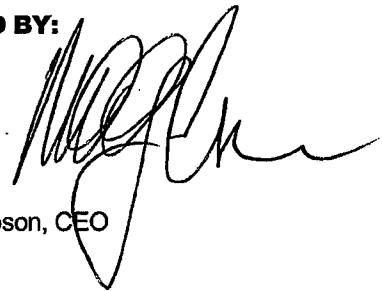**DSTC**

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## DSTC Pty Ltd Submission to:
### House of Representatives Standing Committee on Science and Innovation.
# Marketing our Innovations – can we do it better?

**SUBMITTED BY:**

Mark Gibson, Chief Executive Officer (mark.gibson@dstc.com)
Rob Cook, Chief Technology Officer (rob.cook@dstc.com)
DSTC Pty Ltd (CRC for Enterprise Distributed Systems Technology)
Phone: 07 3365 4310, Fax: 07 3365 4311
General Purpose South Building
Staff House Road, St Lucia, QUEENSLAND 4072

**SIGNED BY:**

Mark Gibson, CEO

## SUMMARY

**The Australian ICT industry has most to gain from creating ICT innovations which provide the infrastructure to enable our major industries (mining, agriculture, tourism, manufacturing, health etc) to increase productivity, innovation and competitiveness in the increasingly global economy.**

From the point of view of marketing our innovations, this means:

- Innovation targeted at, and influenced by major Australian industries.

- Coalitions of major industry companies, research and Australia's ICT industry.

- Commercialisation-ready field trials funded and developed by coalitions.

- Australia's ICT export growth through marketing innovative products proven in Australia's major industries.

- Grant and innovation financing directed at this strategy.

Although this submission is derived from experience in the ICT industry, we believe that there would be benefits from this approach across other fields of science and sectors of industry.

This submission provides background for the recommendations in this summary, with particular reference to DSTC's activities over the past thirteen years, and uses the DSTC experience as a case study in the research and marketing of innovation in ICT.

# INTRODUCTION

This submission concerns research, innovation and the marketing of innovation in the ICT (Information and Communications Technology) sector in Australia. The observations and recommendations may well be relevant to other sectors.

There is an important duality, reflected throughout this submission, between the ICT industry on the one hand generating products and services, and the rest of the industrial sectors who employ ICT to achieve their business goals. The ICT industry produces and sells information and communications hardware, software and services. The rest of industry uses ICT products and services. In fact, ICT represents a critical component of the infrastructure that underpins the successful transformation and development of all other industries. ICT is rapidly increasing its importance with the emergence of the global economy which depends on interconnectivity.

Australia is a strong investor, through government grant schemes and research institutions, in the public development of ICT research and innovation. It is not such a big investor in private sector innovation, nor in taking innovation to market.

ICT within Australia is an industry with a number of systemic problems. Australia has a huge ICT foreign trade imbalance – we import far more that we export and the situation is deteriorating (the deficit in ICT foreign trade in 2003 is given as $14.4 billion, with an average annual increase of 7.4%). There are no large ICT software or hardware product companies and none have emerged over the 50 year history of ICT in Australia. The worldwide industry has matured and become more sophisticated over that period increasing the difficulty of building new companies to become global market sources of ICT products. Innovating and marketing ICT products requires access to, and business skills in, world markets. Australian companies have limited traction in the world's major markets in North America, Europe and Asia. Our largest ICT companies have been in the market for many years and market successful but aging product sets. They must adopt continuous renewal and embrace innovation to adapt to the rapid ICT environmental changes that present opportunity in ICT.

The marketing of ICT innovation depends on a number of factors, some in limited supply in the Australian industry. We need innovations, ones that meet the tests of relevance and timeliness. We need sources of investment and capability to take science across the air-gap from the laboratory bench to a prototype ready for commercialisation. At this stage, commercialisation vehicles in the form of a local ICT industry, entrepreneurial businesspeople with the relevant street-smarts and access to markets, and investment capital combine to develop prototypes into products. The shortfalls in Australia stem from the weak state of the ICT product industry, and from a risk-averse capital market.

These limitations have resulted in Australian ICT innovation and brainpower being transferred to overseas companies. Our companies and technologies are acquired, and the most entrepreneurial of Australian innovators join the brain-drain, to successfully exploit excellent opportunities overseas working for foreign enterprises. While innovation sales bring cash to Australia and Australians, it does little to enhance our ability to develop successful industries or reverse the negative balance of ICT trade.

Our submission draws on DSTC's experience to propose a series of initiatives to improve the marketing of ICT innovation, and we commend these to the subcommittee. The remainder of this submission explains the DSTC context, argues and draws conclusions and outlines in more detail some of DSTC's experiences in the areas targeted by the subcommittee.

