

INNOVATION LEADERSHIP

FORUM 2007

Innovation & Procurement Policy

Proceedings of the forum in Canberra, 3 October 2007
convened by Terry Cutler & Mark Dodgson

In a past era, government procurement was a major lever for industry development and innovation – one thinks back to offset programmes, and commitments required under industry licensing schemes. The world has moved on. What might be the role of government procurement in industry development today? And what might we learn from the experience of schemes in other countries?

The Canberra roundtable began with a presentation by **David Connell**. David was the Chief Executive of TTP Ventures, a Cambridge based venture capital fund specialising in early stage science and technology based ventures. He is also associated with the Centre for Business Research at the University of Cambridge. In the UK David has been campaigning for the introduction of a US style Small Business Innovation Research (SBIR) programme and his recent report on this subject has had a major influence on UK policy thinking¹. The authoritative report on Innovation in the UK by Lord Sainsbury², which was released just weeks after this Canberra forum, strongly recommended the adoption of such a scheme.

David Connell's presentation was followed by panel discussion around a variety of Australian perspectives on procurement policy. The panel members were:

Bob Herbert

Chairman, Innovation Xchange and former CEO, Australian Industry Group

Jon Stanford

Partner Deloitte and Insight Economics

Randall Straw

Executive Director, Multimedia Victoria

Frank Wyatt

Managing Director of Enterprising Partnerships Pty Ltd and Board of the Australian Business Foundation

David's presentation fell into two parts. In the first part of his presentation he explained the development challenges facing the growth of new science and technology companies, and the disadvantages UK firms suffered compared to their US counterparts. In particular, and this expanded upon some of the myth-busting about commercialisation which featured at our 2006 Summit, David argued that we have been too narrow in our thinking about the origins of technology innovation and tend to ignore what he terms 'soft companies' built around customer contracts and solving real world customer problems. David then outlined the operation of the US Small Business Innovation Research (SBIR) programme, and the competitive advantage it, and related procurement policies, give to US firms.

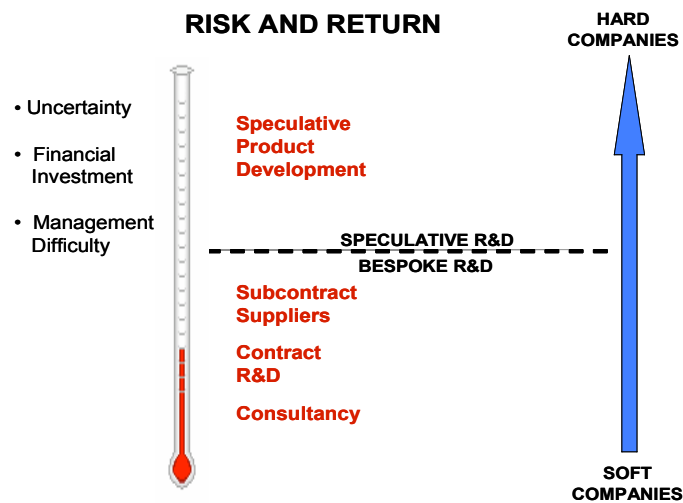
¹ David Connell, "Secrets" of the World's Largest Seed Capital Fund: How the United States Government Uses its Small Business Innovation Research (SBIR) Programme and Procurement Budgets to Support Small Technology Firms, Centre for Business Research, University of Cambridge, July 2006. (www.cbr.cam.ac.uk).

² Lord Sainsbury, *The race to the top: A review of Government's science and innovation policies*, London, October 2007

USING GOVERNMENT PROCUREMENT TO HELP GROW NEW SCIENCE AND TECHNOLOGY COMPANIES; LESSONS FROM THE US SMALL BUSINESS INNOVATION RESEARCH PROGRAMME

'Soft' and 'Hard' Companies

First of all I want to talk about the idea of soft and hard companies. This is a particular way of looking at the business models that technology companies can adopt when they start out. When an entrepreneur or a group of entrepreneurs start a technology business there are a whole range of strategies open to them, with different levels of risk and return. Risk in this context has three components. First there is all the uncertainty: can you make the technology work? Is there a market? Will competitors get there first? Secondly, how much is the technology going to cost, and what's the investment going to be? Thirdly, how difficult is it going to be to manage the business as it progresses?



Source: © David Connell, 2007

At the bottom of this exhibit, there are consulting businesses. Lots of technologists and scientists find they can start some kind of consulting business; a business card and a telephone number and you are away. A bit more difficult but more expensive to start is contract research and development. This is where you develop technology for individual customers. It is very easy to start a business of that kind in areas like software but you can also do it in other areas as well, often with relatively little capital investment. A bit further up the spectrum is where you are actually developing and supplying volumes of product. Right at the top you've got speculative product development. This last option is your classic business school model. You have your bright idea, you write your business plan, you raise your money, you develop your product and eventually you sell it to a grateful group of customers.

Down at the bottom are the soft companies; up at the top are the hard companies. The reason the word soft and hard are used is because, at the bottom end of the spectrum, your strategy is very malleable. Essentially your business is skills based. You are probably selling off a PowerPoint presentation, a little technical demonstrator or something of that kind. If the customer doesn't like this you can sell him that. So soft companies are very flexible in their approach to customers. In the world of the hard company, once you have defined your product and focussed on developing it, then if you get it wrong there is probably not going to be a second chance.

