

Strategic management of the Defence S&T Portfolio: Are we there yet?

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Abstract

This paper studies an exemplary case of strategy implementation in the Defence Science and Technology Group (DST), a group within the Australian Government Department of Defence. Through three action research cycles between 2016 and 2018, the study has found that DST progressed from an organisation where it was considered difficult to demonstrate strategic alignment of its work to Defence needs to an organisation that manages its portfolio strategically. The lessons for other organisations is to manage improvements in the investment allocation process not so much through the introduction of new tools but as a change management project driven through top management support. A technical lesson is that decision-making about budgets needs to be at the level at which strategy is implemented, that is at a program rather than at a project level. Further research is recommended within Defence and other organisations to evaluate whether strategic benefits can be realised if resources are allocated strategically.

Keywords: *Strategy implementation, project program portfolio management, resource allocation*

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1 Introduction

1.1 Difficulty ensuring resources are strategically aligned

Research studying organisational performance over long periods has found little evidence that strategy is being implemented and goals realised (Kiechell, 2010). Research in the public sector has found that projects contribute little to strategy (Young *et al.*, 2012; Young and Grant, 2015). Like any large organisation, Defence needs to ensure its resources are focussed on delivering its strategic goals, articulated in the 2016 Defence White Paper (Department of Defence, 2016).

One difficulty is that large organisations have a tendency to be bureaucratic and unable to respond to turbulent environments and emergent conditions. Defence historically was organised around traditional army, navy and air force structures with independent chains of command. In 1976, the government made a strategic change and established the ADF to place the services under a single headquarters. In 2016, a review of Defence from first principles took this one step further and concluded “that a holistic, fully integrated One Defence system is essential if Defence is to deliver on its mission in the most effective and efficient way” (FPR, 2016, p. 7). This First Principles Review has been quite influential with a recommendation that “implementation of the changes required to deliver One Defence is in place in two years [2018]” (FPR, 2016, p. 7).

1.2 Size of the Defence Portfolio

The Australian Government allocated A\$34.7 billion to the Australian Defence Organisation in the 2017–18 financial year. This level of expenditure is equivalent to approximately 1.9% of Australian Gross Domestic Product (GDP) and 7.28% of total Australian Government

expenditure. In terms of people, Defence consists of approximately 60,000 staff in the ADF permanent force and 18,000 civilian staff in the Department of Defence. It is one of the largest organisations in Australia. Within that, DST manages a Portfolio consisting of 2100 civilian staff and a total budget of approximately \$450 million.

1.3 DST: a Group within Defence

This paper will present an action-research study of one organisational unit, DST, within Defence and evaluate progress in aligning resources towards Defence's strategic goals. DST is an exemplar organisation that provides scientific services to all areas of Defence.

In 2015 DST received an audit recommendation to improve its resource allocation processes because "it is difficult ... to demonstrate ... the extent to which its portfolio of work aligns with Defence's strategic priorities" (ANAO, 2015, p. 10). DST formally satisfied this recommendation by developing and implementing innovative processes to allocate resources strategically and is starting to be recognised for this within Defence. The lessons learned may apply to any large organisation trying to improve its effectiveness in implementing strategy.

The paper firstly presents the methodology followed to study how to implement strategy, then presents a case study of three action research cycles within DST, and finishes with some reflections and a conclusion.

2 Methodology

An action research methodology was adopted because DST has a practical problem that needs a solution which may be better delivered by trialling or testing the viability of the approach rather than by theoretically based academic research (Brydon-Miller, Greenwood and Maguire, 2003). More specifically the action based research methodology is appropriate as it allows for theory to emerge as the intervention is adapted to the specific context of the issue to be addressed and as the participants reflect on their theories-in-use (Schön, 1983; Eden and Huxham, 1996).

The action research was informed by the designs applied by Middel et al. (2005) and Coughlan & Fergus (2009) and one or more cycles in what is known as a "hermeneutic spiral" were used to clarify understanding and generate theory (Gummesson, 1991). Each cycle consisted of four overlapping stages: plan, act, observe, and reflect. The research is ongoing and started two years ago in 2016 with the lead academic researcher on site for up to two to three days per week. This paper reports on the intervention after three action research cycles from 2016 - 2018.

3 Case Study

3.1 Background

DST provides scientific advice and innovative technologies to meet Australia's Defence and National Security challenges. DST is part of the Department of Defence and is Australia's second largest publicly funded research organisation. DST is organised into seven research divisions and three enabling divisions. Within the research divisions there are 37 Major Science and Technology Capability (MSTC) areas that have been developed to deliver

outcomes against Defence and National Security strategies. DST predominantly delivers outcomes across five Defence domains (Maritime, Land, Aerospace, Joint and Intelligence) and one broader National Security domain.

DST Group provides value to Australia's defence and national security through its capacity to reduce and mitigate strategic and operational risks and to create and maintain a capability edge (DST, 2016). However, while DST has successfully delivered high value outcomes to Defence it has needed to improve the way it strategically manages its Portfolio which was highlighted in a recent recommendation made by the 2016 Defence First Principles review which stated that DST "be required to clearly articulate its value proposition". The Australian National Audit Office (ANAO) undertook an independent performance audit into DST's management of science and technology work for Defence. The audit found that DST had begun a process of implementing initiatives for improving the effectiveness of program planning through its strategic plan. It recommended DST build on these to more effectively manage at a more strategic level.

DST responded to these reviews by introducing a new Project, Program and Portfolio Management (P3M) framework and investment process to better align the resources available within its Portfolio with Defence strategic priorities. Table 1 summarises three action research cycles DST have undertaken to date to manage its portfolio more strategically.