**DSTC**

# CONTEXT

The submission arises from the experiences of DSTC Pty Ltd, a company that has operated incorporated ICT Cooperative Research Centres (CRCs) since 1992, and draws on the careers of its current executive management in the Australian and US software industries. Mark Gibson, DSTC's CEO, was formerly a Vice-President of ADC Inc, a company based in Minnesota, and Vice-President of Saville Inc, a company based in Toronto, and before that Managing Director of BHA Computer Pty Ltd. Rob Cook, the CTO, has been the CEO of Astracon Inc and Managing Director of CiTR Pty Ltd as well as an Adjunct Professor at the University of Queensland. BHA and CiTR were both Brisbane-based start-ups.

DSTC has marketed its innovations by licencing technology, forming spin-out companies (five in twelve years), undertaking projects with funding from coalitions of partners from target industries, operating a business for consulting and technology training, and working actively within the international processes creating open standards for the ICT industry. These activities have been conducted in Australia and overseas.

Over its thirteen years in the CRC program, DSTC has participated in four CRC grant awards, and currently operates the CRC for Enterprise Distributed Systems Technology (CRCEDST). In Round 9 of the CRC selection program in 2004 DSTC proposed a new CRC for Interconnected Knowledge Communities. This bid was unsuccessful and DSTC's role operating CRCs will cease in June 2006. The company is focused on ensuring that lasting benefit results from its CRC period.

# SUBMISSION

## FUNDING FOR ICT INNOVATION

Australia has a choice. It can grow our own ICT industry to a size where it is able to compete effectively overseas. Or it can continue to develop ICT innovations that are acquired by foreign companies at a sufficiently early stage of development that the financial benefits of eventual market success are enjoyed by the acquirer, and not by Australia. We contend that a sizeable Australian ICT product industry is important to the future success of the country, to reverse the ICT trade deficit, and to enable our major industries (mining, agriculture, tourism, manufacturing, health etc) to lead the innovation of ICT infrastructure technologies. ICT is vital to the competitive position of all industries and Australian industry needs innovation to continue to grow its global market share and position.

Innovations require markets. Foreign markets are hard to penetrate unless the necessary channel infrastructure is available to identify customer segments, develop business and provide credible systems integration, support and maintenance capabilities. Australian companies that consistently succeed in the larger markets available overseas will usually succeed in Australia first, and build the foreign market infrastructure as they go forward. This means directing innovation towards large local markets, and this means large Australian industries.

At the very start of the pathway to commercialisation, Australia needs to direct funding for ICT innovation away from general purpose ICT research, and towards research directed at ICT for major Australian industries.

## ICT RESEARCH INSTITUTIONS

Public ICT research and innovation in Australia is conducted in:

- Universities
- Cooperative Research Centres

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- CSIRO ICT Centre

- DSTO (defence and security oriented)

- NICTA

- Some Commonwealth and State Government bodies.

In recent years, Backing Australia's Ability 2 has directed some $350 million over 10 years into research and innovation at NICTA, and CSIRO is injecting considerable sums into its ICT Centre. At the same time in Round 9 of CRC funding the total number of CRCs after 2006 was reduced from 70 to 60, and the number of ICT sector CRCs from 10 to 5  In Rounds 10 and 11 of the CRC programme, funding is further reduced and we can expect that the total number of CRCs and the number of ICT CRCs will fall further.  Since universities conduct mainly pre-commercial research, this concentrates the majority of research and innovation in ICT into two large organizations.

While it is comforting to see additional funding for ICT research and innovation, independent · commercially-oriented centres, such as the CRCs, have proved able to innovate and to market innovation consistently more effectively than their larger cousins.  In a 2004 DEST report covering the 2001 and 2002 financial years[1], DSTC was ranked sixth in Australia for research licence revenue per research dollar invested – higher than all but two universities, and higher than CSIRO.

It is important that the Australian research and innovation funding system continues to develop the independent commercially oriented research institutions as a third leg (where NICTA and CSIRO are the other two) supporting the marketing of innovation.  These independent centres should be specifically focused at ICT innovation marketed to Australian major industries and for the Australian ICT industry providing infrastructure to those sectors. We envisage that the total funding (government and industry) for all independent research institutions should be commensurate with that provided to NICTA or CSIRO.