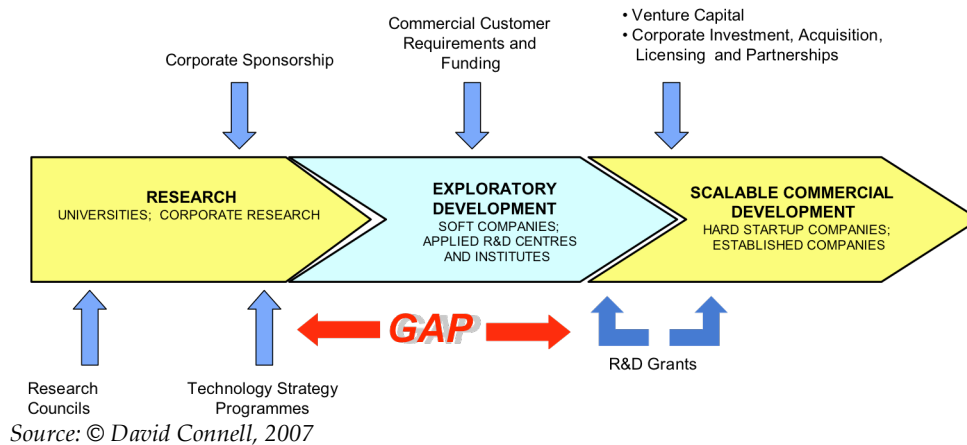
The dividing line basically depends on who pays for the R&D. At the bottom it's the customer; at the top it's the company or to be more precise, the investor.

Hard start-ups typically require significant amounts of venture capital to get going but they can, if successful, bring very large returns to investors because such businesses tend to be scaleable. Soft start-ups rely much more on customer contracts to fund development and they are actually not terribly attractive to venture capitalists because the rate at which you can grow such a business is typically the speed with which you can recruit people, which is probably at a rate of 30% or 35% per year at best. The soft model actually turns out to be very important in the exploratory stages of exploiting new technologies, particularly platform technologies.

David Connell explained the soft company example of the TTP Group, originally called the Technology Partnership. It has a sister company in Melbourne, Australia. This is Invetech, now part of Vision Systems, founded by Jim Fox. Both the companies had a common origin in PA Technology in the 1980s (and the Invetech management buy out invested in the management walk out in Cambridge which established TTP). In the UK TTP is a series of contract R&D businesses involving IT, drug discovery technology, printing technology, diagnostic technology, a whole range of different contract activities based around engineering physics in the main. Over a period of time TTP has built a whole series of businesses employing altogether about 1,000 people. David Connell pointed out that soft companies are also very good at incubating hard companies. He cited the example of Cambridge Silicon Radio, now the dominant player in the Bluetooth chip market worldwide, which spun out of Cambridge Consultants, a TTP lookalike. David attributed much of the success of this "hard" spin out to the execution skills honed within the host 'soft' company³.

Role of Contracts in the Commercialisation of New Science and Technology

Innovation is about problem solving; customers have problems and they have 'wish lists'. A development contract from a customer is the best market research a technology company can have. So let me now turn to the role of contracts in the commercialisation process of new starts and technology commercialisation. The way I like to look at this is using this little diagram here.



There's a series of research activities which typically go on in universities or maybe very large corporate labs which are genuine research. And there's the activity which businesses are good at doing, particularly if you like venture capital backed businesses, businesses that are very well managed and so on and a hard start up business where you have a scaleable business model. There is, however, a lot of stuff in the middle which is much more

³ "I would argue they were able to build a business of this kind in a way which was executed so well - and chip companies are all about execution in my view - because the group of people had worked together within Cambridge Consultants, this soft company, doing a whole range of different contracts, for different customers, for about 10 years. So they honed their skills, they built a technical team, and they built a management team. A lot of the work was in CMOS wireless technology for companies like Ericsson, so they were virtually there when the Bluetooth standard emerged and they were in a position to put their foot on the gas".

exploratory and this is particularly the case where you have a technology emerging from an academic laboratory which is probably going to be a platform technology. It is made from a particular kind of software algorithm with different applications, maybe a bit of material processing technology. There may be multiple applications but you really do not know at that time whether any of them are going to be commercially viable compared with the competition. So this is an exploratory process, but one which has to be undertaken in a business environment. Universities can't do this. One academic with quite a few spin offs to his name was saying to me just the other day that the trouble is that in universities you cannot do anything. What he meant is once you start engaging with customers, they are interested in deadlines, you need a team of engineers to start providing demonstrators and your colleagues want to do something different. But if universities cannot provide a helpful setting, on the other hand you have not got a proposition which will be attractive enough to investors. All you can say is we have got some interesting technology, and we think it will be worth something some where. No investor is going to buy that, by and large. But in this part of the process it is really this soft company exploratory process which, to my mind, is the key way forward. Put simply, I think innovation is very simple, it's all about problems - problem solving. Actually the best innovators are generally your academics because they invent their own problems, but for most of us it is about speaking to the customers, finding out what their problems are, finding out what their wish lists are and trying to apply our skills and our technology to those challenges. The best market research you can have is a contract from a customer who says "I like that idea and I'm prepared to pay you to develop it for me". Money changing hands through such contracts is an important part of the commercialisation process as it concentrates the minds of both parties and ensures that problems (and constraints) are well defined and understood, and that any technology developed is properly tested.

If you look at technology success stories, certainly in the UK and elsewhere, actually many, probably most, owe a large part of their success to this soft company model. In the US both Intel and Qualcomm are good examples. Intel's family of processor chips which is the main bit of the business was initially first won and then carried out as a paid contract for a Japanese calculator company. It was another ten years before Intel realised that this would be the bulk of their business. Qualcomm dominates the technology for mobile phones and, again, contracts, especially government contracts, were an important part of its early history

So certainly in the UK, and I believe worldwide, this soft model is really important. I think the reason it is not understood is because the hard company model, the model of Silicon Valley venture capitalism, is much more glamorous. People like to talk about it much more. But actually the more you dig the more you find that this soft model is important. Within Cambridge, which I can talk about best, soft companies are actually more important than the University as a direct source of spin out companies. There are not that many really successful spin out companies from Cambridge University; if you get a couple a year you're doing really well. Soft companies have provided a really important initial training ground for entrepreneurs and venture capitalists, many of which have started through this route and gone on to do other things. I would argue they provide a really useful stepping stone for academic scientists as they take that step into the commercial world. They learn project management skills, little bit of marketing and so on.

