability clusters (essentially the same list of clusters), not at the level of the much more numerous individual capabilities.

For the TTP participants in the survey, their inputs were collected through two different means: an online survey, and a manual entry that was collected at KCA's 2015 annual conference. In both cases, the questions put to the TTP were the same.

In the case of the stakeholders, targeted phone interviews were conducted on a one-on-one basis, supported by an online survey with the same questions for those unable to attend interviews. This was useful as it provided different perspectives from those of the TTP.

The survey data from the TTP and the stakeholders was analysed and reviewed to assess:

- capabilities missing from the draft capability framework
- that the capabilities were not simply tasks or evidence of those capabilities
- that the language and perspective used was consistent for TTP and their stakeholders
- that the grouping of capabilities into capability clusters and sub-clusters were accurately represented priority areas for TTP

From here, the capability framework for technology transfer professionals was developed based on the APSC Job Family Model (APSC = Australian Public Service Commission). Four tiers were created, namely job family, job function, job role and job title. The final TTP Capability Framework created was intended to apply across the entire technology transfer sector, and not scope the role of a single individual. Therefore these tiers were partitioned under three categories of seniority to allow for the creation and definition individual job roles and functions by practitioners.

Outcomes and Outputs

As mentioned earlier, at the outset, the goal of our study was twofold:

1. Determine the requirement for professional standards within the knowledge transfer practice in Australia, and outline any associated recommendations for the implementation of such a strategy if deemed appropriate.
2. Design a framework outlining the skills and competencies necessary to facilitate the successful transfer of knowledge between the research sector and business and government entities, to be used as a baseline tool for the professional development of practitioners.

As a result of conducting this research, KCA has created a high-level (basic) capability framework consisting of capability clusters and capability sub-clusters, together with a definition of the sub-clusters. In addition to this framework, KCA has identified "skill gaps" which is useful to the association to understand the type of training it needs to offer, and the specific skills sets it needed to nurture. (To clarify, the skill gaps are the disparity between the TTP capabilities perceived to be required and the TTP capabilities perceived to be existing (at the level of the initial capability clusters, not at the level of the later detailed list of final capabilities)). KCA has also considered the requirement for professional standards within the knowledge transfer practice in Australia, and will address some of these identified areas of need as outlined further on.

Project Lessons Learned

1. *Professionalisation Journey*: Professionalisation is a long-term journey! For a practice to convert to an official "profession," it takes time, resource and considerable commitment from practitioners. There are many pathways to becoming a profession, and many elements to consider. Upon embarking the journey, associations may realise that becoming a regulated profession is not the right move for them.
2. *Project Team:* The composition of the project team is crucial to success. It is very important to use professionals within the field you are conducting your research in that have the specialist knowledge to get you efficiently and effectively to the desired endpoint. KCA used human resource professionals to undertake the main body of work, not technology transfer industry professionals.
3. *Language*: Define this right up front. Defining your project terminology early will help with shaping the scope of the project, and it will also aid you better communicate with stakeholders what you are trying to achieve.
4. *Stakeholder buy-in:* Spend a lot time at the beginning of project getting stakeholder buy-in. Also follow up with stakeholders at the end of the project as to what happened and what the project outcomes were. Show them how to use the tool created. Without this you are just wasting your time with the project.
5. *Time:* Allow plenty of time to complete a project of this scale. KCA believes 18-24 months would be a better time frame for a project of a similar nature. This will give you more time to get that critical stakeholder buy-in, spend more time interviewing your stakeholders, and would also enable a second survey at the end of the project to survey stakeholders on the merits of the matrix produced.
6. *Money:* A project like this involves a lot of people and costs a lot in terms of staff time. In addition to this, make sure you budget enough money for sufficient marketing of the project and pushing out content to get better stakeholder buy-in. More money also gives you more time to survey stakeholders and respondents, and better communicate what you are trying to achieve.
7. *Project Steering Committee:* As part of managing the risks of your project, ensure members of your steering committee come appropriately prepared to meetings, and are encouraged to air any issues early on in the piece. Projects like this inherently are filled with risks around time, dollars and not meeting expectations, all of which can be very costly to a non-profit association if they are not managed effectively.

Next Steps: The KCA Professionalisation Journey Continues

Via the project conducted in conjunction with the Professional Standards Council of Australia, KCA has developed a detailed capability framework that outlines the skills and competencies necessary to facilitate the successful transfer of knowledge between the research sector and business and government entities. KCA has developed the framework as a baseline tool to develop practitioners, and as the first step towards professionalising. Reflecting upon the 5 e's model of professionalisation, this piece of work has highlighted the need for KCA to investigate the specific needs for a Code of Conduct and has helped to inform the way forwards in terms of the overall professionalisation journey.

Education

KCA deems that there are specific technical and professional requirements of individuals to facilitate the successful transfer of knowledge between the research sector and business and government entities. Technology transfer is a unique practice that straddles many fields, but which ultimately requires a precise sub-set of knowledge and understanding to undertake the role effectively.