## THE PATHWAY FROM LAB-BENCH TO COMMERCIALISABLE TECHNOLOGY

According to Geoffrey Moore[2] in his book "Crossing the Chasm", the adoption of innovations proceeds through a recognized lifecycle.  Once an innovation reaches the lab-bench stage of concept demonstration, technologists from target markets become enthused and are willing to test drive the technology.  But the hard and increasingly costly work is just beginning.  The lab-bench demonstrator needs to be developed until it reaches a form and a quality where it can be field-tested by potential commercial early adopters of the innovation.  Many innovations fail to clear this hurdle.

The coalition option has been trialled by DSTC and found to be effective in developing innovations targeted at specific sectors.

Some options for funding the development across this first commercialisation air-gap in the lifecycle are:

- Research institution investment (used in several cases by DSTC)

- Shared funding between the research institution and a commercial prospect

- Commercial funding by a single customer company

- Commercial funding by a coalition of organizations from a target industry sector

- Pre-seed venture capital or angel finance

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[1] "National survey of research commercialisation Years 2001 and 2002", DEST, October 2004

[2] *Crossing the Chasm*, Geoffrey A. Moore, HarperBusiness, 1991

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The coalition option has been trialled by DSTC and found to be effective in developing innovations targeted at specific sectors. It produces a commercialisable outcome endorsed by the industry. It maintains the intellectual property in a coalition where the decisions about who commercialises the innovation are delayed until the field-trials are complete. Australian ICT industry (particularly SMEs) which join the coalition, can use the outcomes to further develop products for the sector represented by the coalition.

Other options listed above often commit the intellectual property to a single investor at a premature stage.

Another potential improvement is the introduction of an intellectual property regime similar to the Bayh-Dole Act in the United States. This makes publicly funded research results freely available for commercial activities by domestic organizations.

## FROM COMMERCIALISABLE TECHNOLOGY TO MARKETS

Continuing with the Geoffrey Moore model, early adoption generates enthusiasm within an industry for a technology, but does not project the innovation across the chasm to broad commercial success. Crossing the chasm requires a viable business model and the level of credibility for products based on the innovation that will influence and persuade risk-averse line managers to make positive purchasing decisions.

Turning innovation into products requires a level of investment that underwrites the ongoing development of commercial quality and support, as well as product management and marketing capabilities. This can be done through organic growth, but is more likely to be supported by capital investment. In Australia there are commercial grant schemes which stimulate the investment of private sector capital, and support the development of fully commercial products.

**We contend that commercial grant schemes for ICT should be focused on developments for major industry focused products, encouraging both the major industries and the ICT industry to pursue this route.**

Spinning-out ICT innovations into Australian start-up companies with venture capital financing at this stage has negative side-effects. The preferred exit strategy is a trade sale, rather than an IPO on the ASX or NASDAQ. The acquirer is frequently an overseas company. The sale generates cash for the Australian founders and investors but at a stage prior to the substantial increases in company valuation generated by the future market success of the product. The acquirer reaps the benefits of Australian innovation. Australia gains from the jobs created at a local R&D organization, and from the cash and stock realized from the sale of the company by the founders and investors. This is not enough reward and does not generate a successful Australian ICT product industry.

Australia needs to stimulate the birth and growth of ICT product companies that have substantial domestic markets. This will provide the opportunity to grow into strong corporate entities with the capability to sell into export ICT markets, and develop the global stature to expand and acquire companies overseas. This is only likely to happen if Australia's ICT innovation develops product for Australia's major industries, and there are incentives for Australia's industries to coalesce to take advantage of Australia's innovative ICT capacity.

## BOB HAYWARD RECOMMENDATIONS

In a recent Gartner Group report, Bob Hayward collected a portfolio of recommendations for stimulating the growth of the Australian ICT industry. His aim was to point out what it will take to give Australia a chance to evolve an ICT industry that will be able to compete with those in the highly-developed ICT world, on the one hand, and with the emerging ICT industries in the third world on the other.

Some of his points which impinge on the marketing of innovation include changes to:

- Government ICT procurement to level the playing field for Australian industry

- Taxation to:
    - o Encourage entrepreneurial behaviour through liberal ESOP schemes
    - o Attract investment capital through more liberal CGT arrangements
    - o Provide competitive R&D tax concessions
    - o Encourage participation in R&D offset programs for foreign suppliers
- Trade to improve overseas marketing of Australian IT and benefits available from FTAs.
- Support to increase commercial and export development grant funding
- Telecommunications to provide an infrastructure and pricing environment similar to or better than our major ICT industry competitors. This applies particularly to wireless and broadband technologies.
- Partnering support to address new major issues that confront Australia.

This is an aggressive agenda that would take time to implement. Without a set of reforms, Australia's chances of marketing our ICT innovations in a manner that create a vibrant Australian ICT product industry will be severely diminished. For evidence you only have to look at the consistent failure over the last 50 years to develop successful ICT product companies domiciled in Australian .

