

Australian Institute for Commercialisation

Review of the National Innovation System Submission to committee reviewing: The range of collaboration models and vehicles for example CRCs

II. Connectivity and Collaboration

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April 2008

DECLARATION OF INTERESTS AND AFFILIATIONS

The Australian Institute for Commercialisation (AIC) is a national, not-for-profit organisation established in 2002 to assist in the commercialisation of Australian research and know-how. Its vision is to enhance Australia's future economic prosperity, environment and lifestyle by improving our national ability to take innovative ideas to market.

The AIC's sole shareholder is the Queensland Minister for Tourism, Regional Development, and Industry. Reporting to an independent Board of directors, the AIC works nationally with Australian industry, research organisations and governments to create high value jobs, exports and wealth by taking innovative ideas to market.

The AIC is chartered to work within the innovation system, and as a predominantly publicly-funded body generally operates in areas of market failure. In 2008, the AIC will deliver services for the Australian, Queensland, South Australian, Victorian and Tasmanian governments. The AIC declares its interest to continue to see strong government support for strengthening the innovation system in order to build a more prosperous future for Australia.

CONNECTIVITY AND COLLABORATION

Vision

“We should all be proud that Australia produces about three per cent of the world’s scientific papers with just 0.3 per cent of the world’s population.

We should be less proud that our total expenditure on research and development as a share of GDP was just 78 per cent of the OECD average in 2004-05.

What these two statistics suggest is that the outstanding work being done by our scientists is not having the impact it should.

This was confirmed recently when Australia was ranked last out of 26 OECD countries for research collaboration between industry and universities, and second last for research collaboration between industry and public research organisations” (Carr, March 2008)¹.

The AIC overwhelmingly supports the Hon. Senator Kim Carr’s comments above and has been active on these same issues since 2004. Australia must do better.

Our vision is that Australia becomes a nation where the value of collaboration and open innovation are widely understood and adopted with much stronger linkages and flows between businesses and researchers.

For just over three years, the AIC has been working in a hands-on capacity at the coal-face, bringing industry and researchers together to increase collaboration between the two sectors through various pilots of its TechFast program. Our hands-on experience in facilitating 45 new collaborations between industry and the public research sector through these intermediary activities has demonstrated the significant potential that exists, were Australia to invest more in developing the ‘soft infrastructure’ required to build collaborative relationships between businesses and publicly funded research organisations.

¹ ‘Science Serving Society’ - The Hon. Senator Kim Carr speech to the National Press Club on 19th March 2008

HOW CAN MORE VALUE BE DERIVED FROM THE INNOVATION SYSTEM?

Priority Areas

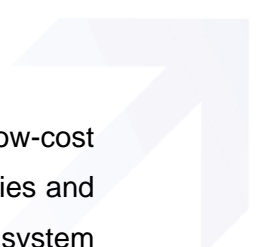

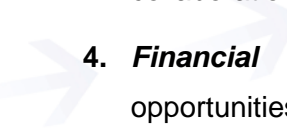
In early 2005 the AIC commenced a pilot program to address **market failure** around collaboration and knowledge transfer between SMEs and public sector research organisations. As a predominantly publicly funded organisation, the AIC is charged with working in areas of market failure; attempting to remedy such failures; and then either exiting or moving to a competitive and commercially sustainable business model once market failure has been addressed.

By acting as an independent intermediary, the AIC's TechFast program has worked with SMEs to assess their innovation needs and objectives (demand-pull) and then where warranted, searched the entire national research sector for technologies, expertise and collaboration partners to assist them. However, the bulk of the AIC's work in TechFast has been to facilitate these businesses and relevant research organisations to successfully work through the significant cultural and commercial issues that can quickly destroy potential collaboration before it begins.

The outcomes achieved from these small but scalable activities have convinced the AIC that much greater investment should be made to improve the innovation system's 'soft infrastructure' or 'dark matter'. In particular, an increase in the activities of independent collaboration intermediaries who specialise in understanding and working between industry and research environments can assist both types of organisations to form productive relationships. Websites and other human-less linkage mechanisms will never succeed in this challenge unless they are actively supported on the ground by a network of people.

Our practical experience has shown the AIC that in order to achieve greater connectivity and collaboration between industry and public research, additional effort must be directed towards a demand-pull approach that addresses the following:

1. **Cultural change** - Increasing the level of awareness, understanding and adoption of open innovation and collaboration practices, particularly within industry.

