TRANSFORMING AUSTRALIA'S DEFENCE INDUSTRY INTO A GLOBAL INNOVATOR

Defence Teaming Centre

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Executive Summary

According to a World Economic Forum survey from 2016, 2 out of every 3 children entering primary school today will end up in careers that don't exist yet. This is the pace at which our world is evolving. When undertaking operations, the Australian Defence Force (ADF) is always seeking advantage. Advantages lead to confidence in being able to act safely and successfully. One mechanism for gaining advantage is through access to superior capability and technology. This requires the support of Defence Industry to deliver.

To maintain the status of superior capability and technology requires continued innovation. Innovation is a mindset based on calculated risk-tasking and on the pursuit of new ideas. Innovation is not merely invention; it can also take the form of a new approach, a new process or even just a new way of thinking that adds value, or in Defence parlance, a capability edge.

For a company to be truly innovative, innovation must be a core part of the company vision. There needs to be a culture where creativity is valued, and that idea generation and adoption is encouraged across all levels and aspects of a business. There also needs to be tangible investment. This is not just investment in terms of spend, but also time and tools to unlock new ideas. There is risk associated in pursuing the new, or the unknown and some ideas will fail. Staff should be encouraged in these scenarios. A fear of failure (and some resulting negative reaction) leads to people doing just what they have always done and inhibits creativity. Additionally, innovative companies understand their customers and markets well.

Unfortunately, there are several barriers that make innovation in Defence more difficult. Chief among these is that Defence is typically risk averse due to two main factors. First, that Defence products must be reliable in-service and hence preference is given to tried and tested technologies. Second, that Defence is funded by the Government which is typically risk averse itself due to the impact of public criticism if projects have undesirable results.

To unlock real innovation on a grander scale within Defence Industry we are proposing a number of recommendations. It is acknowledged, that the Defence White Paper, the Defence Industry Policy Statement and the Integrated Investment Program have proposed and incorporated key initiatives to reform the Defence sector. However, we believe that more can be achieved.

Positive change will require effective leadership and a desire to change culture. All sections of Defence, including Government, industry, research organisations and academia must embrace change together. This includes adopting new attitudes towards creativity, risk, collaboration, investment (both time and money) and flexibility.

Defence's strategy around procurement and investment must evolve. Current government investment in innovation is estimated at around 0.7% of the annual Defence Budget. To unlock the innovation potential of the sector this must be increased into the realm of 5% in an incremental fashion. Importantly, this should not just be funnelled into an innovation fund but become a standard element of procurement.

Greater emphasis needs to be placed on developing Australian sovereign capability. There is a need to build the capability to design and develop in Australia, not just assemble/build another countries technology. Doing so will provide not only the best opportunities to unlock innovation but also develop export markets for Australian Defence Industry. An export market for Defence would increase the national trade diversity and continue to safeguard Australia's economic prosperity.

To transform Australian Defence Industry into a global innovator, a leader, we must challenge everything and not settle on the status quo. We must do things differently, together.

Contents

Background

Definitions

Throughout this paper the terms “Defence” and “Defence Industry” are used and hence the below descriptions have been included:

- Defence – The Australian Defence Organisation (ADO) consisting of the Australian Defence Force (ADF) and the Department of Defence, which includes the Capability Acquisition and Sustainment Group (CASG) and the Defence Science and Technology Group (DSTG).
- Defence Industry - The Australian defence industry employs around 25,000 people, with global defence companies (‘prime companies’) accounting for around 50 per cent of employment in the industry. Over 3000 small to medium enterprises operate in Australian defence industry, mostly as subcontractors to prime companies. Australian defence industry is located all around the country providing essential capability, services and support to the ADF.

Defence Industry Policy Statement

In 2016 the Department of Defence issued the Defence Industry Policy Statement (DIPS) [1] with the Defence White Paper to acknowledge the fundamental contribution that Australian industry provides to Defence capability. The DIPS four focus areas are:

1. Delivering Defence Capability
2. New Approach to Defence Innovation.
3. Driving Competitiveness and Export Potential
4. Doing Business with Defence: Cutting Red Tape

The DIPS outlines three programmes which aim to improve Defence and Defence Industry collaboration and innovation, namely:

- The Centre for Defence Industry Capability (CDIC); to drive the strategic partnership with Defence.
- The Next Generation Technologies Fund to invest in strategic technologies that have the potential to deliver game-changing capabilities.
- The Defence Innovation Hub to undertake collaborative innovation activities from initial concept, through prototyping and testing to introduction into service.