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# DSTC CASE STUDY

DSTC is a company formed in 1991 to operate incorporated ICT CRCs. Since then it has operated and participated in four CRC grant awards in the ICT sector:

1   CRC for Distributed Systems Technology (CRCDST 1992-1999),

2   CRC for Enterprise Distributed Systems Technology (CRCEDST 1999-2006),

3   One program of the Research Data Network CRC (RDNCRC 1993-2000), and

4   An expansion for CRCEDST (2003-2006).

In 2004 our Round 9 CRC bid to establish a successor CRC for Interconnected Knowledge Communities was unsuccessful. DSTC is currently investigating other avenues to fund the continuation of DSTC's successful research and commercial directions following the end of CRCEDST in June 2006.

**Distributed Systems Technology**

"Distributed systems technology" describes infrastructure software that enables many separate and disjoint information systems to appear to their users as a single software system which can access information and provide services using the facilities of the whole system. The World Wide Web is a good example, and shared electronic health records across the entire health industry is another.

Since 1992 DSTC has been involved in all aspects of the innovation cycle from concept to commercialisation-ready technology. In doing so, DSTC has:

- generated over $20 million in commercial revenues,

- attracted $45 million in end-user contributions,

- established 5 spin off companies raising $3 million in venture capital.

In addition, DSTC has:

- trained thousands of Australian IT professionals,

held four international conferences, and staged more than sixteen national conferences, each event bringing world experts to Australia to share their knowledge,

- been involved in the educational experience of over 450 postgraduates,

- increased research and commercialisation skills of past and present staff,

- become one of Australia's largest contributors to international ICT standards with active involvement in organisations such as:

   o   Object Management Group (OMG),

   o   World Wide Web Consortium (W3C),

   o   Moving Pictures Expert Group (MPEG),

   o   Health Level 7 (HL7), and

   o   Open Electronic Health Records (openEHR), and

- played a lead role in the development of the Government's Australian Government Locator Service (AGLS)

Unlike many CRC's, DSTC operates as an independent SME. Our core business is undertaking applied ICT research of interest to our participant organisations. Our participants have included eight Australian universities, four research agencies (two international), two State governments, eighteen international corporations, eighteen national companies (including ten SMEs) and five international standards bodies. A list is provided in Exhibit A.

# DSTC RESEARCH AND INNOVATION TRACK RECORD

Our first International Research Advisory Board (IRAB) reviewed the Centre in '93/'94 and commented that, "This is a great opportunity (for DSTC) in a time of great challenges to governments, companies and researchers."

By '95/'96 Dr Michael Brodie from the IRAB review stated, "....The DSTC is very enthusiastic to do both ambitious research and to produce products. These two objectives require very different skills, resources, and strategies. They do not always mix well. I cannot make a concrete recommendation about how to balance these demands. However, it requires very careful handling." This early warning has been heeded and the success that DSTC has enjoyed in handling this challenge can be judged by quotes and case studies below.

In April 2004 the most recent IRAB review stated that, "The strength and diversity of research output is commensurate with world leading research centres in Europe and the US. DSTC has provided Australia with a leading research lab that has significant influence in shaping the direction of enterprise computing."

> Australian research and innovation can create the necessary ICT technology to enhance the productivity and competitiveness of Australia's industries.

In April 2005, a representative from a prominent UK venture capital company reviewed a number of DSTC technologies ready for commercialisation and stated that DSTC, "... was the most interesting of the research institutions I visited in my time in Australia and a credit to your team. I have found the research labs I visited in the last two weeks very patchy in the quality, focus, applicability and management of the research I had seen, so it was pleasing to end the trip on a high note with the best of the CRCs and their kin in all these regards."

DSTC is an example of the role that CRCs play in bridging the gap between research and industry to create innovative technologies for Australia's future. DSTC also provides an example of how ICT can increase the capabilities of existing industries making them more competitive in the global market.

Taking innovations to market is paved with many wrong turns and dead ends. DSTC has managed to navigate a number of ways to create and transition innovation into commercialisation, experiencing more successes than failures on the way. The following section of this submission reflects on some of our experiences.

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# PATHWAYS TO COMMERCIALISATION

When DSTC began operations in 1992 the Internet was an emerging technology that few organisations knew and understood and fewer were able to use successfully. Our research program was tailored to suit the needs of our participant organisations – government ICT-oriented agencies, ICT companies, R&D organisations and faculties in universities. Much of DSTC's research was directed at early ICT adopters, including researchers, and bleeding edge companies. Our product comprised leading-edge innovative tools and technology.