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2. **Identifying collaboration partners** - Providing a simple and low-cost mechanism to assist industry to understand their innovation opportunities and locate appropriate technology and expertise from within the innovation system to assist them. This is a specialty skill requiring dedicated networks to help identify capability within the sometimes obscure research sector.
 3. **Independent facilitation of collaborative relationships** – Providing a low cost or free intermediary service to independently work alongside businesses and research organisations to ensure real collaborative opportunities are not lost because of the failure to successfully work through the vast range of cultural, organisational, intellectual property and commercial issues in a timely manner. Positive mediation assistance can greatly increase the number of collaboration agreements.
 4. **Financial support** – The process of assessing new collaboration opportunities and partnerships can be time consuming and financially risky for a small business, especially where research has not yet completed the proof of concept stage. TechFast experience has shown that the provision of some limited financial support in this area can increase the ability of business, particularly SMEs, to devote scarce resources to the commercial and technical feasibility exercises to justify the collaborative project.
 5. **Building research capability** – Increased industry collaboration will increase the skills of researchers by involving them in finding solutions to real problems. Importantly, researchers are attracted to working with the best researchers and participating in the most exciting projects where their work is likely to be adopted or implemented. Increasing collaboration with industry will serve to improve research capability in Australia, which will in turn make Australia attractive to the best minds from overseas and stimulate interest in the youth of Australia.
 6. **Mapping research capability nationally** – A vast pool of often untapped talent exists across Australia’s research organisations. There is a need to more formally map expertise across these organisations nationally to better enable industry and researchers to quickly identify expertise of interest.
 7. **Incentives and KPIs to encourage research organisations to engage with SMEs** - Australia’s research capability has been run down through years of underinvestment and additional support needs to be targeted to upgrade capability. However, provision of such funding must be tied to a requirement

for these organisations to improve industry access to such capability and infrastructure, particularly for SMEs who find access far more difficult than larger companies.

- 8. Intermediary Skills Development** – There is a distinct shortage of individuals in Australia who possess the right skill-set to be an effective innovation collaboration intermediary. A mechanism to train such individuals is needed, and one that will help diffuse these skills across industry and academia where the same skill sets are in demand.

THE EVIDENCE

Outcomes Already Achieved

Two TechFast pilots, each of 18 months in length and of limited scope, have been conducted with approximately 65 SMEs from New South Wales, Victoria, South Australia, Tasmania, Western Australia and Queensland participating. Approximately 50 per cent of these were regional businesses. *The AIC has liaised with the Commonwealth government, five state governments and over 50 research organisations* during these pilots and has a unique understanding of the different dynamics, drivers and processes at work within these various organisations. The second pilot program will conclude in June 2008.

To date, *these pilots have directly facilitated 45 new collaboration agreements between SMEs and research organisations across Australia. A further 15 to 20 agreements are currently in negotiation.* Approximately 70 per cent of all SMEs entering TechFast have succeeded in entering into new innovation focused collaboration agreements.

For a Commonwealth investment of approximately \$3.5 million to date, TechFast activities have directly resulted in an additional \$14 million in business R&D activity, with a further several million dollars of industry funded collaborative R&D projects currently being negotiated. One project alone involving a South Australian company and a research organisation will see over **\$4 million of new business R&D being conducted.** A second Brisbane based company has entered into a collaborative project with a research institute to commercialise IP developed by the institute. **The R&D commitment alone by this company is approximately \$3 million, with several million dollars more to be invested if the project reaches**

commercialisation. It is unlikely any of this activity would have taken place without intermediary services to identify and cement the relationships. Commonwealth funding has been critical to this success because the risk to most SMEs was too high, upon their first entry into TechFast and without the benefit of prior experience, to convince the SMEs of the value that they would eventually reap.

Over 400 SMEs have also participated in open innovation and collaboration workshops and SME visits through the program, actively driving awareness and positive culture change surrounding these practices.

Based on the success of these pilots, the AIC has now been engaged by the Malaysian government to assist them to design and implement a similar program, in order to increase their industry and research sector collaboration, BERD and SME export potential. Importantly, this will also increase the immediate reach of Australian industry and research organisations.

Case studies of outcomes from TechFast

Newcastle based Advanced Technology Systems Australia (ATSA) Pty Ltd was assisted by TechFast to access underwater autonomous vehicle IP from the Australian National University (ANU) and develop a collaborative R&D program together to pursue IP commercialisation. The company had no real experience in dealing with research organisations, nor in negotiating IP transfers or collaborations, and this activity was successfully facilitated and concluded by a TechFast intermediary. The resulting ATSA product is now nearing commercial readiness. The company has since also engaged the Commonwealth Scientific and Industrial Research Organisation (CSIRO) to assist with the project.