The DIPS is an indication that the government recognises the importance of the Defence Industry to Defence achieving its objectives, as well as recognising some of the current challenges that need to be overcome for Defence and Defence Industry to achieve their objectives. Furthermore it shows that the government believes that Defence and the Defence Industry needs to be innovative and improve its approach to innovation.

Introduction

The DIPS represents a good start to changing the Defence and Defence Industry partnership and re-invigorating innovation within the Defence Industry. However, we believe that further work is required and hence this paper discusses recommendations to transform the Defence Industry into a global innovator.

Research has been conducted in a number of areas to develop this paper. These include why innovation is important to Defence and Defence Industry, what is innovation, what current business practises global innovators use to foster and support innovation as well as the barriers associated with innovation in Defence. Finally, this paper provides recommendations, based on this research, to transform Australia’s Defence Industry into a global innovator.

Why is innovation important?

Courtesy of Albert Einstein:

If you always do what you always did, you will always get what you always got.

Why is innovation important to Defence?

Defence spends considerable time developing strategy in order to be prepared in pursuit of Australia's interest should the need arise. Australia has a relatively small population and military. For this reason, strategy has been directed towards cooperation with other nations in our region as well as pursuit of technological/capability edge over any potential adversary. However, Defence spending is increasing across the region on the back of economic growth. From the 2016 Defence White Paper [2]:

It is natural for countries in the Indo-Pacific, including Australia, to modernise their military capabilities as their economies grow, technology develops and new capabilities become available. The pace of military modernisation in the Indo-Pacific is underpinned by the very positive economic transformation of the region.

Military modernisation in our region will not be directed against Australia, but it will mean the defence capability edge we have enjoyed in the wider region will significantly diminish.

A capability edge provides an advantage. Advantages lead to confidence in being able to conduct operations safely and successfully. This is vitally important as the Australian Defence Force places exceptionally high value on its people and their safe return from any and all operations. Unfortunately, adversaries also seek advantages. It is in the nature of warfare that many advantages gained are transient. Therefore it is imperative that there are both proactive, innovative pursuits to establish advantages and scope for reactive, quick responses to emerging threats when challenged.

Note that it is not just the economic climate that provides a source of challenges. The nature of warfare itself is changing. Terrorism and the need for Defence against attacks by non-state actors has become an important consideration. The result is a challenge is described as Hybrid Warfare, a combination of conventional, irregular and asymmetric means of conflict. A white paper produced by the United States Army Special Operations Command (USASOC) titled "Counter-Unconventional Warfare" describes an expansion of this concept to include sponsored groups [3]:

While the Joint Force must prepare for protracted conflict with increasingly powerful non-state actors, we must also counter state adversaries who use modern military technologies as well as proxies and surrogates, difficult to detect in a timely fashion via conventional method. Countering these hybrid threats will place a premium on broad-based intelligence efforts, rapid, coordinated innovation and adaptation, and a commitment to undermining the means and will of adversaries to persist…

As Defence projects its strategy, innovation is required in order to allow for sufficient ability to adapt to the evolving landscape.

Why is innovation important to Defence Industry?

The Australian Government recognises the importance of Australian Defence Industry and innovation. From the 2016 Defence White Paper [2]:

Defence's ability to achieve the Strategic Defence Objectives relies on its access to high levels of capability and technology. This requires a focus on critical support from Australian defence industry to deliver warfighting equipment and partnering with Defence to deliver leading-edge innovation and research.

The Government recognises the vital contribution to defence capability provided by Australian defence industry and science and technology research organisations. Australian defence industry provides a

range of critical direct and support services and is a fundamental input to Defence capability. Innovation drives the development of defence capability.

However, it is not enough that Government recognises the place of Australian Defence Industry. With a Government focus on innovation, it leads to an environment where new players may emerge to increase competition. A report written by KPMG titled "Defence Innovation Redesigned" highlights this possibility [4]:

There may soon be a wave of traditionally 'defence-averse' agile players entering the sector – with associated benefits for the broader Australian economy. New Defence investment could provide the catalyst to realise the economic and capability value in the abundance of high-technology, high-growth businesses already active across multiple industries in the private sector.