> Australian-owned ICT companies (Telstra excepted) have not achieved the size and capability needed to succeed in global markets.

DSTC has followed two pathways for the commercialisation of its research technology - the earlier experimental strategy has been termed *Find a Wave, Get in Front, Hope for the Best.* The second,. *ICT for Australian Industry,* has been directed at developing innovations to fill perceived gaps in the commercial marketplace for specific industries. The redirection of our strategy has been guided by:

- the degree of difficulty and the sheer cost of projecting original mainstream ICT technology made in Australia into the world market, and

- the needs of existing successful Australian export and strategic industries to exploit ICT as a foundation for their future growth and development in a worldwide marketplace.

**International markets**

*Find a Wave, Get in Front, Hope for the Best* saw distributed systems as an early-stage market, ripe with product opportunity. However Australian industry largely imports ICT trends established elsewhere, "fast following" the leading edge. ICT suppliers in Australia comprise international companies, who concentrate on sales and marketing in Australia, but do little of their global product development here (even less today after a number of companies have closed their Australian R&D facilities), and Australian SMEs who have a limited appetite for adopting and developing innovative new technology.

The market for DSTC's innovations was overseas. As a result DSTC licenced its technology to overseas companies and spun-off start up companies which attacked overseas markets. While this strategy succeeded, and provided jobs for the staff who developed the technology in local R&D facilities, it did little to benefit Australian industry.

**International standards**

*Find a Wave ...* targeted emerging global trends in distributed systems, engaging strongly with the international movements that were developing the necessary distributed systems standards. DSTC's independence of proprietary ICT suppliers often provided an opportunity to secure leadership positions in the influential working groups. Based upon our work in standards organisations, DSTC then researched the technologies, developing early world-leading implementations of the standards, and made them available for commercialisation through licences from DSTC. Involvement in international standards development helped DSTC to develop first-mover technology in market leading areas, and introduced DSTC to the major international players in the field – for DSTC, the channels to international markets.

**Web marketing**

DSTC made good use of the World Wide Web for marketing its innovations. We put links to demonstrations and prototypes on the Web, complete with research and evaluation licences and made them available to anyone who was interested. These advanced prototypes attracted considerable attention resulting in thousands of downloads by early ICT adopters in universities and industry. Over time, DSTC put more development effort into the prototypes that attracted the most market interest. The resulting near-commercial grade software was licenced to customers as DSTC's products. Less commercially attractive, but still valuable technologies, were provided to the market in a form resembling the open-source software of today or continue to be supported and licenced to industry.

**DSTC**

**Start-up companies**

Once a technology had gained a measure of market acceptance, DSTC was in a position to attract venture capital to underwrite the formation of start-up companies. Active Tools ('96/'97), Wedgetail Communications (2001) and Mantara Software (2003) have all followed this road.

Active Tools was acquired by Turbo Linux, a US-based company, which was in turn rescued by Axceleon in the US after Turbo Linux succumbed to the technology bust of 2000. DSTC's technology is still market successfully under the name Enfuzion. This is an example of an innovation that was developed, launched and then sold overseas without significant impact in Australia.

> ICT research and innovation should be directed at economic growth for Australian industry.

Wedgetail Communications needed to grow revenues in the declining markets of the tech-wreck period based in a country with limited local markets. The difficulties of expanding into overseas markets and attracting further Australian risk capital made the establishment of a US base through merger attractive. At around two-years from establishment, Wedgetail merged into Vintela, a US company. This merger is a common outcome for Australian innovation. The innovation creates an attractive business case; an Australian start up is created and, within a short period, and before the company has matured and started generating strong returns, it gets acquired by an overseas company. The intellectual property goes overseas before its potential has been realised, and may make a great deal of money for the acquirer. The Australian founders and investors gain cash and stock, sometimes very advantageously and sometimes not.

Mantara is following a similar trajectory to Wedgetail, but has not reached the overseas acquisition stage yet.

**Transforming Australia's industries**

The *ICT for Australian Industry* strategy is based upon ICT as an enabler for the transformation of Australia's major industries to meet the challenges of operating successfully within an evolving global economy. DSTC aims to be guided by target sectors to create new ICT technology which increases the productivity and competitiveness of specific enterprises and industries. Based on work to date, DSTC and its participants have concluded that productivity and competitiveness can be greatly enhanced by greater interoperability[3] and sharing of information, services and activities based on social networks.

Much of the research to create technology to support interoperability, sharing and collaboration is common across many industries. This infrastructure then supports a range of services which tend to be peculiar to individual industries and enterprises. The demonstrators and application prototypes produced for specific industries and enterprises are used to attract funding from coalitions of industry participants to engineer near-product-quality software and to undertake field-trials.

