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SADILP Concept Paper

How to return Defence to the cutting edge of technology to engage the next generation of military personnel

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Executive Summary

For the Australian Defence Force (ADF) to prevail in future conflicts in an era of unpredictability and increasingly complex systems and technology, it must embrace and adopt technology more quickly than it has ever done before. This would aid recruitment and retention of the next generation of personnel, whose innate understanding of technology would enhance operational capability and drive cultural change.

The current approach to technology acquisition has been recognised for some time as being inefficient and ineffective at delivering the right technology into the hands of the end user in a useful timeframe. Previous attempts to introduce change in the acquisition process have failed and a more grass-roots level of change is required – and this starts with culture.

A key recommendation of this paper is to introduce a culture of technology adoption within the ADF. This should be achieved in part by assessing the performance of senior officers based on how well they have embraced and encouraged technological innovation. Cultural change should also be supported by deeper stakeholder engagement with the aim of connecting end users with key technology providers to determine fast cost-effective solutions to real world problems. Improved acquisition strategies and more effective delegation of purchasing authority would also assist driving cultural change so that harnessing technology for cost-effective solutions becomes ingrained in the minds of ADF personnel.

With effective technological leadership the ADF would return to be an employer of choice that delivers cutting edge technology into the hands of the next generation, thus improving recruitment and retention. However such a cultural shift would also bring a sustainable advantage to the battlefield, and provide the ADF with improved war-fighting effectiveness. In the current era, such a shift is critical to enable the ADF to overcome adversaries who lack the same ability to quickly translate technological advances into threats to Australia's national interests.

Introduction

This SADILP Concept Paper addresses the twin aspects of technology and personnel in order to provide concrete recommendations that, if accepted, would assist in delivering a positive capability effect for the Australian Defence Force (ADF).

The paper initially defines the problem, identifies key assumptions inherent in the question, describes both the current state of technology within the ADF and the current overly bureaucratic process by which the ADF acquires technological advances, and then recommends potential solutions to the problem.

Defining the problem

For the ADF to fight and win in the era of global terrorism and extremism, regional threats to peace and security, and regional arms proliferation; it must embrace technology to aid in the recruitment and retention of the next generation of personnel. Recruiting and retaining technology-savvy personnel would enhance the ADF's ability to maximize the effectiveness of technology.

For the purposes of this paper, we define "the next generation" as 15-23 year olds, which includes both current ADF personnel and prospective recruits. Moreover, we define "cutting-edge technology" as the leading systems and products within their field and note that appropriate culture is critical to harness the effectiveness of such technology.

Assumptions

Implicit in this topic are two key assumptions: namely, "that the ADF is not currently at the cutting edge of technology" and "would cutting-edge technology actually engage the next generation of military personnel?"

The assumption that the ADF is not currently at the cutting-edge of technology is questionable. This paper will provide examples where the ADF is at the cutting-edge of technology and where there are deficiencies. This paper argues that improvements should be made to ensure greater access to cutting-edge technology, which would benefit the ADF.

A Roundtable Discussion with 20 current serving ADF members strongly challenged the implied assumption that the next generation of military personnel would be more attracted to an ADF career if the ADF acquired more cutting-edge technology.[1] This paper acknowledges that typically the next generation have been exposed to technology from an earlier age than current senior ADF members and would expect to see an equivalent or better level of technology in their workplace. Moreover, all stakeholders engaged in researching and preparing this paper agree that embracing cutting-edge technology would enhance the ADF's effectiveness and the job satisfaction and ultimately the retention of in-service personnel.

[1] The team cited the primary reasons for joining the ADF as 1) a desire to serve their country, 2) it seemed interesting, 3) perceived lifestyle, 4) the overall financial package, and 5) as a placeholder while they worked out what they really wanted to do. RAAF Edinburgh, 3 August 2015.

Current State

Technology

In a number of areas the ADF currently is, and has frequently been, at the cutting-edge of technology – evidenced by acquisition of the Air Warfare Destroyer; Special Forces combat, force protection and collection equipment; F-35A Lightning II (Joint Strike Fighter); F/A-18F Super Hornet Stand-off Coordinate Seeking Weapons (JSOW, JASSM); and the Wide Band Satellite Communications system.