So the conclusion I would draw is that if government wants to support technology exploitation and have a vibrant innovation policy it's very important that it supports these soft companies and, in particular, it can do so by placing R&D contracts with those companies to solve its own, that is to say, government problems and government issues. Government is roughly half the economy in the UK and there is an important role that it can play if it chooses to do so. I am sure the same applies in Australia.

Key issues for smaller advanced economies.

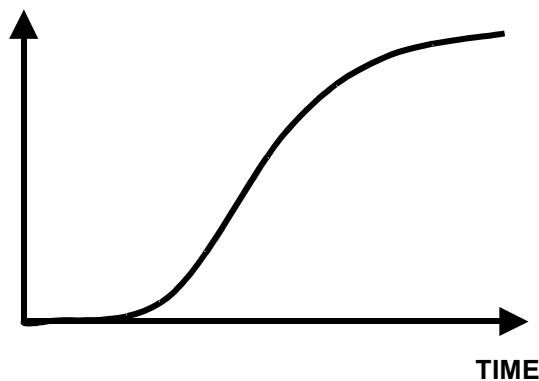
Now I think there are some special issues for smaller economies and I would include the UK and Australia within that group. I start by looking at venture capital returns in the UK. We have a strong VC industry in the UK, the strongest outside the States. If you look at the returns you will see that early stage technology is the worst place you can possibly be in terms of delivering return for your investments. This is a consistent story over many, many years. Now, this isn't to say that there isn't a big dispersion around the aggregate returns nor that there are not well performing funds. This, nevertheless, does not matter because the institutions that invest in venture capital, the so-called funds of funds, are now very internationalised businesses. They can decide whether to invest in a VC fund in the UK or a buy-out fund in the US or a resources fund in China. It is a global business and the result of this is that there are very, very few investors that are interested in investing in venture capital funds in the UK, or in Europe. This is because they look at the average returns in making asset allocations. This is a completely sensible and rational decision.

I draw a second conclusion from this and that is that if we want to build a viable UK technology venture capital industry then we have to redraw the dividing line between public and private finance. Again I suspect the same issues apply in Australia.

In today's world, capital and management is pretty mobile, and there is evidence to show that UK entrepreneurs can build very big companies in the US. Equally, the evidence suggests that US entrepreneurs coming to the UK have exactly the same problems as local companies. The reality is that we have built few if any gorillas in the UK. So we haven't had the home runs which is what VC returns depend on. The question is, why?

And then I turn to this model.

MARKET SIZE



SOURCE OF COMPETITIVENESS

Innovation → **Scale** → **Cost**

When you are creating a hard company, a company with standard product and potentially big volumes, what you find is that the source of competitive advantage changes very rapidly as that market grows. Right at the start it's all about innovation, it's about being clever, but it rapidly becomes being about scale and ultimately about cost. If you take a UK and a US company starting at roughly the same time, after five years the US company will typically be five times the size of the UK company and would have five times as much to spend on marketing, on R&D and on acquisitions. This is because the US market is so much more scaleable, so much more homogenous. Whilst the internet, the growth in importance of Asian OEMs and declining travel costs have offset this advantage to some extent, the ability to scale

a company quickly is usually still very different. There is almost an inevitability that UK companies will get out-competed and gobbled up.

Reducing the time taken to secure first sales and thus get on the growth ramp is therefore especially important for non-US companies. Critical success factors are:

- time to first customer feasibility study,
- time to first customer trial, and
- time to first customer deployment,

As a customer, it is always easier to be a follower. When a new company is trying to sell in the States one of the first questions it is likely to be asked is “can you show me a reference site”? So government has an absolutely crucial role to play in being prepared to be a first customer. It should be encouraged to do that through customer trials and through early research and development contracts.

SBIR and US Government Procurement Policies

It turns out that the US does this rather really well, and has done so for a long, long time. The key role of the US Federal Government in the national R&D system is generally well understood. It has been pivotal in the development of the semi-conductor sector, the computer sector and lots of other areas. Expenditure is very large, and a substantial part of it is with industrial companies. Within the blood stream of government is the understanding that small companies have a pivotal role to play in innovation. The US Small Business Administration tells us that they generate thirteen to fourteen times as many patents as large companies, and that they generate 60 to 80% of the new jobs.

A lead programme in the US is the Small Business Innovation Research programme (SBIR). It was initially established in 1982 under legislation signed by Ronald Reagan. The law defines the amount of money that has to be set aside for this programme, which is 2.5% of all larger agencies’ external R&D budgets. It used to be much less; the percentage has gradually increased over the years. The key features of the SBIR scheme are as follows:

- Aimed at meeting Agency’s requirements for new technologies as customers: usually specified in some detail, typically in terms of functional wish lists
- Available to US businesses owned 51% or more by US citizens
- R&D contracts (plus some “grants” for directed research). 100% funding is the norm. No collaboration is required. Companies retain and own IP.
- Competitive process run by each agency 2 to 4 times a year. Agencies required to ensure ‘simplified, standardised and timely solicitations’
- Complete transparency of topics, award winners and amounts

The scheme provides 100% funding, with a 6% allowance for profits.

The important thing, which people outside the US often are not aware of is that essentially this is not a ‘set aside’ target, but a seed fund. It takes a pot of money, defined as 2.5% of the larger agencies external R&D budgets, and runs it through a very well designed and managed competitive, seed funding process.

