Great expectations

Developing "instruments for engagement" in university, business, government, and community relations

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Summary

Cooperation and collaboration between universities, business, government and the community is a major plank in innovation systems thinking. There is an expectation that stronger interactions and relationships will lead to improved productivity, performance, and competitiveness at the firm, regional and national levels.

Assumptions about the operation of innovation systems usually draw on transactional connections, such as IP commercialisation processes and collaborative research. Much attention is given to the roles and responsibilities of Technology Transfer Offices. This paper will argue that innovation system performance is enhanced through a progressive movement from transactional arrangements (the buying and selling of knowledge) to partnership arrangements built on trust and commitment.

There is a vast difference between the way innovation systems are described, and the way they operate in formal and even semi-formal ways. While most attention in the literature on triple helix type interactions is given to connections at the faculty and academic level, the reality is that relationships take time to develop, are underpinned and supported at the senior executive level, and must address business issues such as cost, risk and return.

Interactions and relationships are often formed on the basis of initial and informal personal contacts and through networks, by academics looking for funding for a research opportunity, or by businesses or their agents looking for solutions to a business problem. Many expect these relationships to be formed on the basis of a simple agreement between a researcher and a purchaser in business or government. Frustration arises when purchasers, particularly, cannot get the transaction actioned.

People in business and government also complain that there is often no 'shop front' or single entry point for the procurement of academic services—advice, analysis, research, short term and bespoke teaching and training, and other academic 'products'. However, universities are not set up to sell knowledge in this transactional context—and knowledge is a very difficult product to merchandise, particularly if it has not actually been created. A few universities have established entities to take on the role of merchandising "capability" using a consultancy/professional services model. These entities operate separately from a Technology Transfer Office.

Interactions between universities and business (and government) become formalised through a hierarchy of interactions, understandings and agreements that take time to develop. This is illustrated in figure 1.
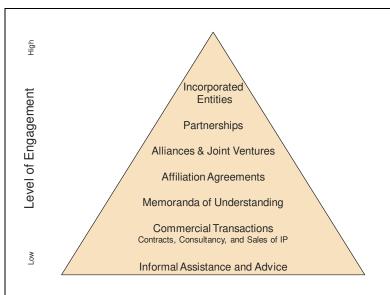
Figure 1: The University-Business Engagement Pyramid

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At the base is informal assistance and advice, then contracts for commissioned research and consultancy, licensing agreements covering access to intellectual property, to more formalised memoranda of understanding, affiliation agreements, strategic alliances and joint ventures, and finally to incorporated entities, such as a Cooperative Research Centre established under the corporations law, or new institutions entirely.

The movement from transactions to partnerships requires the development and application of skills and systems for the negotiation and execution of what are effectively "instruments for engagement" that involve executive level input from all parties and endorsement by CEOs and Vice Chancellors. There is an emerging role for brokers and intermediaries between universities and business and between academic and executive staff within universities.

This paper draws on experience and observations of the Canberra and Region Innovation System in Southeast NSW, Australia (Howard Partners, 2007a). It identifies the characteristics of the various "instruments for engagement" that are being developed and adopted, and addresses issues involved in their selection, negotiation, and execution.

The paper also draws on the experience of a University going through a major process of change and innovation in an increasingly competitive higher education market. This process, which commenced in 2007, has involved building up research capability and improving performance in teaching quality. Resource constraints required innovative ways to build capability and improve performance in these areas.

An important aspect of capacity building involved developing strong linkages with Government and business, the region, and the NGO sector as an innovation and engagement, or "third mission" strategy. This strategy has been clearly focussed on supporting the primary missions of teaching and research. In the process a range of instruments were developed and refined.

The narrative will be presented in the context of the body of knowledge created through the Triple Helix approach to university-government-business relations (Etzkowitz, 2002, 2008, Etzkowitz et al., 1998, Leydesdorff, 2001), prior research on institutions for engagement in innovation systems (Howard, 2004a, b, 2009, Howard and Sharma, 2006), and practice based research and consultancy undertaken for organisations including the OECD (State of Victoria, 2010), the Australian Research Council (Howard Partners, 2001a, b) and for Commonwealth and State/Territory Innovation, Industry and Economic Development Agencies (Howard Partners, 2000, 2002a, b, 2003, 2004a, b, 2005a, b, 2006a, 2007a, b, c).

The paper is practice oriented, but provides a base for developing links to the academic and scholarly literature on knowledge transfer and engagement—particularly in the areas of institutional and communication theory.

1 Missions and expectations

1.1 The Triple Helix context

The essential argument of the triple helix model is that universities, firms and governments each "take the role of the other" in interactions even as they maintain their primary roles and distinct identities (Etzkowitz, 2008). That is:

> The university takes the role of industry by stimulating the development of new firms from research, "introducing the capitalization of knowledge" as an academic goal. Firms develop training to even higher levels and share knowledge through joint ventures, acting a bit like universities. Governments act as public venture capitalists while continuing with their regulatory activities (Etzkowitz, 2008).

The triple helix model focuses on the university as a source of entrepreneurship and technology as well as a source of critical inquiry.

Universities exist for the purpose of scholarship. They are institutions for learning and for the creation of new knowledge. They generate income through fees paid by students (or by Governments on their behalf), research grants, Government grants for specific purposes and from endowments. Success is judged by the eminence of faculty and reputation of the institution.

Businesses exist for the purpose of serving customers. Income is generated by sales of goods and services that meet customer needs and satisfaction. Success is measured by profit, return on investment, and ethical behaviour.

Governments exist to address market failures - to provide public and collective goods which society, left to it's own devices would not supply, or supply in sufficient quantity. They generate income mainly from taxes levied on individuals and companies and from charges for goods and services. Success us judged by efficiency and effectiveness in policy and program delivery.

The growing interactions between universities, business and government in the creation and application of knowledge, suggests an intertwining of missions—as in the Triple Helix metaphor. But while the strands are in close proximity, it is by no means certain that they are unravelling to form a single chord. Each has to account and report to different constituencies in relation to funding, activity and performance. Disentangling the strands is often necessary for legislatures, councils and auditors.

Nonetheless, each element has expectations of the other—and the challenge is to identify and manage expectations to ensure that innovation system outcomes can be achieved.

1.2   Expectations concerning knowledge transfer

Universities are seen by businesses as important 'suppliers' of knowledge in the innovation system. Knowledge is supplied in the form of research outcomes, educated graduates, access to knowledge facilities and resources, and providing a physical and intellectual space for discourse in science, technology and the arts. Thus, a university is both a "knowledge factory" and a pillar for a civil society. A university can, and quite often does, provide leadership in economic, cultural, and community development.

Businesses want knowledge to increase productivity, enhance competitiveness and, generally to meet customer needs and expectations. Their main area of demand is educated graduates who are competent in a field of study and possess well-developed problem solving skills in a professional area. In the current climate businesses expect universities to produce more graduates to fill workforce needs—they want graduates to be 'work ready'. The expectation of 'work readiness' reflects a substantial shifting in the cost of training from business and government to the university sector in recent years.

Businesses want the outcomes of research—but research that is directed towards meeting their business needs and requirements. They are often prepared to pay for this research under various 'engagement' arrangements. Businesses tend to trust universities as being objective, but are often concerned about time frames and researcher commitment. Universities would like this research to have a new knowledge outcome that can be published in a peer reviewed journal. This is a second area of conflicting expectations.