In the context of professionalisation, to the extent that technology transfer should look to introduce entry-level formal qualifications or certification, KCA believes that at the present time, should not be the end goal. Rather it should be that KCA looks to define the types of skills and qualifications that would be highly desirable to possess to enter into and then progress into different roles related to the sale of intellectual property assets from PFROs. The number of roles related to this type of work in Australia is significantly small and to establish rigorous entry and training requirements for such a small number of people, given the negligible nature of the risks, is at this time unwarranted, and could possibly be counterproductive.

That said, KCA does see the need to offer formalised training to increase the rate at which individuals entering into sector can upskill and gain the needed understanding to do the role at a minimal level. Further to this, the results of our study revealed that some external stakeholders believe technology transfer practitioners require upskilling in certain areas, highlighting gaps in current skill sets which KCA should seek to offer training in.

KCA sees education as an area of focus for the association, and a crucial part of its professionalisation journey. However, establishing formal entry-level qualifications or certification is just not reasonable at this time. Rather, ongoing education and continuing professional development expectations are what will be strongly encouraged by the association.

Examination and Ethics

Given the identified risks around disparity of knowledge, skills and experience on both sides of the technology transfer professionals customer base, KCA sees the relevance of assembling a suggested set of guidelines around standards and ethics to help our members better communicate with their stakeholder groups as to what it is they can expect from engagement with them. KCA would look to do this as a mechanism for increasing understanding of the technology transfer practitioner's role and help members offer greater transparency around the process to improve the flow of activity and end up with a better result for all parties involved. While KCA as the association would not look to hold individuals or organisations to account should they breach these guidelines, KCA would hope that such guidelines would highlight the potential consumer risks associated with poor performance, and could be used as a tool by organisational managers to performance manage any undesirable behaviour.

Given that in this industry, organisations and their reputations have a tendency to be amassed into one, offering a set of guidelines which outline specific expectations of practice and conduct, and a commitment to a higher duty will hopefully encourage thoughtful practice amongst members.

Experience

ATTP (the international body, the Alliance of Technology Transfer Professionals) has in some sense taken a lead in examining individuals to assess and recognise their ability to undertake the technology transfer role effectively. What ATTP has not been able to do to date though, is assess individuals against named and known skills and competencies. RTTP is the global designation recognising excellence in technology transfer; KCA plans to work with ATTP to introduce our detailed capability framework into the assessment process, and use it as a tool to guide this current recognition mechanism.

Longer term, as the industry matures, KCA will assess the need to standardise job roles, office process and standards of service across the sector.

Entity

KCA recognises that for a profession to exist there must be a capable entity to oversee and administer professional entry, professional standards and compliance expectations. At the international level, KCA foresees ATTP as being a driving force to encourage professional entry, professional standards and compliance expectations being mandated by national associations like KCA - should the need arise further down the track. At the present time, beyond training and suggesting guidelines for ethical practice, KCA does not see a need for our industry to self-regulate, and we are confident that maintaining a level of standards will adequately manage the known risks of taking research from publicly funded research organisations to market.

KCA is working on creating a repository of KCA endorsed "standard" templates, policy and best practice guiding principles where applicable, for our members organisation's across Australia.

KCA's role in establishing a profession

Looking at the traditional role of the association in granting professional status, KCA does not believe that it should enforce tight controls around entry of employment; rather it sees its role as being one to recommend the required skill set and offer suggestion as to possible career pathway options. Selling science is not a science; it is an apprenticeship and mandating criteria and policing arbitrary restrictions would not be of use to anyone. In addition to this, unlike some other more established professions, entry points vary and roles differ within organisations.

Like many established professions, KCA has the ability to set parameters around benchmarking and believes that individuals are able to exert autonomous decision-making and acts according to their best professional knowledge. Like in many other established professionals like law and medicine, solutions to situations as they present themselves are not always black and white; like in such professions, individuals are required to draw on a known body of knowledge and experience to make an informed decision. Whilst this body of knowledge in our sector is not prescribed in a traditional sense, there is a role for KCA to offer guidance in this area via training and endorsing best practice.

Communication and Dissemination of Project Findings

The final report was recently launched at the 2016 KCA Annual Conference, and has be made available on the KCA website for other members of the profession to cite, as well as stakeholders, both internal and external. The final report will also be made available the international body for technology transfer, ATTP. ATTP has taken the lead in examining individuals to assess and recognise their ability to undertake the technology transfer role effectively, and KCA will work with ATTP to see how our detailed capability framework might be introduced into the assessment process, and use it as a tool to guide the current recognition mechanism for professionals globally.

Further to this, KCA has created a Toolkit to help members understand how best to use the framework to enhance technology transfer practices in Australia. KCA will also use the framework and the skill gaps identified as the basis for KCA training courses going forwards.