Melbourne based Fred Bergman Healthcare Ltd was assisted by a TechFast intermediary to identify technologies and capability to assist them to commercialise an adult incontinence nappy for aged care facilities, where smart sensors would alert carers to moisture in the nappy and enable prompt action. The intermediary applied TechFast knowledge of Australian research capability to identify two separate research organisations to assist the organisation with prototype development. A three-way collaboration was successfully developed and the company is preparing to launch this product in mid 2008.

Tasmanian based Fiomarine Industries Pty Ltd was interested to discover if there were more advanced and efficient ways to undertake their product design and testing process. They wanted to develop a next generation of their Fiobuoy technology, a submersible marine marker buoy and retrieval system which is designed to release itself from its underwater mooring either by acoustic command or at a predetermined time, and ascend to the surface to fulfil its marking function. TechFast identified advanced computer design and testing capability at the Victorian Partnership for Advanced Computing (VPAC) which could be used to simulate the prototype design process and eliminate the need for developing and testing various physical prototype iterations, as they had in the past. Fiomarine engaged VPAC and significantly reduced their product development time and cost.

CHALLENGES

While these pilot activities have yielded early success, it is important to highlight that these outcomes were not straight forward to achieve, even with the help of intermediaries. The challenges faced further highlight the need for skilled assistance if Australia is to increase its level of collaboration. Common issues encountered by AIC included:

1. Convincing SMEs that research organisations should be targets for collaboration and that it is not too difficult to engage and work with them.
2. Overcoming a common research organisation perception that SMEs lacked resources and prestige to warrant attention, even when a specific opportunity was identified.
3. *Convincing research organisations to consider the benefits that capable Australian SMEs may bring as commercialisation partners for their research, instead of large Australian or international companies.*
4. Assisting SMEs to articulate their needs in a language that can be interpreted and communicated by commercial office staff and researchers in research organisations.
5. *Convincing SMEs to stay at the negotiation table when the initial negotiation position put forward by research organisations was that the SME would pay for the collaborative R&D, the research organisation would own the resulting*

IP, and the SME would licence it back and would pay a royalty on commercialisation.

6. Encouraging researchers to commit themselves to collaborative industry projects. Researchers are generally not rewarded for collaboration either financially (unless they own some background IP or the IP being created) or through promotion. Such activity is often seen by researchers as an unnecessary burden.
7. Overcoming a researcher's desire to immediately publish results of collaborative R&D where industry has paid and wants to keep the outcomes out of the public domain to protect their competitive advantage.
8. Overcoming tension and mistrust between researchers and their own organisation's commercial or technology transfer office.
9. Managing industry frustration with the bureaucratic process of developing agreements with research organisations. Such negotiations often involve several iterations of draft agreements and it is not unusual for each draft to be lost in the research organisation's legal world for four to six weeks, particularly if IP is involved, thus dragging these processes out for over six months on many occasions.
10. Managing the loss of skilled (AIC) intermediary personnel who were poached by venture capital organisations and research organisations. These organisations appreciated the unique skills sets developed in TechFast intermediaries and saw them as highly valuable. In addressing market failure, TechFast ultimately provided a professional development arena to help address failures elsewhere within the innovation system.

All of the above issues have occurred on numerous occasions during the TechFast pilots. TechFast intermediaries were able to manage these issues successfully because they assisted both sides and brought prior experience and skills.

WHAT SPECIFIC INITIATIVES ARE REQUIRED?

The evidence above has convinced the AIC that although many challenges exist to increasing industry and research sector collaboration, all can be surmounted with specialised assistance. The experience has also provided real tangible evidence of the economic and social outcomes that could be achieved through a larger national

collaboration intermediary network, based on the experience and learning of the TechFast program to date.