In contrast there are also a significant number of examples of technology in service with the ADF that lag behind private industry including the Defence Restricted Network (which is the primary "administrative" network used by ADF, and uses an antiquated operating system[2] and suffers frequent outages which cause significant loss of productivity), Bell 206B-1 Kiowa (first delivered in 1971[3]), and the use of paper based systems. Notably in August 2015, the Chief of Air Force stated "It frustrates me that our war-fighters are not able to exploit this technology in their work environments to the same extent they do in their private lives."[4]

Capability Acquisition Process

The delivery of new projects and technology into the ADF through the standard capability acquisition process is overly bureaucratic and exceptionally slow. Delivery of most major platforms takes over ten years, which results in "new" platforms being delivered with a host of obsolete and unsupportable technology. There are, however, a number of programs outside the standard capability acquisition process within Defence to introduce technology. These programs are typically funded through the Defence Innovation Realisation Fund (DIRF). The DIRF finances the most significant Defence innovation programs: the Capability and Technology Demonstrator (CTD) program and the Rapid Prototyping, Development and Evaluation (RPDE) program.[5]

The CTD Program is managed by the Defence Science and Technology Group (DSTG)[6] and was established in 1997 to show ADF users how cutting-edge technology could be integrated quickly into existing, new, enhanced or replacement high-priority capabilities.[7] The CTD program enables industry to provide innovative solutions to address Defence priority areas.[8] This initiative enables Defence Industry to focus on the major areas where Defence has identified needs.

The RPDE program is governed by a board of participants from industry organisations chaired by the Head of Capability Systems.[9] RPDE performs two functions: Quicklooks and Tasks. Quicklooks investigate a concept and provide guidance and advice to Defence. Tasks are projects which typically

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[2] Windows XP, originally released in 2001 (http://windows.microsoft.com/en-US/windows/history#T1=era6).
[3] http://www.adf-gallery.com.au/3a17.htm.
[4] Davies, G., Chief of Air Force Opening Remarks, Jericho Innovation Seminar, Canberra, 06 August 2015, p.4.
[5] Other programs include Defence Materials Technology Centre, Diggerworks and the Priority Industry Capability Innovation Program, refer http://www.dsto.defence.gov.au/partner-with-us/innovation-integration.
[6] Formerly the Defence Science and Technology Organisation (DSTO).
[7] Australian Government, Defence and Industry Strategic Policy Statement, 1998.
[8] Defence's priority areas include future projects detailed in the Public Defence Capability Plan (DCP) and areas detailed on a DSTG website, refer http://www.dsto.defence.gov.au/partner-with-us/demonstrate-your-technology/defence-priority-areas.
[9] Within Capability Development Group, Department of Defence.

prototype or develop a proof of concept demonstrator. RPDE does not take on easy Tasks, or Tasks that a solution already exists in the market place, as such, RPDE only accepts Tasks that are high risk. The scope of the CTD and RPDE programs therefore, limit quick and easy solutions that industry could deliver to enable significant improvements to ADF military personnel.

The Department of Defence, on behalf of the ADF, is subject to the onerous Commonwealth Procurement Rules that stifle innovation. Specifically, the Commonwealth mandates that tax-payer funds must be spent responsibly, which is appropriate; however, the application of the Commonwealth's requirements is excessive. The standard requirement for competition this slows the procurement, adds cost, and often dilutes the impact of the innovation, or eliminates it completely.

Capability Acquisition and Sustainment Group (CASG) staff are institutionalised in their buying behaviour by strict rules such as multiple quotes, and inflexible Defence contracting templates,[10] which transfers risk to the supplier and disadvantages Small to Medium Enterprises (SMEs) in particular. While there is opportunity to circumvent the rules (via sole source justifications and rapid acquisitions), sole-source procurement requires willingness from the procurement team, based on a solid understanding of end user needs and a joint effort to gain approval for a non-standard spend. These elements are most often missing. A motivated end user can circumvent the application of the rules, but it is generally only worth the effort for a relatively high value activity, with a significant operational need as demonstrated by the following case study.

MH370: A case study of rapid acquisition and new technology

On 8 March 2014, Malaysia Airlines MH370 disappeared while en route from Kuala Lumpur to Beijing. The initial search area was a 60,000 square kilometre arc that extended along a north easterly direction off the West Australian coast. Aircraft constituted the bulk of the rapid response search team of international partners. To help with data for the search, the Australian Maritime Safety Authority (AMSA) provided a self-locating datum buoy which can be deployed from transport aircraft. However, Defence requires a special approval, known as a stores clearance, to deploy the buoy from the AP-3C Orion aircraft.

Air Force was tasked to clear the buoys for release from the AP-3C as a priority. A team of Air Force, APS and contractors from electronic and structural trades came together to clear the store within 30 hours. This activity normally takes months, which demonstrates that with Command commitment, allocation of resources, and a positive culture, bureaucracy can be overcome without compromising safety.