New start-ups are emerging everywhere. The list of 'unicorns', private companies valued at $1 billion or more, continues to grow on the back of significant market investment and a new generation of disruptive technology [5]. There are great examples of companies that have been surprised by new players to a market or a disruption in the market itself. Consider, Blockbuster video stores, Kodak, Nokia or Borders book stores to name a few. Defence industry must itself innovate in order to remain competitive and relevant to offer the services, products and capability that the ADF will require.

Why is innovation important to Australia?

Ben Mitra-Kahn, Chief Economist at IP Australia put it this way [6]:

Innovation is important because innovation drives productivity growth. Productivity growth is what determines our long term prosperity. It determines our wellbeing in the future and that's really the aim of economic policy at the end of the day. Now we can add more labour and capital, but ultimately in the modern world, it's innovation that drives productivity. That's why it is key for us.

Innovation is important because it is a pursuit towards continued and future wellbeing. The world does not stay the same and nor does any one person's or one company's place in it. Australia is a prosperous nation and Australians enjoy a high quality of life. Australia has benefited greatly from export trade involving food and natural resources. However, this status has slowly started to decline of the past few years. Australia could stand to benefit from establishing an export capability around Defence Industry. This would provide an injection of diversity into Australia's international trade portfolio. Being an attractive trade partner goes a long way toward national prosperity.

What is innovation?

The 2016 Defence Industry Policy Statement states:

Driving Australian innovation is a critical element of the Government's vision for the nation.

But what is Innovation?

Every business leader agrees that it is important, but nobody can quite seem to agree on what it is, or what it means. A simple Google search provides over 300 million results with thousands of different definitions.

In our opinion innovation is a mindset based on calculated risk-tasking and on the pursuit of new ideas. Innovation is not merely invention or technology; it can also take the form of a new approach, a new process or even just a new way of thinking that adds value

Innovation involves the deliberate application of information, imagination and initiative to achieve improvements in applications, processes and products for a business or organisation.

Innovation can be separated into two main types; evolutionary and revolutionary:

- Evolutionary innovation is brought about by many incremental advances in technologies or changes in process.
- Revolutionary innovation can be described as a radical and discontinuous leap to completely new ideas or inventions. It can be a disruptive or new way of thinking and is sometimes synonymous with risk taking.

In terms of customer focus, evolutionary innovation focuses on supporting today's customers, whilst revolutionary innovation focuses on supporting tomorrow's customers. [31]

As part of the research conducted it was identified that there are already many examples of innovation within the Australian Defence industry. Some prime examples are:

- The GREEN & GREY GUM counter improvised explosive device initiative, which showed the power of collaboration to rapidly support the needs of Defence [32].

- The CEA technologies radar is a great example of the power of designing and developing here in Australia [33].

- The Collins submarine project's 2 year full cycle docking is an example of process driven innovation where multiple challenging initiatives were required to achieve a desired outcome [34].

However this paper proclaims these examples are not as common place as they should be and hence new approaches are necessary to transform Australia's Defence Industry into a global innovator.

What makes a company innovative?

To understand how to transform the Australian Defence Industry into a global innovator, research was conducted into what makes a company innovative and considered non-Defence companies which can be identified as leading global innovators.

This research highlighted key areas associated with a company's innovation performance and these are summarised in this section.

Leadership and Culture

Leadership is a fundamental input to the innovation success of a company. A recent survey of 1200 executives [7] highlighted that strong senior leadership and culture are key to the innovation success of a business (Figure 1).