Different agencies operate slightly differently, but there is a standard model which is based on a phased funding approach. A successful company will first of all get a Phase 1 project contract. That’s typically \$100,000 to do a feasibility study, maybe funding six months work.

Roughly around one in seven companies that apply are successful. A half of Phase 1 winners go on to win Phase 2 contracts. These are for a two year development programme, typically \$750,000 dollars per contract.

There is a third phase that is not actually funded from this total \$2 billion dollar budget. The third phase is funded from normal budgets, either for further R&D or normal public sector purchasing of the final product. If a firm gets Phase 3 status for an SBIR funded project, there is an expectation that for any technology or product based on this SBIR funding that is purchased by any government department in the future, that firm will be sole supplier. In fact, if it is not sole supplier, the agency has to notify the SBA. So these are really valuable benefits.

The scheme delivers about 4,000 contracts a year to about 1500 firms. Lots of companies win multiple contracts. Most of them go to the smaller end of the scale: 70% to companies employing less than 25 people, and 50% to companies employing less than 10. In the Defence area there are also a lot of companies in any one year that are new to DOD contracting. The DOD regards this as being a way for companies to get on the first step of the procurement ladder. Because firms can receive multiple contracts in parallel there has been some criticism of what are called SBIR mills. These are firms, mainly in the Defence arena, that have made a living out of doing research. I should add that when agencies are assessing firms bidding for these contracts explicit attention is paid to the prospect of dual use, for example commercial uses as well as military uses, and this figures quite significantly in the decision making.

David Connell outlined numerous examples of successful companies for which the SBIR programme had been their springboard. He also provided some examples of UK companies which had migrated to the US to be able to take advantage of the programme.

What about the economic impact? A whole series of different analyses have been done of the impact of the SBIR. I think, to be honest, like so many of these kinds of things you have to question whether some of the authors are completely impartial. But actually the reviews have all been pretty positive. There have been a number of very good reviews by US government bodies. One issue sometimes mentioned is the existence of the SBIR mills mentioned earlier and the 11% of SBIR funding going to a very small number of these kinds of firms. The conclusion analysts have drawn is that this is either not a real negative, because they are doing good research for the government. Certainly, if it is seen by some as an unfortunate bi-product of the programme, it is not regarded as serious enough to jeopardise the value of the overall SBIR process.

The most systematic academic study of SBIR was in 1999, by Joshua Learner at Harvard Business School. He compared 500 companies that had received SBIR contracts with 900 matched companies which hadn't and concluded that the SBIR firms had created 5 times as many jobs over a 10 year period. In regions with high levels of entrepreneurial activities, such as Silicon Valley and Boston, the difference was 17 times. This really highlights the value of the programme in fuelling economic growth. An analysis of companies receiving National Science Foundation contracts tells a similar story.

The SBIR programme is just one part of the procurement picture in the US. As well as the SBIR, which is worth about \$2 billion dollars a year, there is a very similar program, but much smaller programme called the Small Business Technology Transfer Research Programme. This is virtually identical except firms are required to have a university partner, with between 30 and 70% of the funding going to the university. (Collaboration to a lesser degree with universities is allowed under SBIR as well, but it is not a requirement).

There are significant R&D procurements from non-SBIR budgets. I mentioned SBIR Phase 3, which is funded outside the \$2 billion, and is probably worth about another \$2 billion dollars. Beyond that there's also participation in what I call 'broad area announcements' to solicit proposals from industry. This is open to large businesses as well as small. Small businesses can compete directly but they're more likely to win in most cases if they're part of a

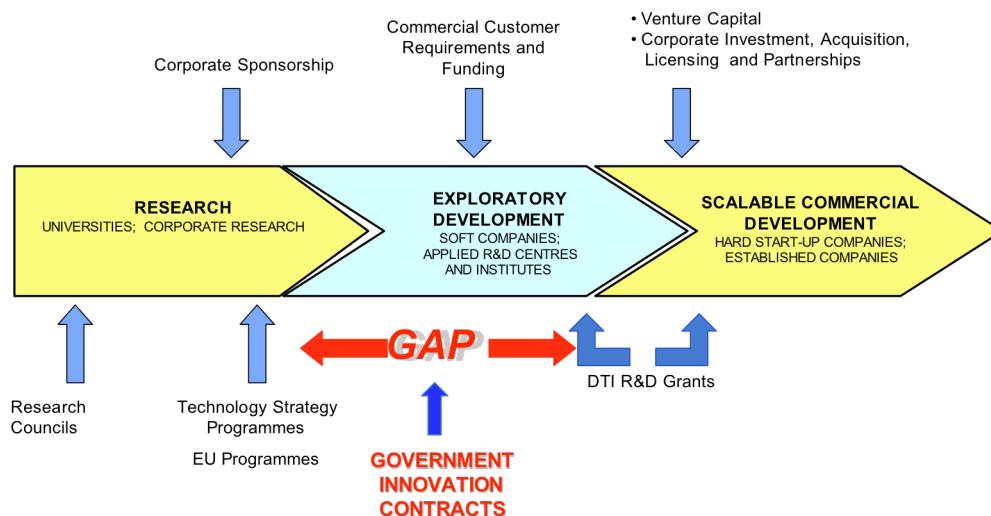
consortium. So there's probably significant R&D procurement funding going to small business through this mechanism as well. So the total US R&D funding going into small firms from federal procurement budgets is probably about \$8 billion dollars per annum, at a very rough estimate. There are published statistics showing that 13% of all Federal R&D contracts by value in 2003 went to small firms.