Governments also want to recruit educated and competent graduates to work in policy development, implementation and review. They require these people to have disciplinary knowledge, problem solving and communication skills—and also to be 'work ready' for preparing the evidence base for new policy and policy change. This is particularly important for government agencies that have cut their in-house training budgets and limited their employment of

professionals. Governments also want universities to transfer knowledge to businesses, particularly small, innovative and entrepreneurial businesses, as these are seen to be major drivers of national competitiveness, productivity, and employment growth.

Universities want funding for their research agendas under the principle of curiosity led inquiry. Research is expected to be excellent, under a complex peer review system. Therefore, universities recruit and promote staff on the basis of research activity and performance. With limited funding from the public research councils, researchers look to businesses and government programs to support their research interests and portfolios. However, businesses and government also expect research to be relevant, and have impact in relation to strategic and public policy outcomes. Reconciling expectations relating to excellence, relevance and impact is a major challenge.

These expectations raise important issues relating to how universities can best work with business, government and the community, and the type of relationship that is most appropriate to the situation and circumstances. These relationships are often addressed in the context of the 'third' mission of universities and the processes for knowledge transfer that are expected to drive and sustain innovation.

The relationships between universities, business and government becomes more important with a greater understanding of the connection between knowledge creation, knowledge transfer and economic and industrial progress.

1.3   The 'third mission' of universities, knowledge transfer and innovation

The third mission of universities is variously identified as service, outreach and extension. It is essentially about knowledge transfer for adoption, application and use in business, government and community contexts. It has, therefore, an important innovation context and provides a link in the structure, operation and performance of national and regional innovation systems. However, although universities are generally seen as critical components of regional innovation systems, the way in which knowledge and ideas are developed, communicated and applied is complex, involving interactions and relationships in numerous forms and multiple levels.

Australian context

In Australia the actual processes for knowledge transfer receive little policy attention or support by Commonwealth or State/Territory Governments. Most attention is given to technology transfer and the commercialisation of research. But this form of interaction is probably the least important of university-business interactions in the overall context of innovation and the third mission. There is, nonetheless, little interest in the third mission as a standalone public policy objective—notwithstanding the important role that universities have in economic, cultural and community development. These impacts are seen as a by-product of the teaching and research missions.

Even though Governments acknowledge the link between higher education, new knowledge creation, and economic development, the Commonwealth Government has traditionally taken the position that, apart from fiscal, monetary and international trade policies, economic development policy is largely a matter for State/Territory Governments. But the States/Territories believe that funding higher education, covering both research and teaching, is a responsibility for the Commonwealth. Only Victoria and Queensland have an active higher education and research policy. There is no regional dimension to higher education policy. The newly created Department for Regional Australia and the 55 Regional Development Australia Boards do not have a specific higher education remit.

The Commonwealth Government takes an active interest in the commercialisation of publicly funded research and supports the publication of regular surveys of research commercialisation in universities and publicly funded research entities. It supports early stage venture capital and enterprise development programs, which are accessible by universities, but it does not support

capacity building for knowledge transfer in universities—such as the Knowledge Transfer Partnerships program in the UK.

The Commonwealth's $6 billion Education Investment Fund (EIF), a program administered by an independent board and advised by the two Departments responsible for higher education and research is about to launch a funding round specifically directed to the creation and establishment of university campuses outside the major metropolitan areas. It is expected among regions that funding will deliver economic benefit outcomes. However, the fund is for infrastructure and only a small amount is available for operational purposes. It does not provide funding to support 'third mission' outcomes.

A small number of local governments have turned attention to the role of higher education in economic development, and have been developing strategies that involve a greater role for universities in their region. A number of Councils have achieved success in facilitating the development of relationships between universities, vocational colleges, state education departments, businesses, and economic development boards. But, developing and implementing strategies takes time and resources and involves close attention to the way economic, social, cultural, and community outcomes will be delivered.

Implications

Despite expectations from industry and the community of a greater government role in knowledge transfer (Academy for Technological Sciences and Engineering, 2011), the reality is that the application of the third mission concept in Australia is largely left to universities to address in the context of their own teaching and research missions.

The driving interest for universities relates to the way third mission activities can complement and support the first two missions of teaching and research. It is therefore not surprising that few universities have consistent and coherent policies and processes for engaging with business and government. They feel reluctant to cross subsidise knowledge transfer initiatives from funds sourced from government and students, particularly international students, for the purposes of teaching and research. Moreover, few universities expect to make money from third mission activities.

Notwithstanding the absence of specific programs and initiatives, the reality is that there is a high level of interaction, engagement and knowledge transfer between universities, business and government. Much of this goes unmeasured as it occurs in the context of teaching and research missions, as well as in a context of universities operating as businesses in a broader industrial and economic development system. Senior executives in universities participate in business networks in their role as major employers, investors, and purchasers of goods and services in a city or region—as well as suppliers of human capital and talent.

Apart from research and technology transfer, businesses interact with universities through recruitment, executive education, and alumni relations. Many businesses are formalising interactions through corporate relations programs and appointment of staff to manage the role. In parallel, universities are looking to formalise relations through the development of industry and government engagement strategies.

A greater understanding of the way in which universities engage with business, government and the community through a variety of instruments, will provide a basis for the formation, development, and implementation of policies and programs that will deliver benefits to all participants in the triple helix framework as well as making a contribution to improved performance of regional innovation systems.

2   Framework for knowledge transfer

Drawing on aspects of communication theory, it is possible to identify four modes of knowledge transfer. Each mode is characterised by differing levels of involvement on the part of creators and users of knowledge in developing knowledge content and in delivery. These modes are represented in Figure 2.

Figure 2: Modes of Knowledge Transfer

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Comments on each mode and the implications for knowledge transfer, innovation and engagement follow.

2.1   Knowledge transfer through 'telling'

Telling is the traditional 'extension' approach to knowledge transfer. It is embedded in the concept of a lecture and a publication. It is a one-way form of communication and assumes that the teller has knowledge, skills and experience that would be of benefit to people and organisations that adopt and apply the knowledge in business, government and community contexts. Universities have programs for public lectures, professorial lectures, and endowed lectures designed to "disseminate" knowledge and create a profile for the University.

University academics write books and papers for publication in the academic press as well as preparing articles for publication in business and professional magazines. Sometimes, this work is 'translated' into a less scholarly format. This latter form of communication assists in building readership as few people in executive positions in business and government read (or comprehend) the content of academic journals.

Universities also inform industry, government and the community of new developments in knowledge through publicity, promotion and regular reporting in annual reports, alumni magazines and newsletters. Academic staff also provide commentary on contemporary issues and current affairs in newspaper columns and op-ed contributions. More recently, universities have adopted different forms of social media, including Twitter, Facebook and blogs, to broadcast information including new developments and opportunities for education and research.

It is often thought, however, that businesses have difficulty in their capacity to 'receive', 'adapt', and 'adopt' discoveries and innovations generated through the public research system. In other words, the market is perceived to fail in revealing the opportunities available from public research for application and use in business. Researchers and research organisations have limited incentives and reward to 'market' their discoveries and inventions to business.

The poor 'receptor' capability in business for discoveries and inventions has been seen by some as an inhibitor in Australia's industrial progress. But, a firm's capacity to absorb information depends not so much on the amount of knowledge and information that is available, but on its capacity to receive. Rarely is information or knowledge available in a way that firms can immediately adopt and apply. Externally available information and knowledge often requires translation into a form and format that can be received, understood and acted upon by a firm's *decision makers.*

Knowledge Absorption in the Fire Services Industry

The way in which decision makers, operational employees and volunteers in Australia's fire services industry identify, access and receive relevant and applicable knowledge was studied in detail by Howard Partners in a recent assignment for the Bushfire CRC (Howard Partners, 2006b).