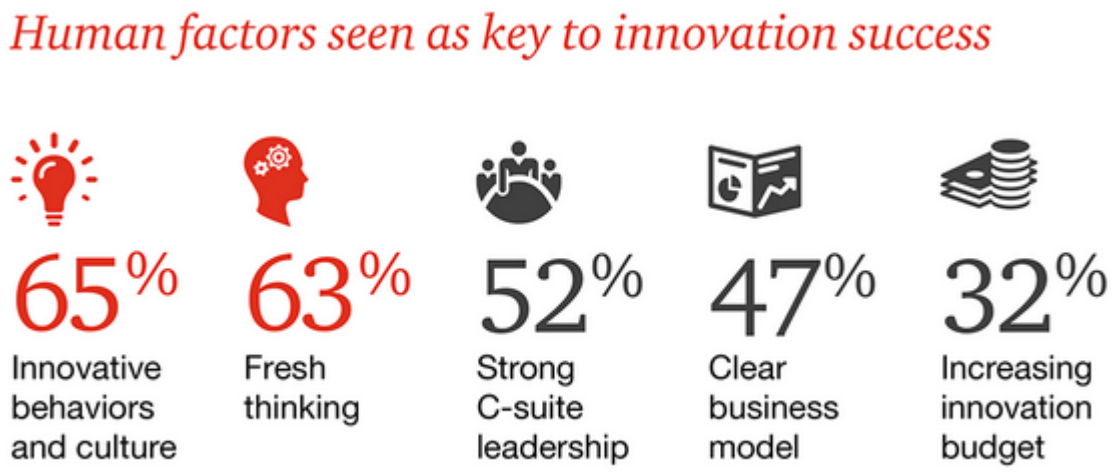

Figure 1 Factors Key to Innovation Success

A key component of the establishing this innovation culture is recognising that innovation is not confined to a Research and Development (R&D) department. Each and every department within an organisation must be included for a true innovation culture to be established. Microsoft is example where employees are actively encouraged to embrace product, business model and policy innovation to unlock the potential of all employees [8].

Innovation must also be prioritised as a key aspect of everyday business. How global innovators do this is diverse, whether it is by regular dedicated time for creative thinking such as Googles famous 20% time [9] or whether it is the inclusion of innovation in performance metrics as is undertaken at 3M.

If we look at the case of 3M, they employ a 30% rule where 30% of a division's revenue must be produced from products introduced in the last four years. This requirement is linked to performance goals and rewards structures which drives a culture of creativity and continuous thinking [10].

Investment

Investment in innovation is integral to the success of an innovation culture. The nature and size of this investment varies dependant on the company. Some major technology companies spend billions annually on innovation as highlighted in the 2017 innovation study [11]. The research conducted for this paper however highlighted that whilst the total level of investment may vary markedly, the nature of the investment was similar.

People must be provided the time for creative thinking. As highlighted previously, Google have done this using the '20% time' concept whilst 3M use a similar concept called '15% time'. This level of investment may not be an option for all companies but the concept of dedicated time for creativity at a lesser frequency is still valid. Some companies such as the TATA group have used the concept of innovation competitions to unlock creativity [9].

People must also be provided with tools, processes and support to develop their ideas. Autodesk, a leading software company, provide workshops to their employees on what to do with their good ideas. Autodesk also provide training and resources on how to develop business pitches to highlight the value of an idea [8].

Risk Management

Innovation will be stifled in risk adverse environments and so a good model for embracing (and managing) risk is essential. Some ideas will work first time, others will require evolution and some simply won't work out. Innovative companies understand this concept well.

In an article on the Seven Essential Characteristics of Innovative Companies [12] it is highlighted that if a company has a positive attitude to risk, its employees will likely be more willing to take on more challenging and creative ideas. There is an implied level of trust within the organisation. Whereas, the opposite will occur if failure is seen as a negative that may impact an individual's career. In this case, employees will avoid risk and hence innovation at all costs.

Innovation is more than technology

Innovation constantly gets associated or confused with technology. Innovation can take many forms as highlighted earlier with Microsoft actively promoting process and a business model innovation to unlock the greater potential of their business.

Innovation can be in the product, process, service, customer experience or business model.

The smartphone is an excellent example of where established technologies were combined in a new and innovative way to create a product which has ultimately revolutionised the telecommunications sector.

Toyota is an excellent example of the power of process innovation to deliver improved quality and profitability to a business. The 'Toyota Way' has been described as a system design for people to continually improve their work [13].

The Rolls-Royce "Power by the Hour" (now Corporatecare) concept is an excellent example of service innovation. A complete engine and accessory replacement service is offered on a fixed cost per flying hour basis. This aligns the interest of both manufacturer and operator and allows operators to remove risk related to unscheduled maintenance [14].