When we look at mainstream procurement (i.e. not just R&D, but everything from stationery to jet fighters), there is a further set of significant legislation favouring small US firms. These define minimum set aside targets for *direct* procurement expenditure and also require *prime contractors* to maximise the proportion they subcontract to small firms. Under the direct federal set aside rules about 25% of total Federal Government procurement expenditure currently goes to small businesses, whilst a further 20% is channelled to small firms via the subcontracting arrangements. Both are very carefully monitored. So essentially 45% of US Federal Government procurement is earmarked for small businesses. These beneficiaries are small US businesses, so this is obviously a key barrier to the rest of us.

There are some interesting mechanisms for ensuring that the SBIR programme links up with this broader procurement process. Prime contractors are required to include small business sub-contracting plans when they bid for contracts. These are monitored every year (you can find the numbers if you dig around in the internet or annual reports). So to help meet their targets the large firms tend to have "small business officers" and some of the largest firms in defence have SBIR officers whose job it is to identify small technology companies funded by SBIR programmes. The DOD runs showcase events to try and bring small companies and big firms together.

Overall then, the SBIR programme has a hugely important role in the funding of early stage US science and technology companies. It is probably more important than venture capital for these companies. Some preliminary estimates indicate that through SBIR and other federal R&D programmes, small firms in the US are getting an order of magnitude more State funding than their counterparts in the UK.

There has been frequent mention over many, many years of 'the equity gap' in the UK. Personally, when it comes to science and technology companies, I don't think there's an equity gap at all. What I *DO* believe is that for perfectly rational reasons, informed private sector investors are unwilling to put money into early stage technology based firms with long term potential. So there is an important funding gap, particularly for the key "exploratory stage" of development which new technologies need to go through before key applications are developed and a scaleable business can begin to be constructed.



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This stage must take place in a business (rather than, say an academic) environment. But it is not suitable for normal VC backing, so it is not really an equity gap. If Government does encourage venture capital firms to play the prime role in funding this stage, which I'm afraid is what successive UK governments have done, it will just help ensure that fund managers don't make good enough returns to attract further investment.

This funding gap is filled to some extent by private sector contracts, but public sector contracts also have a key role to play. This is where US innovation policies are so much more effective than most other countries.

It is for these reasons that I have, alongside the then MP for Cambridge, been leading since 2004 a campaign in the UK to persuade the UK government to establish a US style SBIR programme.

Over lunch David Connell provided a frank overview of the UK campaign for a SBIR scheme. Following the forum, the UK Government released Lord Sainsbury's report which strongly supported such an initiative.

The Panel Discussion

The panel session was moderated by Gerhard Vorster, Managing Partner of Deloitte Consulting. The panel members were:

Bob Herbert

Chairman, Innovation Xchange and former CEO, Australian Industry Group

Jon Stanford

Partner Deloitte and Insight Economics

Randall Straw

Executive Director, Multimedia Victoria

Frank Wyatt

Managing Director of Enterprising Partnerships Pty Ltd and Board, of the Australian Business Foundation

Gerhard Vorster

This session is going to focus on government procurement. It's going to focus on the two roles that government could have: that of an operator and that of a shaper. I think the role of the shaper is more important here, and we would like to get some thoughts from some of our other guests as well. The two questions that were posed to them are: How might an SBIR scheme work in Australia? and then, secondly, how could government contracting regimes better support local industries?

Bob Herbert

What an enlightened programme the SBIR is! I have had the advantage, I guess, of Chairing the National Manufacturing Forum which was to bring together on behalf of all the State and Territory governments a set of strategic actions to boost Australian industry. As you'd expect we looked at the issue of procurement policy, as well as innovation and all the elements which lie behind the SBIR programme. The Forum Members were drawn from industry, drawn from the Unions, drawn from all the State governments and it came forward with the unanimous view that in terms of our procurement policy we've been very much on the back foot. It's been a negative approach, or a passive approach at best.

When you talk to governments about being more active in this area you are likely to be quoted WTO rules and all the reasons why it can't be done. The insinuation is made that you're taking a protectionist stance or, worse, trying to back winners. These are the sorts of reactions you confront when you want a more proactive government intervention in purchasing policy. The common view amongst the National Manufacturing Forum members was that we have to take very concrete steps to change the psyche from "why Australian?" to "why not Australian?" I think that means we have to be more active, more aggressive, in using publicly funded purchasing power to achieve economic development outcomes. I totally believe this SBIR programme fits into a programme or an initiative which could be well adapted to Australia. We have to marry together the two principles of community benefit from competitive purchasing on the one hand and the economic benefit to the community from local sourcing on the other. There was an unanimous view amongst the National Manufacturing Forum members that there is a very positive impact on private sector investment and employment should you follow programmes which are more aggressive in this regard.

But what's the starting point? Where are we at now with purchasing policy in Australia? Sure, we've got to have some consistency across all the States. The programmes have to be visible and they have to be adhered to across all layers of government, not just the Commonwealth or the State level but also into Local government and government agencies. Government should, in particular, carry an onus for implementation, not just give lip service

to the policies but carry an onus, just like companies do with the requirements of corporate governance and how that has to be monitored by audit compliance and risk committees and then publicly reported in Annual Reports. Policies should maximise the opportunities for local companies to compete on the basis of value for money, but the cost elements of that have to be measured over the whole life cycle, taking into account all the elements of the purchase that's being made, and proper costing measures have to be put into place for that. You can also enhance the way government goes about its tender process to actively encourage responses from Australian enterprises and, of course, you should not, in this process, ignore the issues of quality, capability, or cost competitiveness. These should not be compromised.