The project focussed on the type of information and knowledge that decision makers would like to acquire from external sources and how it could be made available[1].

Social networks, trust based relationships, and acknowledged 'experts' were identified as critical for absorptive capacity— and as complements to formal structures and systems.

As telling is a one way form of communication, the extent to which knowledge is received, adopted and applied is very difficult to ascertain. Intermediaries, acting as knowledge brokers, are seen as having an important role in translating and transferring knowledge for application and use in business, government and the community.

2.2　Knowledge transfer through selling

Selling knowledge, or commercialisation, is a concept that has captured the imagination of policy makers, venture capitalists and a range of other participants in the national and regional innovation systems. In the strictest sense of the term, commercialisation involves efforts to sell the work of universities for a profit (Bok, 2003).

In the domain of knowledge transfer, the underlying concept of commercialisation is a commercial transaction—involving the sale and purchase of a "knowledge product". Knowledge products, as well as knowledge services, can be created, owned, licensed, sold and purchased in an exchange transaction. Knowledge products are generally represented as an Intellectual Property Right (IPR), such as a patent, design, or copyrighted material.

The ability to vest Intellectual Property Rights in discoveries and inventions allows them to be recognised as capital and collateral for the formation of new businesses either in existing firms or for application and use in new firms. Although most interest in commercialisation relates to patented discoveries and inventions many universities generate substantial revenues from sale of copyright, such as in multimedia materials.

There are examples where universities have generated substantial returns from discoveries through licenses and sales of equity in start-up companies. But in an overall context, the returns to universities from research commercialisation are quite small, and substantially less than returns from other forms of knowledge transfer. The returns from commercialisation in Australia's 39 public universities for 2008 and 2009 are provided in Table 1.

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[1] The report can be viewed at http://www.howardpartners.com.au/work-in-progress/Fire_Knowledge_Network_Report.pdf

Table 1: Australian Universities—income from licences, options and assignments (LOAs) of IP

	2008		2009	
	Number	Value ($m)	Number	Value ($m)
Running royalties	127	47.0	141	38.5
Cashed in equity	3	0.8	3	0.5
Other transactions	175	24.1	174	18.0
		71.9		57.0

Source: *National Survey of Research Commercialisation 2008 and 2009* (Department of Innovation Industry Science and Research, 2011)

In 2008, only 38 percent of LOAs held by Australian universities yielded income. These are concentrated in a few universities–predominantly the Group of Eight (research intensive) universities. In terms of the level of income received for research, the return through commercialisation is minimal. It is acknowledged, of course, that universities seek to protect IP created through research for reasons other than generating income.

Start-up company formation was a significant avenue for commercialisation in Australia during the technology boom of 1999-2001. Most of these companies were engaged in activities initially based on the assignment or licensing of IP from universities. A significant component of this activity relates to further research and development with a view to selling a product or service. Indications of start-up company activity in Australia's 39 universities are provided in Table 2.

Table 2: Australian Universities—start-up company activity

	2008		2009	
	Number	Value of equity ($m)	Number	Value of equity ($m)
New start-up companies formed	12	97.4	24	111.8
Start-up companies with institutional equity	146	n.a.	152	n.a.

Source: *National Survey of Research Commercialisation 2008 and 2009* (Department of Innovation Industry Science and Research, 2011)

Start-up companies formed on the basis of university generated IP are only one form of company formation based on the application of knowledge generated and acquired by university staff and students. Many students leave university to establish their own businesses in areas of technology and creative practice. There tends to be little formal IP involved but their creation is based on know-how and skills in innovation and entrepreneurship.

In Canberra (Australia) for example, there are many successful companies that have been created by graduating students from the University of Canberra in architecture, design, communications and media. Graduates in law, accounting and allied health also establish their own companies, often built around a particular expertise or to address a niche in the market. A sample listing of companies started by University Alumni is provided in Attachment 1.

Companies formed by Alumni also recruit additional university graduates and collaborate with the university in teaching and research under various engagement arrangements. The significance of this category of 'start-up' company in knowledge transfer has not been recognised or studied to any significant extent.

2.3   Knowledge Transfer through consulting

Consulting involves the provision of expert advice to solve a problem or capture an opportunity on the basis of knowledge and expertise held by a member of staff. It is generally undertaken on a fee-for-service basis and relates to a specific and definable process and outcome requirement. It does not have as an objective new knowledge creation, although this may flow from the project.

Consultancy may also cover customised (be-spoke) training and professional development—courses and programs developed for business, government and NGO clients; Expert Advisory Services—

relating to areas of capability and competency in the university; and fee for service testing, analysis, and investigation using laboratory, scientific equipment and other knowledge related resources[2].

The value of research contracts and consultancies for all 39 Australian universities in 2008 and 2009 is indicated in Table 3 below.

Table 3: Australian Universities—value of research contracts and consultancies

	2008		2009	
	Number	Value ($m)	Number	Value ($m)
Research Contracts	7,128	736.7	6,949	658.7
Research Consultancies	3,096	115.3	3,222	132.4

Source: *National Survey of Research Commercialisation 2008 and 2009* (Department of Innovation Industry Science and Research, 2011)

In 2008 the value of research contracts and consultancies ($852m) represents 30.3 percent of the $2,809.7m in total research income received by Australian Universities and Cooperative Research Centres. This proportion varies considerably between universities.

University and Faculty Research Centres and Institutes often seek contract and consultancy work as a way of building capacity, generating income, and cross-subsidising discovery and curiosity driven research programs. Success in this area is associated with an established client base, strong reputation for quality and on-time delivery, and capacity to communicate in a language and style that is understood in Government, business and the community.

In Australia, universities are often preferred suppliers over private sector providers for consulting services work due to perceptions of greater expertise, quality and value for money. However, universities are under an obligation to ensure that professional services work meets Competition Commission criteria of competitive neutrality, it does not create undue risks, and it does not generate losses which must be covered from elsewhere.

A number of universities have established companies or service units to work in the professional services market, with the intention of generating income and profits. These companies compete with private suppliers including boutique consulting firms, and the larger management consulting, accounting, legal, and other professional service firms.

Universities probably do more consulting than they know about as staff might channel the proceeds of consulting through their own private/family businesses or work under a contractual arrangement with a larger consulting/professional services firm.

2.4   Knowledge transfer through engagement

The reality is that knowledge transfer through commercialisation only accounts for a very small proportion of knowledge transfer activity from universities to industry, government and the community. The value of research contracts and consultancy is significantly higher, but again, only captures a relatively small picture of overall knowledge transfer activity.

A more dynamic and interactive view involves thinking about knowledge transfer through engagement (Hughes et al., 2009). Whereas knowledge transfer through commercialisation is a transactional process knowledge transfer through engagement is a relational process—built on strong foundations of collaboration, partnership and trust.

For most universities, tangible evidence of these relationships is provided in an extensive portfolio of adjunct appointments, memoranda of understanding, affiliation agreements, and partnerships, with government agencies and business and community organisations. At the highest level, engagement

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[2] Consultancy does not include preparation and publication of books or articles, delivery of occasional outside lectures and performances, media appearances, writing a regular newspaper column, service on government committees and statutory bodies (including Australian Research Council Committees), professional associations, and charitable, sporting or other like organisations, refereeing articles in learned journals, examining and assessment at a tertiary level, and book reviews. These are regarded as normal academic workload.

is reflected in a formal teaching and research collaboration in a research centre or joint venture organisation.

Engagement relationships may commence through informal and formal networks, business membership of course advisory committees, academic staff membership of business, professional and community organisations and conclude with senior university staff taking leadership positions in business and the community to further regional innovation objectives and outcomes.