Netflix is an example of disruptive business model innovation. They offered the same product as their competitors. They then disrupted their own business model with introduction of streaming over traditional DVD supply and were able to put their competitor Blockbuster out of business [15].

Customer Focus

Innovative companies are customer focussed and invest in understanding their customer and the market they are trying to service.

The Amazon "working backwards" concept is an excellent example of being customer focussed [16]. For each new idea, three short products are produced. The first is a press release describing the product in a way that is compelling to the target customers, highlighting how this product will solve a problem or fill a need. The second is a frequently asked questions list to think about the problems a non-expert

customer may have using the product. The final is a portrayal of the customer experience. All of these items are designed to get the person proposing the idea to think about the customer's perspective.

Another example of customer focus is the customer led innovation approach employed by the Xerox Corporation. The employees of Xerox frequently seek opportunities to work directly with customers and also employ methods to learn about customer needs and issues. The customer is viewed as a partner in innovation [17].

Collaboration and teaming

Diversity of thinking can greatly improve the strength of an idea. Understanding that people have mastery in different areas which can be brought together to unlock potential is a key concept that appears common among the current global innovators of today.

An excellent example of having a focus on collaboration is Xerox Corporation. As mentioned previously, they have a focus on working with their customers to clearly understand their needs. They also attempt to have a balanced innovation portfolio. As part of achieving this balance, approximately 30 percent of their projects are partnership projects with a focus on co-development to accelerate project outcomes. These partnership projects are then supported by incubation and exploration projects to achieve an overall innovation balance [17].

Barriers to Innovation

There are several barriers to innovation in the Defence Industry; this section discusses some of these challenges.

Risk Management Culture

Innovation by its nature is associated with increased risk. Hence the Defence Industry ability to innovate is affected by its risk management culture. The Defence Industry is typically risk averse. This is due to two main factors:

1. The requirement of the Defence products to be reliable in-service and hence preference for tried and tested existing approaches/products/technologies.
2. The Defence Industry is funded by the Government which is typically regarded as risk-averse. This risk culture of the Government and its public servants is a result of the potential impact of political and media criticism of the Government if projects or products have undesirable results.

This leads to a culture where it is it better to avoid risks to avoid these negative outcomes. The result of this risk averse culture is a barrier to innovation.

Procurement Policy

The current Defence procurement policy while necessary to ensure the 'efficient, effective and ethical use' (Chapter 4 of [28]) of public resources in a way consistent with government policies, is a barrier to innovation. As seen in Figure 2, the Defence procurement policy is to ask the market to respond to a detailed set of requirements, developed based on internal knowledge and/or externally supported scoping. While this enables a simplified evaluation of the market it can reduce the innovative solutions.

Figure 2: Defence Procurement Cycle (Figure 2 of [28])

Innovative solutions are often not part of large submissions as the specifications take time to develop and finalise. Hence, new/experimental technology represents additional risk/complications. In addition, while 'value for money' is the basis of Defence purchasing (Chapter 4 of [28]), this devalues innovation as competitors will be reluctant to include features that are not mandatory. Hence, innovations can end up in a 'nice to have' appendix, if included at all. Inflexible standard contracts and mandatory terms and conditions can also serve to discourage innovative solutions to public sector requirements.

Major asset procurements have been largely Australian-ised versions of imported platforms/technology. This is a barrier of innovation as the major design work is not done in Australia and hence limits the opportunity and ability for innovation by the Australian Defence Industry.

It should be noted that the government has established an Innovation Hub and Next Generation Technology fund, to help stimulate innovation within the Defence Industry. However, whilst the standard procurement policy continues to see innovation as an optional benefit rather than a core philosophy there is little framework to help convert outcomes from these initiatives into the standard Defence procurement and hence into service.

Rate of Innovation versus the Defence Project lifecycle

Technology is continuously improving our capability such that we can do more, do it quicker and do it cheaper. Furthermore, the rate at which technology is improving is also increasing as shown in Figure 3, meaning that the time between technological advancement is decreasing.