Real-world field trials secure a high level of commitment from the participants to the technology and demonstrate that the technology can successfully meet industry needs. By the end of the trial the technology has matured to the quality levels of a commercialisation-ready stage and can be spun-off or licenced to organisations within the Australian ICT sector, to develop and deliver commercial products to the industry.

This method creates innovations with a predetermined market, lowering market risk, and increasing the attraction to later stage financiers such as venture capital. ICT industry participants in trials have opportunity and incentive to build business strategies to create and market commercial products, benefiting themselves, DSTC, and the Australian and global industries. It utilises Australian ICT research to create more productive Australian industries.

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[3] The ability of software and hardware on multiple machines from multiple vendors to communicate.
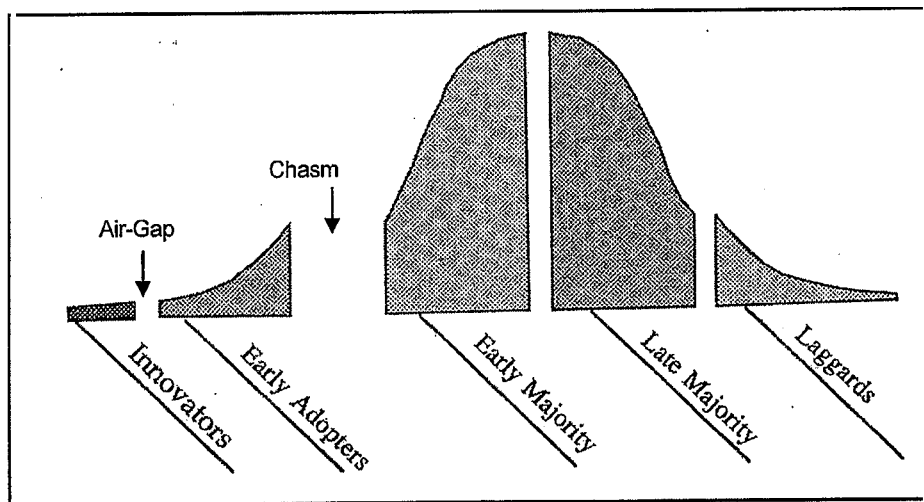
**DSTC**

An example of this strategy in practice is DSTC's shared electronic records project. An information sharing technology developed by DSTC resulted in DSTC signing a $2.9 million contract with the Department of Health & Aging in partnership with the General Practice Computing Group and Queensland Health for an extension to the Health*Connect* trial in January 2004. The funded field trial has generated considerable interest amongst the Health ICT sector and DSTC sees strong prospects for marketing the innovation.

The foundation research has multiple applications which can be tailored to meet the needs of other industry sectors, such as mining and agriculture, provided the Centre can attract further investment.

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# CAPITAL AND RISK INVESTMENT

Geoffrey A. Moore's widely accepted model for the adoption of innovative technology by the market suggests that technology is not smoothly absorbed by customers as it progresses through various stages of market take up. Initially only technologists or innovators in customer companies will consider using the technology. A leap (The Air-Gap) in development and marketing is required to secure early adopters – a few individuals who see benefit for themselves from promoting the technology. A further risky and difficult leap (The Chasm) needs to be negotiated before mainstream purchasers can be secured. This usually involves developing a complete product and establishing a market bridgehead. The subsequent stages are less interesting for this submission.



DSTC's two strategies for pathways to commercialisation, *Find a Wave, Get in Front, Hope for the Best,* and *ICT for Australian Industry* have had different degrees of success in taking technologies across the funding gap between Innovators to Early Adopters (Air-Gap) and between Early Adopters to Early Majority (Chasm).

## CROSSING THE AIR-GAP – INNOVATORS TO EARLY ADOPTERS

In our *Find a Wave ...* strategy DSTC kick-started the progression of the technology across the Air-Gap from the laboratory bench to the development of progressively more sophisticated prototypes by making demonstrations and prototypes available via the World Wide Web. However it did commit DSTC to self-investment in a lengthy program of engineering improvements taking the prototypes towards product status.

Although DSTC self-funded these activities in the *Find a Wave ...* strategy, there are other avenues for financing an innovation across the Air-Gap to a commercialisation-ready state. DSTC uses coalition funding in our *ICT for Australian Industry* strategy to take our electronic health records technology from the laboratory bench to a near-commercial ready product.