People and Culture

Part of the ADF's culture is a can-do attitude to problem solving. This attitude along with years of slow technology adoption and bureaucratic process has made it difficult for military personnel at the "working" level to embrace technology. This results in a culture that accepts the status quo rather than embracing a culture of technology adoption. While the 2013 Defence White Paper recognises competition in the labour market, and the need for the ADF to be an employer of choice to secure the highest calibre workforce and deliver the capability planned, the link between this valued workforce and technology adoption is not well promoted. At present, technology is not well marketed to potential recruits of all three Services. Further, there is no requirement for these

[10] Australian Standard for Defence Contracting (ASDEFCON).

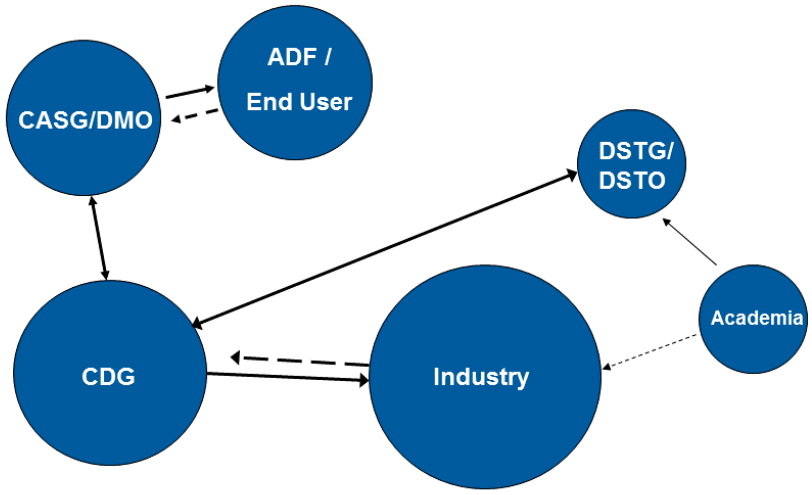
recruits to have experience – or even interest – in technology or enabling activities such as communication and information systems, big data management, or robotics.

Further, there are currently no performance objectives regarding technology for ADF senior leaders and ADF unit commanders which, we believe, stifles the introduction of a culture of technology adoption and innovation. Hence, changing the status quo is critical if the ADF is to truly engage the next generation of prospective military personnel who are more tech savvy than their predecessors and have high expectations regarding the use of technology in the workplace. Further, the rate of technology change is increasing, and this pattern is expected to continue into the future[11], which further reinforces the need to improve the culture of technology adoption within the ADF to ensure retention of the highest calibre workforce.

Stakeholder Engagement

The CASG procurement team is remote from both DSTG and the end user, and often end user needs are not clearly understood by CASG. This situation is especially true at the lower ranks across the services, and end user engagement with the procurement team and industry alike is often limited. Moreover, stakeholder engagement is currently not targeted towards future outcomes regarding the introduction of cutting edge technology. In most instances, cutting edge technology currently resides at the industry or academic level. This situation presents challenges for Defence on how to engage these stakeholders regarding technology that shows potential.

The Defence Capability Development Handbook, written by the former Capability Development Group provides a guide on how to engage stakeholders. In this document, Industry has only limited and very formal engagement with the ADF before the first pass approval stage, by which time much of the project scope has been defined. Academia is not mentioned, but should be afforded a higher priority focus, especially regarding conferences and engagement with DSTG. Such engagement should be used for innovation; however, it should also used for life cycle costs and acquisition strategy. The diagram below depicts current stakeholder engagement:



[11] Transitioning to Workforce 2020 – Anticipating and managing the changes that will radically transform working life in the next decade, Cisco, 2011.

Analysis

Technology

Incorporating cutting edge technology into projects comes with an associated risk. Defence is risk averse and prefers “proven products” and “existing designs” or “modified off the shelf” designs. This conservative approach further exacerbates the obsolescence of delivered products. Hence, a careful gate-structured approach to delivery technology projects would help manage the risk of high technology and complex acquisitions.

The ADF requires greater collaboration with industry to expedite technology introduction with appropriate risk management. Industry has developed considerable advancements in technology – in particular communication technology and big data management – that would significantly benefit the ADF.

Capability Acquisition Process

The First Principles Review (FPR) identified that the current capability acquisition process is a critical deficiency; however, the FPR has not yet delivered a solution to this chronic issue. This paper argues that the standard capability acquisition process should also allow for lean acquisition when technological advancements would deliver an immediate capability enhancement for the ADF, and this should be driven by ADF unit commanders (refer below).