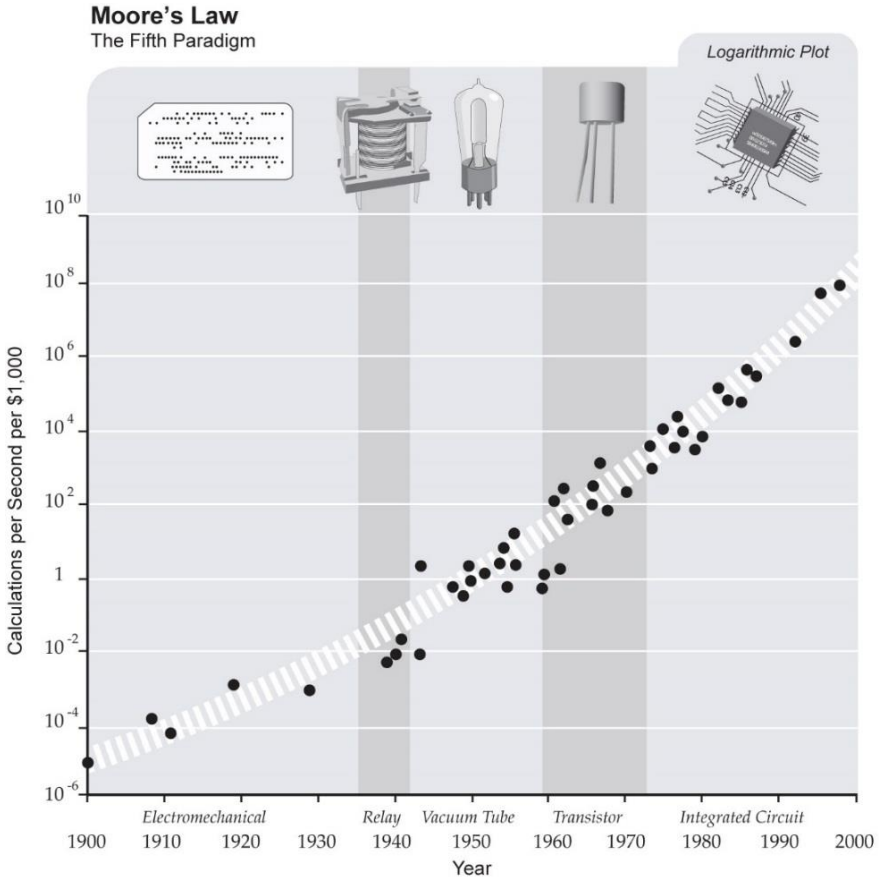

Figure 3: Moore's Law - The Fifth Paradigm [18]

The approximately annual new product generation cycle of an iPhone for example, enables product development to keep pace with changing technology and fosters innovation. Comparing this timeframe to current and previous Defence project phase lifecycles as shown in Table 1, it can be seen that over the life of a Defence asset there will be significant technological advancements.

Table 1: Sample of Defence Project Lifecycles

Platform/Project	Phase	Period	Reference
AP-3C Orion Aircraft	Service	40 years	[19]
SEA 1448 Phase 2A - Anzac Ship Anti-Ship Missile Defence	Upgrade Project	14 years	[20]
JP 2048 Phase 4AB - Landing Helicopter Docks (LHDs)	Acquisition	9 years	[21]
LAND 75 Phase 3.4 - Battle Management System	Acquisition	5.5 years	[22]
JP 2008 Phase 5A - Indian Ocean Region UHF Satcom	Acquisition	9 years	[23]

This can be a barrier for innovation in two ways. Firstly technological advancement (and more generally innovation) means that the Defence assets, over their life will suffer from capability degradation (compared to the market) and likely suffer obsolescence issues too. Design activities to address this issue are limited to irregular upgrades and addressing sustainment issues. Secondly the long timeframes between procurements mean that significant design activities are many years apart; this lack on continuity inhibits industry capability growth and limits innovation opportunities.

Defence Budget

The budget available to the Australian Defence Industry impacts its ability to support innovation. Reviewing the recent Defence budgets for various nations in terms of dollars per year and %GDP [24] [25] it is a fair conclusion that Australia's Defence expenditure is on par with the global average. Australia is ranked within the top 15 worldwide for Defence spending and this position has been fairly consistent over the last 5 years. However, from an innovation perspective, there is an issue of how and where this budget is spent rather than simply a matter of an insufficient Defence budget.