Engagement also addresses the social, cultural and environmental impact of innovation, and arguably, the impact is more significant than the economic impacts of innovation through commercialisation. Moreover, engagement relationships take time to develop, and a financial return may take many years to materialise. Arguably, however, engagement relationships are deeper and more sustainable than transactional relationships.

2.5 Categories of knowledge transfer relationships: markets, networks and organisations

Drawing on some insights from institutional theory (DiMaggio and Powell, 1991, Scott, 2001, Williamson and Winter, 1993), it is possible to group the modes of knowledge transfer into three distinct categories of interaction between universities and business, government and communities. These are:

- Market based – transactional relationships – consulting and commercialisation;
- Network based – engagement relationships;
- Organisationally based – integrated relationships that reflect an outcome of an engagement relationship.

Each has specific characteristics and features relating to the nature and level of engagement, timeframe, and outcome (Howard, 2004b, Johnston and Howard, 2003). As the nature of relationships moves from the market based and transactional, through networks, to the organisational, interactions become more strategic. They tend to involve progressively higher levels of interaction in each institutional hierarchy.

Research indicates that businesses that do not participate in networks or other forms of non-market based interaction along the value chain are unlikely to succeed. There is a growing recognition that markets are *social* as well as economic institutions (Fligstein, 2001, Kay, 1995, 2003), and that businesses, or more particularly business owners and managers, conduct business on the basis of personal contacts and relationships established through a range of formal and semi-formal organisations and 'communities'.

Each category of interaction is supported by a number of relational 'instruments'. Various instruments have achieved attention in the literature but their properties and features and the way in which they operate has achieved comparatively little attention. A typology of relationship instruments is outlined in Figure 3.

Figure 3: University—Business, Government, Community interactions: a typology of relationships

Form of Relationship	Transactional/ Contractual	Community/Networked	Organizational/Managed
Features	Exchange relationship	Mutual, reciprocal relationship	Formal, Strategic relationship
Examples	IP Licensing, sale and assignment Contracts for the purchase of knowledge services Competitive funding schemes Student recruitment—selling 'places' under a demand driven system Business ventures – including start-up companies established for commercialisation of IP Sponsorships, donations, gifts, sale of naming rights Property development: science and technology parks, commercial leasing, innovation centres	Personal friendships and private contacts Business, professional and alumni networks Membership of industry, professional and community organisations Adjunct and honorary appointments Course Advisory Committees Service learning Conferences, exhibitions, displays, showcases Boardroom and Council room discussions	Memoranda of Understanding Affiliation Agreements Joint Venture Agreements – Covered by executable deed, such as a research agreement Centres for teaching and research Partnership agreements Incorporated entities
Orientation	Sales and marketing	Engagement, commitment	Integration, collaboration
Outcome	Creates a sale, a deal	Builds understanding, trust	Creates strategies
Time Horizon	Immediate	Medium term– 1 – 3 years	Long term 3-10 years
Level of relationship	Middle level/operational managers, TTO staff, research active staff	Senior managers, Deans and PVCs	CEOs, Vice-Chancellors, DVCs

Aspects of a these forms of relationship are addressed in the remainder of the paper.

3 Transactional/contractual relationships

The evolution of the knowledge economy has seen the emergence of knowledge products reflected in forms such as patents, copyrighted materials, courses, and a range of advisory and consultancy services. These products are sold, and purchased, in a market—a place where buyers and sellers meet. Knowledge markets, as with any other markets, have distinctive characteristics: they are focussed on a transaction, or exchange, that delivers value to both the creator and the user. Value relates to expectations, benefits and costs incurred by each party to the exchange.

Market forces power the movement of knowledge, working in a similar way to markets for tangible goods:

> Like markets for goods and services, the knowledge market has buyers and sellers who negotiate and reach a mutually satisfactory price for the goods exchanged. It has brokers who bring buyers and sellers together and even entrepreneurs who use their market knowledge to create internal power bases. Knowledge market transactions occur because all of the participants believe they will benefit from them in some particular way. (Davenport and Prusak, 1997)

There is a risk, however, that the market metaphor creates a perception of a university as a knowledge vendor that a company or government agency can outsource projects, acquire technologies and obtain low cost consulting. The result is that businesses end up viewing the university "in much the same way a homeowner or do-it-yourselfer views the Home Depot Inc—as a

warehouse full or products and advice. But seeing a university in this way rarely produces significant outcomes for a business" (Wright, 2008). For example:

- The focus is on the transaction, or the 'deal', for ready to license discoveries or inventions–rather than discussing their basic business and how it works
- Deals are done at an operational level, with the prime motivation to get a bargain
- Businesses seldom get to understand and value the full spectrum of resources that are available to them
- Faculty staff are seen as technical specialists rather than experts who may be able to shed light on major issues.

Aspects of transactional relationships in universities are outlined below. Attention is drawn to the importance of establishing supporting engagement relationships and the role of brokers and intermediaries. The role of intermediaries is addressed in more detail in Section 5.

3.1   IP licensing, sale and assignment

IP licensing, sale and assignment is a transactional relationship with clear commercial outcomes. As indicated in Section 3 above, few universities make money out of this activity. Moreover, universities and university researchers also tend to over-value their discoveries and technologies—overlooking the substantial investments along the value chain that are required, and the risks that must be managed, to bring a discovery or invention into application and use.

There are many who still believe that there is a 'treasure trove' of inventions and discoveries sitting in universities waiting to be commercialised. Technology Transfer Offices are constantly being criticised for not acting quickly or competently to realise value for researchers, the university and the nation. The reality is that most discoveries are not at a stage where commercial exploitation could be considered or a commercial application could be validated. Where there is a commercial opportunity, interested venture investors often get to hear about it through their own networks (Howard Partners, 2001a).

There is an emerging trend for universities to assign ownership of IP to staff who created it with the implication that staff, or other entities, would be responsible for is commercialisation. There are, complications with this approach not least of which is clarity of ownership between researchers and institutions when a venture investor wants to commercialise an invention or discovery. Technology brokers and advisers are taking an increasing role in this area.

In many areas IP ownership merely provides a platform for more lucrative contract research and consultancy opportunities. That is, the value of a discovery or invention is not so much in the intellectual property right, but in the way it is used (and leveraged) in cooperative and collaborative forms of engagement. Also, in some situations, attempts to sell an IP right will raise complex issues about claims of ownership by other institutions where staff have worked previously, and ownership of IP by students.

3.2   Contracts for the purchase of knowledge services

As indicated, businesses and government agencies tend to see universities as knowledge vendors, or warehouses. They look for the 'front door', 'entry point', or 'service counter' to view the knowledge merchandise and capability on offer. Small businesses particularly expect easy access to post graduate students and junior staff to work on business plans, marketing strategies and technology assessments—at a low or no cost. Some have a view that these services should be provided for free in a misplaced belief that public universities are largely funded by the public[3].

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[3] In Australia the Commonwealth Government contributes less than 40 percent of public university revenues; state and local governments contribute virtually nothing in all States/Territories)except Victoria and Queensland.

Many are disappointed when university staff do not respond quickly, or at all, to an intended purchase relationship. Most Universities have provisions in their Enterprise Agreements that cover academic workloads that must be negotiated and agreed with a Dean or Head of a Research centre. These cover time for teaching, research, committing to professional practice, supervision of higher degree students, administration, and external engagement. Universities also have policies and procedures covering staff paid 'outside work'. The time available for consulting and advisory work for business is severely constrained.