The AIC believes this experience provides it with a unique vantage point in understanding where and how Australia needs to act to significantly increase collaboration between industry and public research organisations, and create the desired direct and spill-over effects. *Importantly, this experience and the existing TechFast networks and infrastructure are already in place and generating outcomes. The existing program can be immediately scaled-up.*

The Network

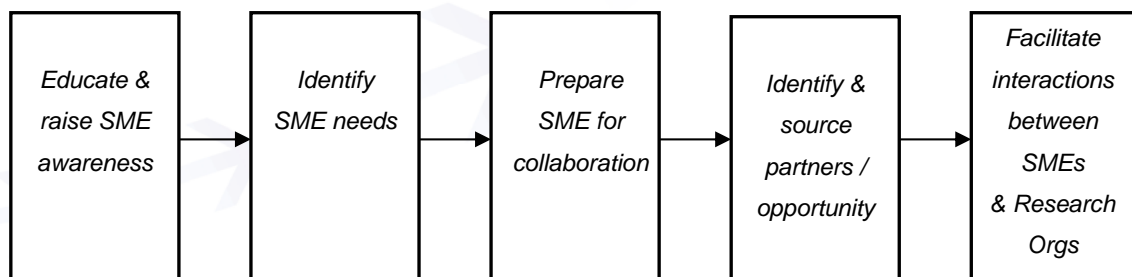
Based on the positive response from businesses as well as tangible outcomes achieved during the TechFast pilot programs, we recommend scaling the existing TechFast network to 20 intermediaries nationally in key regional and metropolitan areas, with an additional five people to coordinate the national linkage activity and act as the capability identification 'search engine'. To maintain a single point of access and to ensure maximum network efficiency and effective internal communication within the group, it is our view that the intermediaries are all employed by and report to a single organisation. The intermediaries would work with local SMEs while also fostering an understanding within the network of the capabilities held by local research organisations and business, so that both local and interstate SMEs can be linked with these organisations. When required, the AIC works through other like-minded international networks, for instance Torino Wireless in Europe, and has found this approach more cost-effective than establishing new networks.

The AIC also recommends that it could take responsibility for training new intermediaries to proactively grow the pool of skills in Australia. This would also help cater to the needs of the venture capital industry and research sector who are also seeking these unique skills. The AIC possesses the experience, training program, tools, IP and training ground to provide such training.

The Services

Under an expanded TechFast, the national intermediary network would provide tailored services in the following six areas:

1. Assistance to SMEs to increase their awareness of the benefits and mechanisms for open innovation and collaboration, actively promoting such concepts through industry seminars as well as one-on-one training where appropriate.
2. A 'one-stop shop' to help SMEs identify capability from across the research sector and other businesses, and to navigate these organisations.
3. Facilitation services to help culturally diverse organisations explore and agree upon collaboration opportunities.



4. Provision of modest funding assistance (matched by the SME) to SMEs that satisfy criterion relating to their absorptive capacity, to help them assess technical and commercial feasibility and pursue collaboration projects.
5. Bench marking and publication of research organisation requirements regarding the best structure, style, language and content of requests from industry for assistance. TechFast experience has shown that industry requests to research organisations not written in a particular way, lacking certain information, or sent to the wrong person, will yield little if any response.
6. *Mapping the knowledge and skills capability within each research organisation and across the sector nationally, including the most appropriate initial contact points in these generally large organisations.* The AIC has already developed a good knowledge of where specific capability lies, and further effort will yield greater connectivity and efficiency from public research investment.

Funding Sources

Based on the success of earlier intermediary pilot programs including TechFast, in 2007 the Commonwealth Intermediary Access Program was established with \$20 million allocated to the program over five years. Although the Commonwealth was

due to issue a request for funding submissions in October 2007, this was postponed during the election caretaker period, and has still not been called. This program offers an appropriate mechanism for funding all the above suggestions. *Failure to not progress with the Intermediary Access Program or an equivalent mechanism would see a loss of the momentum and outcomes currently being generated by the AIC through the IAP pilot program which finishes in June 2008.*

WHY IS IT THE BEST APPROACH?

The AIC's own research and its significant experience in promoting open innovation and facilitating industry and research sector collaboration have convinced it that the following characteristics are vital elements of any initiatives to directly stimulate collaborative activity:

1. **Human interface** – Many web-based portals have been launched over the last decade to facilitate such linkages and seed collaboration. In general none have been very successful. *Facilitating human relationships requires human contact to build trust.*
2. **Independence** – *Connectors or intermediaries need to be independent in order to win the critical trust required to help SMEs connect to the most appropriate research organisations.* They can not be tethered to a commercialisation office or bureaucratic government agencies, nor can they look like 'consultants' with an underlying profit motive.
3. **Demand pull** – Collaboration initiatives must allow market and societal forces to drive the nature of the collaborative activity, as opposed to a more traditional research sector push. Demand pull is the mechanism through which industry can guide the allocation of some of the \$6 billion per annum investment in public research organisation R&D.
4. **Low-cost or free service** – In order to encourage small businesses to readily participate in such initiatives, these services must be least cost at the stage where uncertainty is the highest, and be readily accessible. Developing and implementing open innovation strategies is time consuming and risky for small business as there are no guaranteed rewards. TechFast experience has shown that additional cost barriers to the entry of such programs are a significant deterrent to SMEs.