With that starting point the question is whether we can embellish this, and take it a step further. What are the opportunities for Innovation in government procurement policy? There are dozens of examples, but let me just talk about a couple. Firstly, there are those areas which are of strategic importance to Australia, and I pick out a couple of industry sectors here: the Defence Sector and the Automotive Industry. Under any measure you could argue both of these sectors are of strategic importance to this country. There are initiatives now being taken by the government in the area of the automotive industry. They have introduced, for example, the Team Australia Automotive Initiative which is placing automotive representatives into Detroit so that they can identify opportunities for component suppliers, and some opportunities are arising from this. Then the Opposition's proposal for its green car initiative is also strategically important, because we all know of the pressures on the auto industry and the impact on component suppliers. If you think ten years ahead hybrids will be common place, so we must start developing initiatives through government policies that encourage the major companies to go down this route, otherwise we will lose the car industry and the component supply sector altogether.

We can look too at the Strike Fighter contracts in the Defence area. I know some of the contracts have been recently awarded to smallish SME's in Melbourne and in New South Wales. Is there a case for trying to bring the experience and expertise of those companies, small as they may be, together into some form of centre for excellence so that some of the duplication in tendering costs and the like can be avoided?

The other area is that of government services and infrastructure and I hone in here on a couple of areas of particular interest to me -- the rail sector and water desalination. In the Rail sector we spend \$16 billion dollars or thereabouts each year around Australia by State governments and the Commonwealth. But are we getting a bang for our buck out of this expenditure? The system is fragmented as you know, and we're not applying the opportunities that can flow from that expenditure to grow our SME's doing signalling work, or safer rail crossings, or improving the wheel/ track interface or whatever the technologies might flow if we were working better together to maximise the benefits from that amount of expenditure. With more targeted programmes we could have a big influence in that sector for Australia, especially to satisfy our growing dependence on freight in such a vast country.

This also raises the issue of the role for the ACCC. Recently a PPP contract was let to a major supplier of rolling stock in New South Wales. As a consequence of the letting of that contract 90% of the order will be satisfied from overseas. The other competitive bidder that didn't win the contract will probably say, well, what's the future for me here in making rolling stock locally. So we're likely to lose that sector as a consequence of not being able to bring together the competitive forces of two major rail rolling stock manufacturers into one that can compete globally. We just worry about the need for competition within Australia when the focus should be on building heft so we are competitive globally. So the ACCC approach is one that should be addressed.

Last night when I got home in my mail was this lovely brochure from my Local Member of Parliament telling me about how the government was going to secure Victoria's water future. It outlined \$4.9 billion dollars which will be spent over the next five years in major water

infrastructure projects to boost Victoria's water supplies, including the largest desalination plant in Australia. This will add to the desalination plants in South Queensland, in New South Wales, in South Australia, and there's a couple in Western Australia. So just imagine the dollars in the pipeline for expenditure in the area of just desalination and water treatment and the like. When I read the brochure, there was not one word about how this great expenditure might be turned to the advantage of Australian companies. This is a gap in our thinking. There's a likelihood that the companies, or the governments, will look overseas for the technology, bring it here and put no useful input into developing a local technology capability within this country. That to me is a great area for concern. So if you look at government services in rail, in desalination, if you talk about strategic sectors there are huge opportunities for programmes like those that have been outlined today.

There are some tools that are in place now that we can use and adapt for a programme like this SBIR programme. I declare a vested interest in the Industry Capability Network and the InnovationXchange. I'm involved on the Board of both. The Industry Capability Network is an organisation with a database of 40,000 companies detailing the capability of those companies. Now could we link the work of this Network into an SBIR programme? Perhaps we could. Could the Innovation Exchange be required, as part of a SBIR programme, to work with universities when opportunities are seen for collaboration between companies and research organisations. Finally, both the Government and the Opposition are supporting productivity performance centres around Australia. Surely there's a role for a SBIR programme linked into those productivity performance centres.

SBIR seems to have great merit and we should look at it closely in the Australian context.

John Stamford:

As an ex-bureaucrat finishing up at the Department of Prime Minister and Cabinet my instant reaction to David Connell's presentation on the SBIR scheme was how could a similar programme work here. Currently we don't really do innovation well in government. The policy function is really not focussed. Innovation and industry are currently housed mainly in three different agencies - DITA, DEST and DoCITA - and there's very little coordination across them in terms of innovation policy. Bureaucrats are very, very nervous of picking winners. In the government purchasing area there are no prizes for innovation; it really is safety first. So it's really a matter of a government coming in and focusing the innovation policy function which is currently what Labor is talking of in government and, secondly, seeking to change the whole mindset because, honestly, government does pick winners. It always has and we can identify a couple of areas easily.

One example is R&D grants. Here government has always needed to assess different proposals. You can set up independent panels of experts to actually select the companies and the projects, but those are clearly picking winners or backing projects and in that sense there's just no 'in principle' difference with the programme that David Connell outlined.

In addition there is currently a programme called the strategic investment coordination programme. Almost all of those grants, which would add up now to almost a billion dollars, have gone to huge projects in the resources sector. Now if in Australia we can't undertake major projects in that sector without large government handouts then there has to be something wrong. It's in the area of innovation and small innovative firms where we do really have problems. So maybe a radical rethinking of policy in favour of innovation would help.

A point to note is that the US is different in that it has a large number of large size innovative firms that the little companies can partner with, and obviously clusters of innovative firms form in New England and California. We're probably more like Omaha or Nebraska, I think, relative to that sort of corporate infrastructure. How do we actually change that? Well it's difficult but I come back to the investment attraction theme and we really should be seeking

companies that fill gaps in our value chain, higher up that innovation chain, rather than trying to bring in, say, someone to just operate some fairly simple large plants on the north west shelf. So there are two areas of policy focus involved: innovation and how to actually do it from government and, then, secondly, looking seriously at investment attraction policies.