Some companies and private consultants avoid contact with University management in securing access to staff for consulting and technology assessment. This work may be undertaken in a staff member's private capacity, in their own time and at their own risk. Some universities are moving to a position where such work is not forbidden—but must be undertaken in a way that does not impinge on a staff member's obligations to the university or involve any risk to the university. This generally means not using a professorial title or utilising university resources—equipment, laboratories or support infrastructure. In Australia this is being applied to health sciences academics operating private clinics or taking on private patients.

At the same time, university research-active staff also tend to approach the sourcing of research income from business and government on a transactional basis. They seek funds for research projects through a solicitation and marketing approach—often based on the significance and importance of their research interests rather than the value of the outcome. Staff are motivated towards this approach as one of the key university performance metrics is how much research income is generated. Satisfactory contract performance, or even project completion, may not enter into the appraisal.

There is a risk in the direct solicitation approach that different researchers will approach the same people in business and government to support their research interests. The problem is not unique to universities—consultants in professional services firms with KPIs based on income may also independently approach the same clients. Incentives to work as teams within and across faculties, and effective Client Relationship Management (CRM) systems can work towards resolving this problem and build more profitable linkages and relationships through an engagement strategy. The culture of a university, organised around academic disciplines and individual performance appraisal, can work against team based approaches.

Universities are also appointing people at senior management levels to have a responsibility for engagement. This role involves building a profile in the business and government community and adopting an intermediary and mediating role. These roles are quite different from the essentially transactional roles of a Technology Transfer Office managers.

3.3 Competitive funding schemes

Competitive funding for research, through the processes of peer assessment, is a well accepted aspect of the academic landscape.

More recently, Australian governments have introduced competitive funding programs for infrastructure and other capital investments. Program selection criteria are issued, universities prepare submissions (often with the help of consultants), assessments are made by technical experts, decision makers are advised, and funding allocated under a formal funding agreement, or contract. During this process there is very limited opportunity for universities to engage with the funding agency to ask questions and seek clarification in case that might give the institution unfair advantage over competitors.

Some competitive programs specifically encourage collaborations between universities, businesses and government agencies. It is unfortunate, however, when collaborations are formed simply to access money rather than having been built up over time with clear strategic objectives and a clear

understanding of synergies in capacity and capability and a strong commitment to the outcomes that can be realised through engagement. Commitment to an outcome, rather than a motivation to access money, is more likely to achieve sustained results.

Competitive arrangements, based on a procurement model, move away from forming closer engagement arrangements between universities and government. Businesses, by contrast, are moving in the other direction—discussing requirements at a senior level, and getting to know what a university has to offer. At MIT it has been noted that businesses have become more adept at building dialogues between senior executives and senior faculty within problem solving frameworks of their companies (Wright, 2008). Similarly at Cambridge, UK multinationals value collaboration far more than access to university developed technology (Ternouth and Garner, 2011).

3.4   Student recruitment

With public policies that provide for greater access to higher education, strategies to recruit students are becoming increasingly a transactional relationship. In Australia universities effectively 'sell' places for students in courses and programs as a pathway to the award of a degree, diploma, certificate or other qualification. Many regard these as 'positional' goods. Up until the end of 2011 the number of places that receive Commonwealth financial support has been 'capped' in accordance with an institutional profile. The number of fee paying international students is not regulated.

Competition for students in Australia will become more aggressive from 2012 as enrolment caps are removed and a demand driven funding arrangement is implemented. That is, Commonwealth funding will 'follow the student' in an environment of student choice. The available evidence is that student choice will be determined by perceptions of quality and employability (Ernst & Young, 2011). Innovative universities will create their own market by envisioning what students and employers will want in a new teaching and learning environment and opportunities for the application of technology and new forms of delivery (Christensen and Eyring, 2011).

Future success in student recruitment is likely to be built around an engagement strategy that establishes contact with future students *and* their parents, employers and peers at an early stage and builds a relationship over a period of time. In this environment it is important to build brand, establish reputation, and create a trust based relationship—that an institution will deliver on the promise of quality, experience and employability. The role of Alumni, other networks and referral points will be critical in establishing this relationship.

3.5   Sponsorships, donations, gifts

Universities build relationships with business and the community through targeted sponsorships that build profile and indicate commitment to business and community objectives. These are essentially transactional relationships—there is an expectation of early return from the funds provided under a sponsorship.

Universities have developed policies and programs to secure funds to pay for buildings, facilities and equipment and academic positions. There is a growing understanding that people will give to a university for a wider social purpose, such as sport, social causes, equity/access, value of teaching and research to achieve broader community outcomes. To the extent that there is an expected outcome on the part of a giver, the relationship is transactional in nature. Invariably, however, large donations and bequests are sourced from people, companies, and foundations where a relationship has been developed over a number of years.

In Australia universities are now developing policies and strategies to sell naming rights to professorial chairs, buildings, laboratories, lecture halls, conference centres, parks and walkways as a means to raise revenue for teaching and research purposes. These are transactional relationships in that a company is receiving profile through an association with a university.

3.6 Business ventures

In addition to start-up companies established for commercialisation of IP, universities are involved in a variety of business ventures. These include conference centres, food outlets, student accommodation, the development of campuses, and management of competitive sporting teams. These may be run by a university, outsourced, or operated as a joint venture company. In Australia, universities tend to avoid part ownership and taking non-controlling interests in businesses undertaken through a 'related entity'.

Under the National Governance Protocols for Higher Education a university is required to assess the risk arising from its part ownership of any entity, including an associated company, partnership and joint venture. In light of the risk assessment, a university council is required to "use its best endeavours to obtain an auditor's report (including audit certification and management letter) of the entity by a State, Territory or Commonwealth Auditor-General or by an external auditor".

3.7 Property development

Many universities have established science and technology parks, innovation and enterprise precincts, with a stated aim of supporting innovation, knowledge transfer and building links with businesses. Success in these ventures is most often viewed on a transactional basis—the ability to achieve a satisfactory return on an investment in commercial buildings and property development.

Australian Technology Park

Established on almost 14 hectares of campus inspired grounds, and featuring a unique integration of heritage architecture, premium commercial space and state-of-the-art conferencing facilities, the Australian Technology Park in Sydney is host to leading Australian and global IT, communications and science companies.

Since its inception, the Park has evolved into one of the nation's pre-eminent technology and business precincts. The Park offers a unique and inspiring environment for collaboration, information exchange and knowledge-sharing, while ongoing site development and an ever-expanding tenant portfolio secure the Park's position at the forefront of Australian technology growth and commercialisation.

Conceived by a consortium of Sydney universities in 1995 and now wholly-owned by the New South Wales Government's Redfern-Waterloo Authority, the Park is located just a few kilometres away from Sydney's CBD and international airport on a site once occupied by the Eveleigh Railway Yards.

The park is run as a business with the Board conspired by leading Sydney corporate identities. The Board does not have a member with an academic background.

Universities with substantial land holdings are looking to capture returns and supplement income for teaching and research purposes by becoming active property developers.

4 Networked based interactions

Innovation, when practised successfully is invariably done within communities, among diverse individuals who share a common purpose. In business, real innovation is much more collaborative than at first appears (Senge, 1999). Most of the important relationships within the world of business may not be contractual. Where transactions involve an element of uncertainty or risk, people like to do business with people they know, like, and trust. Trust is created through the reputation, integrity and credibility of parties to a transaction (Bibb and Kourdi, 2004, Gupta, 2002, Lewis, 1999, Maister et al., 2000). Trust may take many years to establish—and can be easily dissipated.