**ICT infrastructure can greatly enhance the productivity and competitiveness of Australia's major industries. This is particularly important in global export markets.**

For DSTC's electronic health records software, a coalition comprising the Commonwealth Department of Health and Ageing (DoHA), the General Practice Computing Group, Queensland Health, Sun Microsystems, Ocean Informatics and DSTC jointly financed and resourced the Brisbane Southside Health*Connect* (BSHCT) trial of DSTC's electronic health

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record (EHR) technology. The $2.9 million, nine month trial involving two hospitals, 1000 patients and 100 clinicians in public and private practice resulted in the engineering of a near-product quality software package ready for commercialisation.

A third Air-Gap strategy, attracting pre-seed venture funding, has been investigated by DSTC but not used yet. .

## CROSSING THE CHASM – EARLY ADOPTERS TO EARLY MAJORITY

Promulgating DSTC technology via the World Wide Web attracts prospects interested in the technology. In the cases of Wedgetail and Mantara, these first customers were the trigger that caused the spin-out and generated the venture capital interest to secure the first investments in the new companies.

At this stage, Wedgetail's options were to:

- continue trying to build export sales utilising bridgehead marketing activities such as AusTrade's services,

- acquire a successful company in its target location and market,

- be acquired by another company in its target location and market,

- merge with another company in its target location and market, or

- risk eventually having to dramatically restructure their business.

By 2004 it decided to merge with US company Vintela, heavily diluting Australian shareholders percentage interest in the company. The merger deal was sweetened by additional venture capital financing from the original investors. The Wedgetail R&D group remains in Brisbane, which forms the Asia-Pacific headquarters for Vintela.

The merged company was successful in attracting further investment from Microsoft, enlarging the Brisbane R&D group, and is positioned for a trade sale or possibly an eventual IPO at a much higher valuation. This will greatly benefit the current shareholders, but to the overall disadvantage of Australian ICT industry growth..

## FUNDING INNOVATION ORGANISATIONS

Australia must continue to fund organisations that create innovations. DSTC, along with another four ICT CRCs, was unsuccessful in our bid to securing another seven years funding from Round 9 of the CRC Program.

DSTCs application for the CRC for Interconnected Knowledge Communities (CRCIKC) was an extension of our *IT for Australian* Industries strategy and focused on the needs of existing Australian strategic industries to exploit ICT as a foundation for their future growth and development in a worldwide marketplace.

**Fund and direct research institutions to create industry-oriented ICT.**

The new CRC was intended to research, develop and commercialise the software infrastructure to enable the transformation of industries and enterprises through knowledge sharing, process innovation and creating more effective operational environments through leveraging knowledge capital.

The CRCIKC bid leveraged over $45 million in cash and inkind investments over seven years from industry and other participants. Although keen to engage in CRCIKC, industry requires the support of an endorsed Government program and the ability to leverage their financial commitment though matching Government funds for participants to continue engagement in collaborative research and development programs.

Unfortunately Australia does not have the wealthy philanthropic foundations that can be found in countries like the United States of America that specifically support research organisations

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like DSTC, and there is currently no government endorsed program to gain the maximum benefit from CRCs which have not been refunded.

External to the CRC Program, DSTC is in a funding "no man's land". We do not qualify for funding from the Australian Research Council (ARC) which targets research in higher education institutes and we do not qualify for funding under the Department of Industry's Commercial Ready Program as we are a non-tax paying entity. DSTC and other CRCs have generated a wealth of commercially exploitable IP and commercialisation models, but our research programs have nowhere to go when CRC funding ceases and it's possible that the benefit associated with each CRC will be lost to the nation.

# SKILLS AND BUSINESS KNOWLEDGE

Marketing innovations requires entrepreneurs, street-smart research and development professionals, and well-developed connections with national and international markets. DSTC's approach to developing skills and business knowledge is:

- Undertake education activities that support university students,

- Hire young researchers and include them in our business development activities,

- Set an expectation that research staff are involved in commercial activities,

- Expect and encourage staff with a few years experience at DSTC to move into the private sector,

- Strong interaction with the marketplace to prioritise DSTC research and ensure our technology is commercialisable, and

- Extend our international reach through involvement in international standards.

DSTC has been involved in the education experience of over 450 university students. Our education activities range from student supervision to top-up scholarship funding, to student vacation project work. Our objectives are to help produce market-ready graduates and commercially-savvy researchers. We do this by providing space, equipment, funding and supervision to Honours, Masters and PhD students who theses topics are relevant to DSTC's research objectives, and by providing vacation employment for graduated Honours and Masters students, a number of whom end up employed full-time by DSTC.

> Capability to take science across the air-gap from laboratory bench to prototype requires entrepreneurial business people with the relevant street-smarts and access to markets.