The next area to look at is Defence. It was obvious that much of that SBIR funding in the US comes from Defence. Now that is a very, very different business in the US than here. They are at the technological forefront and only purchase kit from the US. Almost all of our kit comes from overseas, and the risks that Defence takes are probably the wrong kind of risks. They just love to take a French platform and fill it up with US electronics and Japanese something else and British missiles, for example, and it often doesn't work or it takes say a decade to actually make it work. They take risks with Australian companies very, very rarely. As an example, look at CEA Technologies, a company in Fyshwick, which developed one of the world's best naval radar systems. It caused not a ripple of interest at Russell. They did finally sell it to the US - and I think it was helped by the US firm Raytheon - and it was only when the US actually used it that our Defence people got interested. That is no way to actually promote innovation here at all.

Randall Straw

As the Executive Director of Multimedia Victoria, I look after ICT policy and programmes for the State of Victoria. Personally I am a strong believer in using government procurement as a policy lever to achieve other policies objectives. Apart from the Holy Grail of value for money, that's banged into everyone by the Treasury and Finance Departments, I think procurement can be used for something broader. I don't believe this has been very fashionable over the last ten to twenty years in government. Today, however, I want to give you three examples of what we've done in Victoria around innovative procurement in trying to pursue multiple policy objectives, and the rationale for this. What our experience in Victoria shows is that the sky doesn't fall in when you do it.

The first example is in the area of intellectual property. The Victorian Government spends about \$1 billion on IT each year. For years, every time we had software developed by a company, the IP became owned by government. What does government do with it? It locks it up, and seldom exploits it. As a result companies have little incentive to innovate very much when they develop things for you. So Victoria has changed the default position. Every time a contractor develops software for the Victorian Government the default position is that the contractor will own the intellectual property. Was it hard to get this change? Yes, because culturally Chief Information Officers have believed for decades that you need to own things to control things. We showed them that wasn't necessary. We don't have national security issues so we don't need to necessarily own the software. We can actually have it licensed to us and have all the capabilities as if we did own it. What we think this will do is that companies will actually develop more innovative products and that they will actually develop them in a more modular fashion with reuse in mind so they can exploit it and sell it overseas using the government as a reference site. This is very important for them in winning export success.

The second example is in telecommunications. The Victorian Government is the biggest telecommunications buyer in Victoria. What did we do? We aggregated our buy and we split up our tender process to support outcomes in other priority areas. What outcome did we want? We wanted a competitive infrastructure in regional Victoria and to have facilities-based competition in broadband. So we actually structured our tenders so that, apart from saving a couple of hundred million dollars, which we did, we also got \$200 million of new infrastructure to compete against the incumbent in Victoria. We thought that was pretty innovative, and a lot of sub-national jurisdictions have done exactly the same thing.

The third example is in the structuring of contracts involving small business. Small business constantly complains about the difficulty of doing business with government and gaining

government contracts. One of the problems is the way we structure our tenders and go to the market. They normally don't have much chance of success. An SME alone won't win too much business over \$1 million from the Victorian Government. Tendering costs crush them. Any public tender is going to be for over \$100,000, so really SMEs were only in a market for procurement up to \$100,000 dollars. What we did was to change the tendering rules for IT contracts up to \$1 million. Now we have pre-qualified panels with a couple of hundred companies on them. For anything up to \$1 million you only need three quotes and you don't have to put public tenders out anymore. Department's love it, the industry loves it. They save \$40 million in tendering costs and the outcome of this is that 70% of the contracts have gone to local SMEs. Thus it has been a win-win all round. We thought carefully about how we could structure the way we did business, and we wanted to get innovative outcomes as a by-product of how we structure our contracts.

These three examples provide food for thought about how we might think more imaginatively about procurement. The other thing is SBIR. I probably wouldn't sell it as a procurement programme. I'd sell it as an economic development programme that helps departments solve their real life problems. It's a great model to try and solve problems in Health, in Education and other areas of government.

Frank Wyatt

A number of the points I was going to make have already been made by others so I will give you a bit of an eclectic journey through some other thoughts I was having as I was listening to people speak. I have had the good fortune to be able to do a series of studies in South Australia looking at six industry sectors, and looking at the extent to which collaboration is actually driving innovation in those industries. In the course of these studies I was able to mine answers from CEO's about what is frustrating them in terms of innovation. The answers that came back strongly were:

1. The absence of a logical and integrated policy strategy from the Commonwealth or from the State Government. They were left reading the tea leaves in terms of what direction they were actually meant to be pointing their organisations.
2. The fact that the procurement strategies of both the Commonwealth and the States are incredibly conservative.

There are some great case studies of this in the water industry, for example. My favourite story is that if you want to get a contract for putting pipes in the ground you actually have to demonstrate that you've had *fifty years* in-ground experience. So if you're a plastic pipe contractor, come back tomorrow, don't bother being around today. In fact for Riblock their major pipe sales in Australia have actually been to concrete manufacturers who use their water pipes as upright stands for concrete framing. In the meanwhile, they sell pipes extensively into Asia. They were purchased by an international company because of the quality of their innovation, in particular, in refilling old infrastructure pipes with a plastic membrane. This allows cities to avoid having to dig up the road to put in new pipes, and just to push a plastic membrane down through the existing pipe.

Then there is a small manufacturing company in the Adelaide Hills who developed a decoy drone, an object that looks like a torpedo that attracts mines. The decoy produced the same drone as a ship's engine, depending upon the nature of the ship that pushed it out, and the decoys would then attract and destroy the mines. The decoy was so hardy they could pick it up, recalibrate it and put it back in the water again. They sold that to nine countries before Australian Defence actually decided it was a worthwhile product to have.

In another Defence story a contract was won by an overseas company that ended up purchasing a system from a company in Adelaide which had been told that they were too small to be safe to buy from. The overseas company now sells the product back to Coastal Navigation authorities.