Academic and scientific communities have thrived for centuries around collaboration and community based allegiance. Academics go to conferences to 'give' papers, not to 'sell' them (Johnston and Howard, 2003). Increasingly, it is argued, the academic community is being extended, or new communities formed between universities and businesses, in the forms of alliances,

networks and clusters. It is this form of interaction that was captured by the 'Mode 2' model. (Gibbons et al, 1994).

The community/networked dimension stresses the importance of building "social capital", that is, the stock of active connections among people: the trust, mutual understanding, and shared values and behaviours that bind the members of human networks and communities and make cooperative action possible. This type of connection supports collaboration, commitment, ready access to knowledge and talent and coherent organisational behaviours (Cohen and Prusak, 2001).

The following forms of networked based interactions between universities and business may operate in a regional innovation system. These forms of interaction can form the basis for the development of metrics relating to engagement.

4.1 Business, professional, alumni and community networks

In relatively small communities there are deep connections between people through business, professional, alumni and community networks. These can form a base for developing understandings about the activities and interests of a university and can lead to more formal interactions.

Alumni networks are important not only for sourcing and securing philanthropy, they are also important for graduates to maintain contact with staff, students and colleagues. Universities that invest in Alumni networks ensure that contact between academic staff and graduates who have succeeded in business and government is maintained. These connections can be vital for building longer term partnerships and collaborations.

Although alumni can be important for fundraising (although alumni gifts make a very small proportion of the total fundraising effort), some universities have de-coupled the link between alumni relations and philanthropy with a view to strengthening the alumni role in building university-business relationships and engagement. This is an acknowledgement that alumni can contribute in many ways other than through philanthropy.

4.2 Memberships of industry, professional and community organisations

In many universities, executive and senior academic staff are encouraged to participate in the work of industry, professional and community organisations. This provides the basis for developing strong personal linkages as well as ensuring that there is understanding of the missions, objectives and priorities of industry, professional and community development. By way of illustration, the University of Canberra holds corporate membership of the following organisations in the Canberra and Capital Region:

- ACT and Region Chamber of Commerce
- Australian Universities Community Engagement Alliance
- Australian Services Roundtable
- Canberra Business Council
- Canberra Convention Bureau
- Council for the Humanities, Arts and Social Sciences
- Green Building Council

Executive and senior academic staff hold board positions on many of these bodies. These roles have proved to be important in building connections and initiating collaborative agreements in both teaching and research.

4.3   Adjunct and honorary appointments

Many universities have developed policies and processes for appointment of people to adjunct and honorary positions to strengthen teaching, research and professional activities and to foster co-operation with national and international academics, and business, professional and cultural communities. Honorary appointees from industry, government, and the wider community are generally expected to contribute through:

•   Teaching in award and non-award courses
•   Delivery of occasional lectures, workshops and symposia
•   Supervision of higher degree research students
•   Participation in research programs and projects
•   Assisting in a more general way to the work of the university.

In addition, honorary appointments provide a formal association and linkage with people in professional practice involved in the formal delivery of university courses and programs—particularly in the clinical and allied health domains. While appointees supplement and complement the academic activity and expertise of the University, they are not an alternative to the normal competitive recruitment and appointment processes undertaken by a university for the employment of academic staff.

At the University of Canberra there are just under 200 adjunct professors and associate professors currently holding appointments. Appointees are high profile people from business, government and the community. All are expected to contribute to teaching and research outcomes. Care is taken to ensure that an adjunct appointment is not seen as a 'trophy' by appointees. The distribution across faculties is indicated in Table 4.

Table 4: University of Canberra - Adjunct Appointments

Faculty	Adjunct Appointments		Full Time Appointments	
	Professor	Associate Professor	Professor	Associate Professor
Applied Science	8	8		
Arts and Design	17	9		
Business and Government	21	10		
Education	8	6		
Health	20	31		
Information Sciences and Engineering	14	4		
Law	13	7		
ANZSOG Institute for Governance	0	2		
Institute for Applied Ecology	8	5		
National Centre for Socio-economic Modelling	1	1		
	110	83	41	47

In 2010 the number of scholarly publications attributed to adjunct appointees exceeded the number of publications of full time academic staff.

4.4   Leadership roles in economic and regional development

Executive and academic staff are frequently called upon to take a leadership role in the formation and implementation of economic and regional development strategies. In Canberra, for example, over the past 12 months senior academic staff have taken lead roles in development of the Australian Capital Territory Education Exports Strategy (Chair) and the Tertiary Education Taskforce which set out a new vision for tertiary education in the Territory.

In the Australian Capital Territory there is a preference on the part of Government for business, community, or tertiary institutions to drive development and innovation agendas. The experience of Government initiated and resourced Innovation Councils in other States have had mixed success in terms of broad participation and achievement.

4.5   Conferences, exhibitions, displays, showcases

Conferences are part and parcel of the academic timetable. It is a challenge, however, to organise and stage conferences and events that involve the active participation of academic staff *and* people from business and government.

Universities have developed a capacity to exhibit and showcase the work of students and staff, particularly in technology, the arts and design. Many support galleries and performing arts centres are directed towards community use and access. This is particularly important in regional communities where a university is a centre for culture and creativity. The University of Canberra, for example, is a partner in the Gallery of Australian Design.

The Gallery Of Australian Design (GAD)
The GAD explores and promotes Australian design through exhibitions, discourse and events and is host to international design exhibitions for Australian audiences.
The Gallery showcases the contribution of design to our national identity, diversity, cultural values, international connections, inventiveness and talent.
GAD is a public gallery established in partnership between the University of Canberra, the Australian Institute of Architects, the Australian Institute of Landscape Architects and the National Museum of Australia. This partnership creates unique opportunities in design learning experiences and research.

5   Organisation based interactions

Knowledge is also transferred between institutions through organisational and managed relationships. These relationships include the wide variety of partnerships, alliances and joint ventures that stand between higher education institutions and businesses tasked with the creation of knowledge for a business or government application. They can be classified in terms of a hierarchy of relationships that moves from a limited legal commitment to one that is fully binding

5.1   Memoranda of Understanding

Memoranda of Understanding are statements of intent and provide a basis for the development of more formal relationships in teaching and research. Their signing provides an occasion to publicise an 'engagement' between two organisations and indicate that they intend to work together. The University of Canberra has used the instrument to initiate interactions, and many have developed into active collaborations and partnerships. An indication of the scope of Memoranda, which build links with business and the NGO sector, in a small university, is indicated in Table 5.

Table 5: University of Canberra – Sample of Memoranda of Understanding Agreed

Other Party	Purpose
Anglicare (Canberra & Goulburn)	To develop a UC Graduate Certificate in Chronic and Complex Care to address the shortage of Registered Nurses in the aged care industry
Aspen Medical Pty Ltd	To collaborate in the areas of teaching, research, and extension projects for the advancement of knowledge and the development of professional expertise
Australian Broadcasting Commission	Student placements, emergency use of UC facilities
Australian Council for Private Education and Training (ACPET)	The general framework of the MOU holds the parties to establish a Management Group to develop Policy and an implementation plan incorporating specific objectives within three months of signing the MOU
Australian National Maritime Museum	To collaborate on research projects for the advancement of knowledge and the development of professional and scholarly expertise and to develop close professional links between the staff and students
Australian Sports Commission and ACT Academy of Sport	Elite Athlete Friendly University Network
Belconnen Arts Centre	Use of Arts Centre, provision of courses, UC student opportunities in paid and volunteer roles, UC staff involvement at the Arts Centre
Calvary Retirement Community Canberra	For teaching, research and extension projects for the advancement of knowledge and the development of professional expertise though student placements and clinics.