The government's investment in innovation initiatives for Defence is $1.6bn over the next 10 years [26], this equates to $0.16bn annually and approximately only 0.7% of the annual Defence expenditure. As outlined previously many non-Defence technology companies are investing billions annually (highlighted in the 2017 innovation study [11]); this represents an investment of an order of magnitude greater in value. The effect of this investment is highlighted by the rate of technological change as shown in Figure 3 and demonstrates how highly they value innovation as part of their strategy for growth. This investment is also directly linked to their business growth as compared to the government investment which, as previously discussed, is outside the standard Defence procurement policy.

Political Cycle

Innovation typically requires some form of up-front research and investment as it can take several years to develop from theory to concept to proven capability. Hence innovation requires long term thinking, not simply focus on short term goals.

The Defence Industry is primarily funded by the Australian Government. The three-year political cycle impacts innovation in two main ways:

1. The three-year cycle introduces a bias towards short-term goals and outcomes devaluing and neglecting longer term issues.
2. Uncertainty of continued funding and changes in strategy due to changes in political leadership creates uncertainty in the Defence industry. This impacts the industry's willingness to invest in innovation/capability development activities.

In the past decade, there have been five different governments and seven different Defence ministers [27].

Measurement and impact

Innovation rarely features in a performance measurement system. It could be said that in industry what is not measured is usually not seen as important. Innovation, especially the impact/benefit, can be much more difficult to quantify compared to traditional earned value metrics. The exception being the resource/effort invested in innovation effort. It can take some time for measurements to become clear and representative. Being unable to easily demonstrate the benefits of innovation can be a barrier for investment in innovation activities.

Recommendations

The government has identified it must improve industry engagement to unlock capability for the Australian Defence Forces; Industry is a fundamental input to this capability. It has also realised that to maintain the required level of capability, innovation is required to unlock new technology and value. The 2016 DIPS outlines the steps government are proposing to improve this situation however we believe more is required.

Reflecting on the research conducted as part of this concept paper, the areas we believe are crucial to unlocking the innovation potential of the Australian Defence industry are grouped into three main areas.

Culture and Leadership

Reflecting on what the current global innovators do highlights the importance of leadership and strategic direction. Good leadership contributes to a culture that puts tangible value on innovation, new ideas and challenging the status quo.

Innovation does not solely come from R&D departments but from all aspects of an organisation. Innovative companies understand this concept and invest time and money in innovation continually as part of normal business. They are also very customer focussed and target understanding their customer/market well to enable meeting specific needs.

To unlock the true innovation potential of the Defence sector, a culture conducive with innovation needs to be established. This will require effective leadership and a desire to change from all sections of Defence, including Government, industry, research organisations and academia.

It will require being open minded to new approaches more in line with current innovative companies in a number of key areas such as creativity, risk, collaboration, investment (both time and money) and flexibility.

Whilst the nature of these new approaches will have variances between organisations, concepts such as empowering people with time for thinking and establishing methods to capture and harness ideas in an effective manner should be common.

We also believe an increased sovereign capability focus is a key enabler to unlocking product and technology innovation in Australia. This focus can deliver a number of benefits but will require leadership in decision making.

A positive first step in this change of thinking and establishment of this culture would be adopting a non-partisan political approach to Defence planning and strategy. This would be powerful recognition of the value of collaboration, demonstrate strong leadership by the government and create greater stability for the sector to foster innovation by removing the influence of political cycles.

Without establishing a true culture of innovation the full benefit to the Defence sector will ultimately be limited.

Procurement and Investment

Defence's procurement and investment strategy must evolve. Current government investment in innovation is estimated at around 0.7% of the annual Defence Budget. An increase in funding is required to unlock the innovation potential of the sector. Our recommendation is that investment should be increased into the realm of 5% over a period of five years.

It is important to recognise that this additional funding should not just be funnelled into an innovation fund but rather become a standard element of the Defence procurement process. The Innovation Portal is an excellent concept to pitch ideas and has a place, but, with no direct link to the rest of Defence procurement, it will not drive total industry innovation.

This increase in funding is not limited to Defence. Industry must also invest in itself to foster innovation as part of everyday business and reinvest the financial benefits of innovation to further develop innovation practises. Tools and training must be provided to staff to aid in the innovation process.