The above elements are mirrored in many respects in the successful Innovation Advisory Service (IAS) – (www.iasse.co.uk) operating in the United Kingdom, which provides a free, independent, non-bureaucratic, innovation intermediary service to industry. The European Union funded SUPER-SME project² involving a review of seven regional science and technology intermediary programs also supports AIC's recommendations.

COLLABORATION BETWEEN INTERMEDIARIES

Apart from its TechFast program, the AIC is aware of only one other independent innovation-focused intermediary initiative in Australia, i.e. InnovationXChange. Staff from both the AIC and InnovationXChange have been working collaboratively wherever possible over the past 18 months to assist individual businesses and research organisations. Whilst different, the programs are complementary and when cooperating can provide greater network scale and increased linkage opportunities. TechFast specifically addresses the market failure observed in collaboration between SMEs and the publicly funded research sector. TechFast works first to identify knowledge demanded by the market, and then to actively facilitate its sharing, leading to new product or service opportunities for the SME and sustainable ongoing relationships.

It is important that such initiatives are clearly understood in terms of their capability and differences, and that mechanisms for them to collaborate to assist industry when appropriate are pursued. *Collaboration between intermediaries has been restricted by the Pilot Commonwealth Intermediary Access Program that is supporting both initiatives.*

² 'Science and technology intermediary services for SME: A guide via practices', SUPER-SME, March 2008, <http://e-innovation.org/supersme/>

CONCLUSION

This submission has argued that increased collaboration between the research sector and Australian business is important to our future prosperity. It has presented evidence from the AIC's TechFast pilot programs over the past three years, that have – less than one year later – shown a return in private investment of nearly five to one on the Commonwealth's investment. An immediate increase in funding to TechFast would allow a scale-up of this activity, and a commensurate improvement in the culture and innovative capacity of knowledge-based Australian businesses.

APPENDIX 1

AIC capabilities

Since its inception, the AIC has been active as a policy advocate in matters relating to innovation. Such advocacy is not based on academic research; rather, it is based on the AIC's hands-on experience in devising and delivering innovation services and programs. These services and programs are typically delivered on behalf of government agencies. Because the AIC is independent and not for profit, one of the functions that the AIC provides is that of the 'honest broker'.

The AIC's core competencies are:

- extensive innovation networks across Australia, including the research sector
- relationships with the federal and all state governments
- know-how and skills in technology transfer
- experience and track record as an innovation intermediary
- ability to facilitate collaboration across stakeholder sectors
- ability to offer independent innovation policy advice based on its track record of service delivery at the coal-face.

The AIC has pioneered a number of programs that have helped to address failures in the innovation system and that have improved the transfer of knowledge and IP from supplier institutions (such as governments and research organisations) into the user community (typically SMEs).

These programs include:

- ➔ **Commercialisation Bootcamps and Ideas2Market**, professional development programs aimed at researchers and business owners respectively. These programs are designed to assist researchers and business owners to understand the importance of IP, its potential value, and the steps they can take to generate that value.
- ➔ **TechFast**, a market-pull R&D collaboration program that works with SMEs to identify know-how from the research community or other organisations to solve the SMEs business challenges or improve their innovation. Following identification of appropriate IP, the AIC assists these organisations to establish collaborations and to manage the translation and uptake process.

This initiative has been funded through the Commonwealth Intermediary Access Program.

- **Government Innovation Services**, helping government agencies to commercialise IP, typically the ICT underpinning government processes (for instance, in hospitals or management of public housing). This has led more recently to helping simplify the transfer of IP between jurisdictions by introducing a transfer framework and protocol, and managing the information sharing and collaboration process. These services can bring efficiencies to governments and improve the services they deliver by improving their management and use of intellectual assets.
- **Technology Clinics**, roundtables focussed on technological innovation outcomes. The Technology Clinics bring together government stakeholders across agencies and/or jurisdictions, the research sector, and industry partners in order to establish early collaboration in a typical domain area (for instance, energy or health), align research to needs and to better prepare industry for the procurement process that may follow. By enabling collaboration between the three sectors, Technology Clinics provide the vehicle for matching research ability with industry needs and for supporting the development and/or implementation of effective R&D policy.