Other Party	Purpose
Canberra Urban and Regional Futures (CURF)	To establish a collaborative approach to urban and regional research in the Canberra region.
Centre for Customs and Excise Studies	To create an environment that is conducive to a cooperative relationship between the Institutions.
Centre for Public Management P/L	To develop and expand a framework of cooperation between the Institutions to establish mutually beneficial programs of high quality and effectiveness whilst respectful of each Institution's mission.
Centre for Internet Safety	The Centre was created to foster a safer, more trusted Internet by providing thought leadership and policy advice on the social, legal, political and economic impacts of cybercrime and threats to cybersecurity.
Greater Western Sydney Football Club	To identify collaborative arrangements between the Institutions regarding provision of future athlete and consultancy services. It is also to focus on talent identification and player development programs.
Illawarra Retirement Trust	Collaboration in areas of teaching, research and extension projects for advancement of knowledge and development of professional expertise; Creation of social, recreational, cultural and sporting interactions
Master Builders' Association ACT	To develop a framework of cooperation between the institutions and articulation between their courses with the specific aim of developing a program for delivering courses in and related to Building and Construction Management (BCM) (UC) and Advanced Diploma and Certificate IV Management and Building (MBA-ACT).
National Library of Australia	Student Placements and collaboration in teaching and research.
National Museum of Australia	Collaboration in the conservation of cultural heritage through the development of a program for education and training of students as collection professions especially in the field of the conservation of cultural materials. Student placements.
Public Health Association of Australia (PHAA)	General framework to encourage research

Many of these arrangements have resulted in significant and sustained outcomes in both teaching and research.

5.2   Affiliation Agreements

An Affiliation Agreement is a formal relationship between the University and a third party entity that has been developed to cover situations where the University provides on campus facilities and support.

The University of Canberra has a specific policy of encouraging professional, sporting and recreational organisations, and some businesses to locate on campus where there is a common interest in teaching and research.

Such agreements go further than a MoU and set out formal obligations and commitments in return for reduced rental and waiving of various costs. The University is currently negotiating with two Canberra sporting clubs to locate on campus.

5.3   Joint Venture Agreements

Joint ventures are established by an executable deed and relate to specific outcomes in both teaching and research. The University of Canberra has a number of joint venture agreements with businesses, including a recently signed arrangement with Aspen Medical to provide education in remote industrial health.

Graduate Certificate of Remote Industrial Health (Online)

The Graduate Certificate in Remote Industrial Health (Online) has been developed in partnership with senior clinicians from the University of Canberra (Faculty of Health) and Aspen Medical.

This course aims to provide knowledge and skills that will enable health professionals to autonomously provide a holistic health service to the individuals and organisations located within remote industrial communities.

In this context, the remote industrial environment includes (but is not limited to) mining sites, oil rigs and island resorts. The student cohort is expected to be drawn from people with a nursing, paramedical or medical background. Due to the

Senior executive staff at Aspen have been offered Adjunct appointments.

5.4   Centres for teaching and research

Centres for teaching and research are generally established with university funding and support from business or a government grant. They may also have support from a research funding council. Centres may have substantial autonomy within a university, whilst others have some autonomy in relation to a faculty/school. Some centres fall within departmental organisation but are separately identified for marketing and profiling. There are also small dedicated units consisting of a couple of people and a title on the door (Marginson and Considine 2000).

The key driver in creating centres is to provide a focus for channelling resources, from internal and external sources, for specialised research and teaching purposes:

> When a centre is created it is usually expected to attract outside funding. Normally it is specified, by both government and university management, that the core funding of a new centre is temporary and it is expected to become self-sustaining. Time and time again, these hopes are disappointed. On the whole, the research centres with the best prospects of long-term survival are those able to attract a significant level of postgraduate student load. Research on its own does not earn enough money. Even centres producing saleable Intellectual Property and their significant consultancy work are rarely able to finance all their salaries and overheads from these sources (Marginson and Considine, 2000).

Research centres are important to both the larger and smaller universities. For smaller universities they provide a vehicle for increasing the range of sources of external income to support the research of the university, in particular from non-government and international agencies. Information provided by the Australian Department of Education Science and Training indicates that there are over 300 designated research centres at Australian universities.

There is little research in Australia on the role, function and effectiveness of teaching and research centres. Many universities are looking at research centres in terms of value for money and alignment with mission. Universities are implementing tighter policies regarding the formation, performance, and continuity of research centres.

5.5   Incorporated entities

Incorporated entities range from "big budget" Government subsidised key centres, special research centres and Cooperative Research Centres (CRCs). CRCs have been a particularly successful program for building linkages between universities, government and business in Australia. They have also been important in building research profiles for smaller and regional universities.

The Cooperative Research Centres (CRC) program

The CRC program was established in 1990 to improve the effectiveness of Australia's research effort through bringing together researchers in the public and private sectors with the end users. The program links researchers with industry and government with a focus towards research application. The close interaction between researchers and the end users is the defining characteristic of the Program.

Since the commencement of the Program, there have been twelve CRC selection rounds, resulting in the establishment of 168 CRCs which have operated across the Manufacturing, ICT, Mining & Energy, Agriculture & Rural Based Manufacturing, Environment, and Medical Science & Technology sectors.

Evaluations of the CRC program have consistently pointed to success in building university-business-government relations and knowledge transfer (Australia. Department of Industry Science and Tourism, 1998, Howard Partners, 2003, O'Kane, 2008).

6   Conclusions and implications

Universities have a largely transactional approach to relationships with business, government and the community. This reflects a tradition where universities and academic staff have tended to see themselves as independent agents, with a high degree of autonomy, freedom to pursue curiosity driven research, and with a strong allegiance to an academic discipline. The traditional form of interaction has been one of 'telling' people about the results of research either through publication, teaching or extension work.

In addition to a commitment to missions relating to teaching and research, universities are also businesses. They must be financially viable and sustainable. They must break even and preferably report a bottom line surplus. They have moved a long way from the medieval concept of independence and autonomy driven by the higher order standards of scholarship and benevolent funding. While most universities in Australia are established by statute as public bodies, they are required to meet legislative and regulatory requirements relating to governance, probity, and accountability.

Over the past decade in the Australian policy environment, universities have been encouraged to pursue the 'knowledge transfer through commercialisation' paradigm, but with limited success. A few 'blockbuster' successes now and then keep public policy interest in this mode of knowledge transfer alive. There has also been a tendency to focus attention on the role of Technology Transfer Offices. These offices also have a transaction orientation.

This paper has argued that universities need to build an engagement relationship. More recently universities have been looking towards knowledge transfer through engagement as a strategic driver for building relations with government and business. They are also looking towards creating more permanent, organisationally based, forms of engagement.

Building engagement and organisational interactions however is expensive and time consuming and it is difficult to secure resources for this work from central budgets. Unlike transactional relationships, such as the value of research income secured, engagement relationships are difficult to measure and the results might not be evidenced for some time. Where the engagement function is established as a service role, faculty deans must be convinced of the value that is being created.

So why and how should universities respond to expectations from government, business and the community? Why should government, business and communities respond to expectations from universities?

The first answer is that universities are now part of a global higher education industry. They are in fact businesses, and have an important place in the broader business environment. They are beginning to understand that transactional relationships must be supported by a brand, an image, and a way of working that evokes confidence, trust and commitment to the longer term. With this understanding many universities have become significant players in business and NGO networks – and are seeing success in research collaborations as well as student recruitment activity.

Secondly, universities contribution of research to industry and business development, together with their role in education and building human capital, and the continuing role in securing a civil society, means that a university is a unique institution and has a critical role to play in the economy as well as in the broader community. Universities must be seen as much more than "knowledge vendors".