People & Culture

In order to engage the next generation of military personnel, the ADF should embrace current and emerging technology across all five war fighting domains – Sea, Air, Land, Cyber and Space. Technology adoption must focus not just on platforms, but employing commercially available technology to assist in operations – for example use of iPads for distribution of operational data. The ADF must make technology adoption a measurable and quantifiable annual performance objective of senior leaders (ADF unit Commanders and above) which would eventually cascade through Defence. The objective should be the implementation of a number of initiatives to employ commercially available technology to drive efficiencies into the everyday life of ADF personnel. For example, the use of iPads to distribute operational information to the ADF, which would save both time and resources. Such initiatives should then be communicated to the ADF members via a simple “best practice portal”, which would serve to engage both the current and next generation of ADF personnel.

Once embedded, the culture of technology adoption would enable high performing teams across Defence to be more agile and adaptable; and create a more efficient ADF. Such a culture would be appealing to potential recruits, would aid retention, and reinforce the concept that ADF unit Commanders are the champions of technology adoption for the ADF. Such a culture would reduce the possibility of a “dinosaur” manager and savvy “end user”. Defence Force Recruiting and media should also use such themes in engagement and recruitment material to attract the next generation of military personnel.

Implementing a “culture of technology adoption” within the ADF would increase appeal to the next generation who are considering an ADF career, while simultaneously enhancing the ADF’s fighting capability. To be effective, such an initiative should be led from the top down. The Chief of Air Force

agrees and has stated that the "Defence is simply not innovative enough".[12] Such an initiative would also create agile mental attitudes that are able to adapt quickly to changes, which is critical given the increasingly complex and dynamic operational environment.

Stakeholder Engagement

There is significant opportunity for increased collaboration between DSTG, Industry and ADF end users which would result in greater innovation to address key ADF requirements in a more efficient and effective manner. Establishment of an Innovation Standing Offer Panel would enable a group of trusted suppliers to benefit from a limited competition arrangement.[13] Such an initiative would need to have approved pricing and contracting methodologies, and a collaborative approach to commercialize innovation around risk transfer and Intellectual Property ownership.

Industry is continually frustrated by the lack of interface to the end user and would benefit from regular capability forums attended by all stakeholders – Industry, DSTG and the ADF end user. Such forums would need to be driven by requirements and desired enhancements to current capability articulated by ADF end users and endorsed by a relevant authority such as Head Joint Capability Coordination (HJCC).[14] Ideally, such forums would be used as an unconstrained think-tank and provide responses to HJCC on whether the goal is technically possible, the Rough Order of Magnitude cost of implementation, and whether the expense is justified.

Recommendations

Three key realistic, achievable and cost-effective means to return Defence to the cutting-edge of technology to engage the next generation of military personnel are to enable:

1. A Culture of Technology Adoption – we believe the ADF must embrace a culture of technology adoption, and must do so urgently to ensure the ADF engage the highest calibre of workforce in the future. This should be achieved by i) making technology adoption a qualitative performance objective of ADF senior leadership, which would serve to enhance the team's awareness and adoption of accessible technological advancements, ii) providing local discretion to make technology purchases to a predetermined value or risk profile to meet operational needs employing commercially available technology, and iii) encourage technology adoption by sharing best practice across the ADF – through a simple portal.

2. Greater stakeholder engagement - Defence should sponsor regular technology conferences where designated representatives of each ADF capability brick would articulate priority operational problems to an audience of potential solution providers, and enable a subsequent two way conversation to generate possible solutions for further analysis. DSTG should be more central to Defence business vice an outrider for most Defence enterprises. In particular, DSTG should be more aligned to Defence requirements, especially the end users. This could be easily achieved through a placement program: whereby DSTG innovators are seconded to various Service teams for a defined period. Under this construct, the DSTG innovators would shadow

[12] Davies, G., Chief of Air Force Opening Remarks, Jericho Innovation Seminar, Canberra, 6 August 2015, p.2.

[13] For example, a sole source opportunity for delivery of innovations that they have designed.

[14] Two star ranking officer within the Vice Chief of Defence Force Group.

ADF end users on a daily basis to enhance their understanding of operational challenges and end user needs, which would focus DSTG efforts to enable operational outcomes.

3. Empowered Acquisition - Commanders should be empowered to embrace technology developments via a simple (vice the current bureaucratic) acquisition process. Such a change requires emphasis on enhanced stakeholder collaboration, where technology groups and Defence Industry liaise with designated ADF representatives who are empowered to sponsor technology disciplines in order to ensure correct prioritisation of effort. These representatives must possess an appropriate sphere of influence, sufficient resources and delegated responsibility to represent the end user.

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