I want to talk about Defence a little further, because there are some actually some good elements to the defence system in Australia. One is that there is no other industry sector in Australia that has a 20 year plan for procurement. Global prime contractors in some cases have acted as access points to global markets for Australian SMEs. Thus the procurement strategy as an overall system has enabled some companies to get access to global markets, but not totally. The less obvious concerns for me are that quite a number of the multinational prime contractors source their research out of country. Australia has the highest number of branch Primes of any country in the world!

The Defence system uses a Technology Readiness Level (TRL) scoring system, with "1" being blue sky and "9" being commercialised product. There is very little research occurring in Levels 1 to 3 in Australia, and there's a valley of death between 4 to 7 where nobody wants to invest. Between 7 and 9 there's an enormous amount of engineering consultancy going on, called research, but in fact it's actually consulting. Most of that consulting doesn't require any form of research development, and that's because the companies are actually buying their real research out of country. We face a very serious risk of becoming a nuts and bolts country. We will oil and grease the nuts and bolts rather than generate new innovations that will require development activity in Australia.

Clusters in Australia, including the Defence Industry Cluster, have increasingly become shopping exchanges, where we look for customers to sell to that are around the same cluster, as opposed to innovation exchanges building capability across those clusters. From what CEOs tell me about the scope and nature of collaboration it is clearly evident that only very low level networking is occurring in Australia. It is very evident that we do not have a culture of collaboration comparable to the European clusters for example, or even that which the wine industry used to have at one stage and is in serious risk of losing with the globalisation of that industry.

I think that some of the lessons we can take from the history of programmes like the SBIR scheme is that we're at serious risk of not having a systemic process for innovation in Australia, much less a strategic one. We don't have an effective framework for an innovation culture. Even the funding that's available is going to individual companies and not capable of being aggregated in a manner that brings the intelligence together. Bob Herbert referred to such possibilities in areas like the rail industry. There is already a Defence systems design centre in South Australia. There is work going on to aggregate the capabilities of the three domestic universities in South Australia in terms of their contribution to Defence. This involves looking for capability sets that could be aggregated. It seems to me that if you put all of those elements together and added an SBIR then you'd start to build some strong systemic components of a regional innovation system. SME's at the moment are not integrated into an overall systemic regional innovation system and the SBIR could be a catalyst for doing that. It is businesses, however, that use innovations, and their business models must adapt to extract the best from any invention, science or well-spring of knowledge. Accordingly, I agree with Randall, don't sell this as a procurement strategy, sell it as part of a regional innovation system agenda – or a regional business innovation system – and do it as part of building a whole culture that is systemic for innovation in Australia.

We earnestly need a process that builds national solutions to national issues. For example, if you take the water industry at the moment, most of the water authorities in Australia are under enormous stress. I can name CEOs of those Water Authorities who have serious health problems because of the amount of stress in the system. They are being put under stress from the persecution of media, public expectations, and the drought and so on. Most of the companies in the sector are producing products and selling them as though they are part of the solution to the water agenda in Australia, yet there is no values framework within which those products are actually being sold. The SBIR seems to me a means by which a government can lead a values framework for a systemic change in the culture of developing the solutions that are required for Australia. That framework is not there at the moment.

Discussions

There was wide-ranging discussion at the forum, beyond that which can be captured fully in this summary. Nonetheless several important issues were raised.

One of these concerned the impact of trade rules on industry support schemes. David Connell had pointed out that EU rules around State aid have been a real impediment to the introduction of the SBIR scheme in the UK, but that appropriate work-arounds had been identified. Several participants commented that, in Australia, WTO rules were often invoked without their actual bearing being examined closely. Several people commented that Australia could use the same 'carve out' provisions that the US had adopted in their support for schemes like the SBIR.

There were also some thoughtful interventions about the nature and role of collaborations.

Leslie Butterfield from McLachlan Lister:

I am an SME so I'll put my hand up here for a comment. I am a big fan of collaboration. I think that a large part of Australia's success in the future is going to be through very novel collaborations, such as different parts of different industries coming together. But I'd also like to caution very strongly against mixing collaboration up with procurement. Being able to deliver a product or a service to a government client is going to be all consuming, particularly for SMEs. If you then say on top of that you also have to be looking at a collaborative relationship, we need to remember that running a collaborative relationship with anybody that's going to be done well is also all consuming and very time consuming. I think collaboration is a wonderful agenda but I think it should be a separate agenda because it could be just too much for it to be done well by a lot of SMEs.

Randall Straw:

I think Leslie is absolutely right and that collaboration is a terribly overused word. Quite often when maybe two parties are working together to try and solve a problem, the chances are they've got different agendas, different time scales, and as time progresses their views will diverge. This is the wrong way to get anything done which is close to market. Now a contractual relationship is different, with one organisation leading and sub-contractors undertaking well defined pieces of the task. Preferably there will be only one of those participants doing anything innovative because the last thing you want is two innovative teams. Quite often people use the words collaboration when they're just being polite about a sub-contractor. Sub-contracting is fine; collaboration is for research I think.

Frank Wyatt:

To the contrary, I believe collaboration is central to all innovation and sophisticated procurement practices. The real issue is our level of maturity in being collaborative - what I describe as collaborative competencies. These are sophisticated skills requiring as a minimum:

- Knowing how to select those with whom to collaborate;
- Knowing and applying a values base framework for building shared objectives for collaborations;
- Discerning the value proposition for collaborations; and
- Knowing how this will leverage distinctive competencies in what is done together and how it will be done.

It is people who collaborate and they need a trust framework to build competitive advantage from collaborations; this is rarely developed on a project basis alone requiring higher levels of engagement than transactional exchanges.