Thirdly, the vital role universities play in supporting innovation, contributing to national productivity and economic growth occurs in complex ways. It is not a linear relationship, but is dynamic and interactive. While Australian universities do not have a formal mandate for 'third mission' activities, universities are taking on such a role in the form of knowledge transfer to support innovation. Innovation, which is the successful application of new ideas, is sourced from new knowledge created through research as well as new ideas and insights developed by graduating students. The role of

universities in providing an education, as well as training young people to be 'job ready' should not be overlooked in this context.

This paper suggests that cooperation and collaboration between universities, business and government through the paradigm of "knowledge transfer through engagement" should be a major plank in innovation systems thinking and reflected in innovation policies and programs. Policy should reward collaborations that have been developed over time, rather than those that are formed expeditiously and expediently to access a pool of money that has been made available under a 'funding program'.

The paper has also suggested that university, business and government relations become formalised through a hierarchy of interactions, understandings and agreements that take time to develop. It suggests that transactional relationships that take place through markets for knowledge are usually underpinned by relationships formed around social interactions that build trust, commitment and understanding.

Building engagement is an essential task for senior university management. In Australia, universities are making senior executive appointments at the Pro Vice-Chancellor level with specific responsibilities for industry and community engagement. These roles are often combined with responsibilities for innovation – and are separated from responsibilities for teaching and research. The positions demand a sound understanding of business, a capacity to communicate and build confidence internally with academic staff, and to sit comfortably with senior executives in business and in government.

As in business, universities need to understand that the development of effective and fruitful relationships takes time, resources and commitment. Governments can assist by developing performance metrics that focus on strengthening engagement relationships and play down the measures and publicity associated with commercialisation of IP and start-up companies. These measures will be more contextual and focus on instruments for engagement as well as the outcomes. The instruments identified in this Paper go some way to providing this context.

Attachment 1: Companies created by Graduating Students from the University of Canberra

AOK Health

Bradley Wilson studied at UC as a mature age student from 1983 and graduated with a Bachelor of Applied Science in Sports Studies in 1985. For ten years he applied his sports coaching and leadership skills in project management roles involving aerospace, construction and shipbuilding.

In 1994 Bradley started his own company, AOK Health. The company was founded in Newcastle and specialised in the design, manufacture (in Australia) and distribution of rehabilitation and exercise equipment. AOK currently employs 15 staff members and has developed a worldwide reputation for producing the best products. The company currently exports to over 24 different countries around the world covering every continent.

Quick Facts about AOK:

1. Winner of the "2009 Hunter and Central Coast Export Award" which recognises the effort, expertise and resources that AOK Health has contributed to the export industry.
2. Awarded "Trainer of the Year in Transport and Distribution" at the NSW Training Awards hosted annually by the NSW Department of Education and Training (DET).
3. Awarded "1st Place- Fastest 100 Growing Hunter Companies" in 2003.

Website: http://aokhealth.com/

Found Organic

Mark De Luca graduated from UC in 2003 after completing a Double Degree: Bachelor of Applied Economics and Bachelor of Communications with a major in Advertising and Marketing. Mark commenced work at the prestigious advertising agency, M&C Saatchi, as an Account Executive in the Strategic Planning Department. After four years there, Mark and his long-time friend, Onur Kece, launched Found Organic, a juice range which now extends to several types of organic flavours.

It took 18 months and a six-month stint in Turkey to establish supplier relationships and develop the brand and product range. However, Found Organic is now sold in over 750 outlets across Australia. It is also available in the Maldives, Turkey, Singapore and parts of Asia. Positioned as a 'boutique juice', 80% of the company's revenue comes from cafes and speciality grocery chains. Found Organic is the worlds first carbon neutral juice company and the ingredients in the juices are 100% pure, not from concentrate.

The Found Organic recently signed up with distributor, MBC, who have a network of 5000 retail clients across Victoria, SA and WA, which will result in high growth for the company in coming years.

Website: http://foundorganic-carbonneutral.com/

Clear Complexions

Suzie Hoitink completed a Bachelor of Nursing at UC in 1996. After struggling with acne-prone skin throughout her teenage years and finding very little help available, Suzie founded Clear Complexions in 2005. Today, Clear Complexions is one of Canberra most successful businesses with two clinics and 14 staff members. The organisation places great importance of employing skilled, registered nurses to care for its patients.

Website: http://www.clearcomplexions.com.au/

Morrissey Canberra

Trenton Morrissey completed a Bachelor of Information Management with a major in Public Relations in 2001 at UC. He founded Morrissey Property in 2010, a people and sales focused property sales agency. Since its establishment, Morrissey Property has sold over 1300 houses in the Canberra region and leads a strong team of property sales professionals.

Website: http://www.morrisseyproperty.com.au/selling.html

Claudia Borella Glass Design Ltd

Claudia Borella graduated from UC with a Bachelor of Industrial Design in 1993. After a year on exchange at the European Institute of Design in Milan, Claudia completed a Bachelor of Visual Arts with Honours, majoring in glass, at the Canberra School of Art, ANU in 1995.

In 2007, Claudia founded Claudia Borella Glass Design, where she operates regular information and teaching sessions. She has gone on to win a number of awards and accolades including;

- 1997, Kyhoei Fujita Award (Denmark)
- 1998, Gold Medalist of Talente (Munich)

Claudia Borella's work has been featured in LINO , Australia's premier lifestyle and Design Magazine, Australian Glass Today, and Artist's in Glass: Late Twentieth Century Masters in Glass. Claudia has exhibited nationally and internationally, including in the United States, Italy, Switzerland, Hong Kong, and the United Kingdom.

Economic Futures Australia

Steven Brown completed a Bachelor of Commerce in Banking and Finance in 1996 at UC. Since graduating, Steven has had an extended career with the Commonwealth Government in the Department of Industry, working on the delivery, design and policy to encourage innovation in Australia. He then spent five years in the economic development unit of the ACT Government and later completed a Masters in Management (specialising in Technology Commercialisation) at the ANU.

Economic Futures Australia was co-founded by Steven Brown in 2007 in response to a market need. Based in Canberra and Brisbane, the firm works with governments, universities, research organisation and business to increase Australia's innovative capacity and drive the knowledge economy.

Website: http://www.economicfutures.com.au/

Papercut

UC Alumnus, Clair Connelly, graduated in 2002 with a Bachelor of Graphic Design. Clair worked in a design role at Early Childhood Australia, followed by various local design studious and also a stint in the public service. She founded Papercut in late 2007, an affordable, graphic design studio with an environmental conscience. Papercut has seen impressive successes since its establishment. The business has won three environmental awards, three business awards, and has become a hub for young designers to gain experience in the field of design.

In 2010 Claire's hard work and innovative business solutions were rewarded when she was named ACT Business Woman of the Year by the ACT Chamber of Women in Business. Claire received this award for her leadership qualities, tenacity, compassion and for being a role model for fellow businesswomen.

Website: www.papercut.net.au

CRE8TIVE

James Wilson founded CRE8IVE in 1999 after realising there was an opening for a communications agency that specialised in online and the traditional communication mediums. James graduated from UC in . . .

In the agency's short history, CRE8IVE has enjoyed many successes through James's commitment to developing a culture of highly talented and passionate professionals who are proud of the work they produce.

CRE8IVE has won numerous industry and business awards including the Telstra Business of the Year, James was named a NSW Finalist for the Ernst & Young, Young Entrepreneur of the Year Award in 2007 and appeared in the BRW Fast 100 list.

Website: http://www.cre8ive.com.au

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