We hire early career researchers and strongly encourage them to engage in business development activities beginning with presentations to industry and progressing to the entrepreneurial development of their innovations. DSTC's hybrid research/commercial culture was accelerated in 1994 when DSTC mandated that research staff spend 20% of their time in business development activities. This created an incubator-like environment for the development of commercial skills amongst staff. DSTC researchers learn commercial reality by doing, they engage in a variety of business development activities signifying a huge mind shift from the research-only focus of early DSTC to a much broader understanding of our role in the economy.

DSTC's commercially-focused culture generated four spin-off companies. Each of these start-ups was driven by one of the DSTC research staff who adopted the role of entrepreneur to lever the technology out of DSTC and into the market. These people expanded their knowledge on the journey to cover business issues such as marketing, tax, governance, business law, human resource management, accounting and capital raising.

As a CRC, DSTC has always had linkages to the marketplace through our industry partners who provide a industrial foci for our research program. We continue to extend these linkages

**DSTC**

through the creation of interconnected knowledge communities when we collaborate with a coalition of non-ICT industry partners to develop ICT infrastructures to assist them meet their business objectives. Examples of this extension is our work in the health sector on the HealthConnect Project, as well as our data capture, annotation and retrieval project work with the nanotechnology, fuel cell and defence industries.

DSTC extends its knowledge of the global research and commercial environments through our presence in international standards bodies. International standards organisations are made up of hundreds of members, while some of these members are large multinationals such as Boeing, Microsoft, DaimlerChrysler, NEC, Nokia, AT&T and Cisco Systems, all members are market leaders. Engagement with these organisations through activities such as standards meetings places DSTC "at the table" providing an environment where business knowledge, such as early warnings of shifts in trends, is acquired and brought back into our innovations as they progress towards commercialisation-ready products.

> Encourage coalitions of industry partners to finance the development of research into commercialisation-ready technology.

# EXHIBIT A – LIST OF DSTC PARTICIPANTS SINCE 1992

## INDUSTRY – NATIONAL

Aspect Computing [1994 to 1997]

Bay Technologies [1995 to 1996]

Cirrus Technologies [1997 to 2002]

CITEC (Queensland Government) [1992 to 2004]

CiTR [1992 to 2003]

Dialog [1999 to 2002]

First State Computing [1997 to 1999]

Forge Information Technology [1997 to 1999]

Hendy Robinson [1995 to1997]

Inprise [1998 to 1999]

Jtec [1992-1993]

Leaders IT [1999 to 2003]

Melbourne IT [1998 to 2002]

Mincom [1997 to present]

Software Associates [1997 to 1999]

Technology One [1999 to 2002]

Telstra [1992 to present]

The Salmat Group [1995 to 1997]

## INDUSTRY – INTERNATIONAL

BEA Systems [1997 to 1999]

Boeing Australia [1999 to present]

Data General [1999 to 2002]

Digital Equipment Corporation (Aust.) Pty Ltd [1992 to 1998]

DMR Consulting [1998 to 1999]

Forté [1998 to 1999]

Fujitsu Australia [1993 to present]

Hewlett Packard [1995 to 1999]

IBM Australia [1994 to 2002]

Iona Technologies [1996 to 1999]

MCI Systemhouse [1998 to 1999]

Microsoft [1999 to 2002]

Novell [1996 to 1999]

Oracle Systems (Australia) Pty Ltd [1994 to 1998]

RSA Development Pty Ltd [1999 to 2002]

SAP [2001 to 2002]

Sun Microsystems [1997 to present]

Transarc Corporation [1996 to 1997]

**DSTC**

## RESEARCH ORGANISATIONS

CSIRO [1993 to present]

Defence Science and Technology Organisation [1992 to present]

GTE Laboratories USA [1994 to 1998]

Project Pilgrim (University of Massachusetts, Amherst, USA) [1994 to 1997]

## UNIVERSITIES

Bond University Ltd [1992 to 1999]

Griffith University [1992 to present]

Monash University [1999 to present]

Queensland University of Technology [1992 to 2003]

The University of Canberra [1992 to 1997]

The University of Queensland [1992 to present]

University of South Australia [2004 to present]

University of Technology, Sydney [1992 to present]

## GOVERNMENTS

Government of South Australia [2004 to present]

Queensland Government [1992 to present]

## INTERNATIONAL STANDARDS ORGANISATIONS

Object Management Group [199 to present]

Open Environment Group [1995 to 1997]

Open Software Foundation [1995 to 1997]

The Open Group [1998 to 2002]

World Wide Web Consortium [1999 to present]