We also recommend that industry incorporate methods to measure innovation. Measuring innovation is difficult and the exact measures will be a nature of each business, but, this approach will increase the importance of innovation. Some examples include:

- The Innovation Sales Rate (ISR), a measure of the percentage of sales that is sales of new products or services.
- The amount time dedicated by senior management to innovation.
- Measuring innovation ideas suggested and implemented over the period, similar to current measurements of workplace safety i.e. measuring lost time, near misses etc.

The government procurement assessment criterion should consider the Innovation performance of a tendering company as recognition of the importance of innovation. This would involve companies having to demonstrate their business innovation models, programs and policies for consideration as part of the overall tendering assessment. This approach would not be suitable for all procurement process but would be advisable for medium to large procurement activities.

In addition to increasing innovation funding, Government must also update tendering and contracting models to reflect innovation as a key element of the procurement strategy. We recommend that some of the increased innovation funding is distributed to this action as there is significant innovation potential in this area. This involves being open to new ways of doing business to allow industry flexibility in meeting Defence's needs and removing unnecessary barriers.

If Defence can outline its needs, industry may be able to address these not only with the product or technology but how it is supported, upgraded, evolved etc. The innovation is in the overall capability delivery as much as the product itself. An example of this concept would be combined acquisition and sustainment programs with a focus on through life development and capability enhancement; the concept of "design for upgrade" to maintain a capability edge over time. Another example is investigating the potential of increased service based contracting models for capability procurement similar to the Rolls-Royce "Power by the Hour" (now Corporatecare) concept.

Other ways the procurement and tendering models could be improved to increase innovation potential are:

- Lowering tendering and contracting costs to encourage new companies into the Defence sector that may not have been traditionally interested; to create a greater pool of innovators.
- An increased focus on Australian design and development to support the development of true sovereign capability; providing Australian industry the best opportunity for creativity of design and development
- Increased early adoption of technology rather than defaulting to proven technology. It is acknowledged that this will not be possible in all cases and but there is significant opportunity in this area.

Collaboration and Capability

For the Defence industry to transform to a global innovator they cannot do it alone. To unlock true tangible benefit for Australia, Defence, industry and research must all move together to provide an environment of greater collaboration. Stronger partnerships and collaboration both internally and externally between Defence, Industry and Research is critical to meet the challenges of the future supporting the ADF.

The GREYGUM program is an example of early cooperation to deliver an urgent capability - It was able to get cutting edge new technology into the field rapidly in comparison to traditional programs. This approach should be standard practice where industry and researchers have direct contact with Defence

personnel to find out and solve their needs quickly and efficiently. This should be normal business and not just because of urgent operational need.

This concept of collaboration can be taken further by unlocking the true potential of the global world we live in through the concept of open innovation. Unlocking the power of collaboration to establish or strengthen the required skills to meet the needs of Defence is easier today than it has ever been and globally innovative companies are taking advantage of this connected world.

Greater emphasis also needs to be placed on developing Australian sovereign capability. There is a need to grow Australia's capability to design and develop, not just assemble/build another countries technology or product. Companies which are considered to be the innovative companies of today largely design or develop the service or product they provide to their customer or market. As they are in control of this development they have the flexibility associated with having this control.

Having an increased focus on indigenous capability will provide not only the best opportunities to unlock innovation but also develop export market opportunities for Australian Defence Industry. An export market for Defence would increase the national trade diversity and continue to safeguard Australia's economic prosperity.

The CAE radar is an example of innovation success but it is also a great example of the benefit of Australian Design Capability. The Defence forces have obtained a true capability advantage whilst at the same time the industry has unlocked export potential and financial benefit.

Summary

Defence can be the first customer for many exciting, new inventions. Investment in innovation helps to ensure Defence remains resilient to emerging threats, including the possible use of disruptive technologies by adversaries. It also enables us to take advantage of new or developing areas of technology that have the potential to provide a capability edge for Australia's Defence force.

To transform Australia's Defence industry into a global innovator the entire Australian Defence sector must change together. This includes adopting new attitudes towards creativity, risk, collaboration, investment (both time and money) and flexibility to create a culture which is truly conducive with innovation and collaboration. Without the establishment of this culture the innovation potential of the sector will ultimately be limited.

Remember, innovation is the process of translating creativity (an idea or invention) into something that creates value. As a result if we want to unlock true innovation we must challenge everything and not settle on the status quo.

We must do things differently, together.

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