3.2 2015 – 2016 Action Research Cycle 1

DST makes considerable effort to liaise with each of the Defence and National Security client domains through direct engagement by its science and engineering workforce as well through scientific advisers assigned to each major area within Defence. DST identified areas of work in consultation with clients using primarily a bottom-up process consisting of gathering detailed

client requirements (over 1,200 in total from the Defence Groups and Services). The large number of client requirements and the bottom up process of resource allocation made it difficult to agree the overall priorities across multiple Defence stakeholders.

In the first action research cycle, a new investment process was initiated to try to raise the level of abstraction for decision making from 1,200 client requirements to 37 MSTCs. The 37 MSTCs were allowed to make up to five bids for funding to either develop and sustain the capability or deliver to the client domains. Decision-makers initially considered and ranked around 170 proposals aiming to address the 1,200 client requirements. However, when the bids were consolidated at the MSTC level it became difficult to easily resolve the investment needed to develop S&T capability from that needed for delivery to the client. In addition, the bids considered only funding and did not attempt to prioritise staff effort.

3.3 2016 – 2017 Action Research Cycle 2

The investment process was refined and a Portfolio, Program and Project (P3M) approach was introduced as the means to provide a hierarchical structure for investment decision-making. This meant that priorities were first decided at the Portfolio and Program level before undertaking individual project prioritisation within a Program. The Portfolio was divided into five streams that separated investment into the MSTC capability, direct delivery to Defence domains, long-range strategic research as well as enabling functions covering policy, strategy and research services. This approach now provided a framework that enabled decision-makers to prioritise internal funding to maintain S&T capabilities (MSTCs) separately from client requirements. The net result was that a smaller number of project-level business case proposals were considered in separate steps and a more strategic overview was provided for senior decision makers. Each project-level business case aggregated a number of related client requirements and was presented using an Investment Logic Map (ILM) that clearly captured

the value proposition of each project (Victorian Department of Treasury and Finance, 2017).

In the first iteration of this process only three of the five streams were considered:

- A single business case was produced to identify the raise, train and sustainment needs for each MSTC (37 capabilities in total);
- One business case for each investment in the two programs that comprise the strategic research stream (21 in total); and
- A total of 61 business cases covering the client domains (Maritime, Land, Aerospace, Joint, Intelligence and National Security).

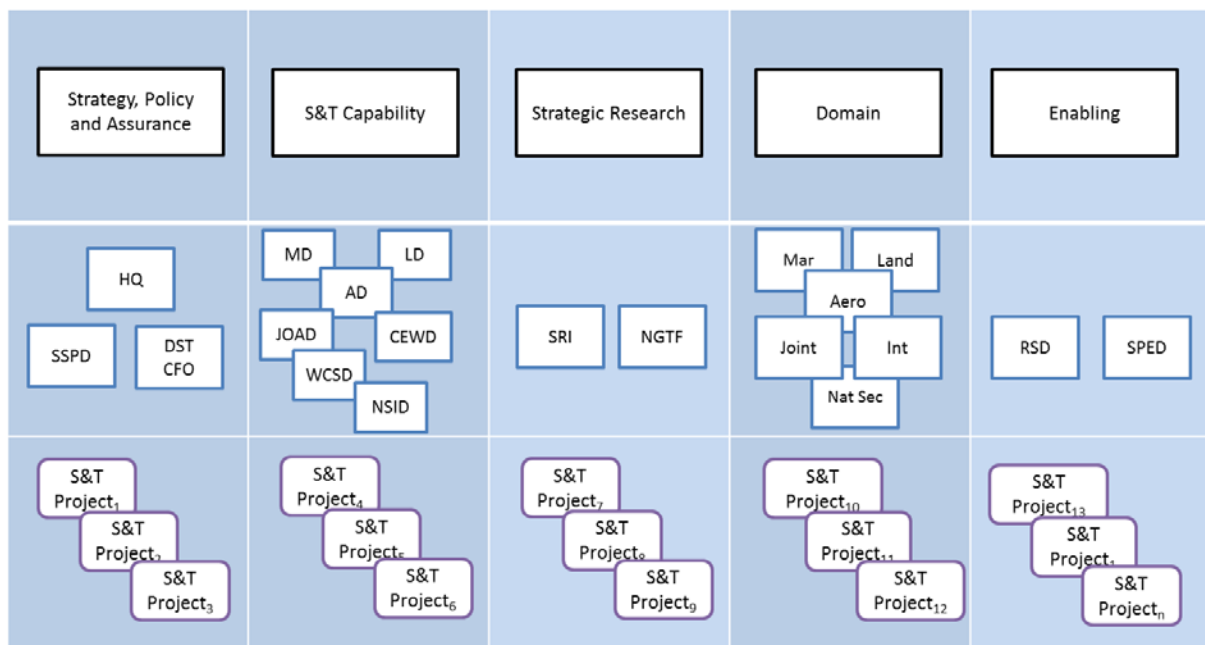


Figure 1: DST P3M Framework.

The investment process included a series of reviews that considered the projects related to a given Program within the P3M framework. The reviews consisted of panels made up of DST leadership and one-star and two-star Defence stakeholders. Defence panel members commented favourably on the high level of visibility provided by the new process and they

were able to advise DST managers where to decrease work on some projects and increase work in others. In this iteration, a maximum change of 5% funding for each project was considered, as staff were still transitioning from planning by client requirements to stating project-based business cases using ILMs. One notable outcome occurred when a Defence stakeholder identified an opportunity to share a major Defence asset which would create a large cost saving in delivering a particular program.

However, the P3M process was undermined to some degree because it was not fully aligned with the budgeting process. Not all of the projects that required funding were captured in the first iteration and it was later identified that additional funding was required to fund projects that were agreed outside of the investment process. The result was that the total commitment now exceeded the available budget and every business unit had to accept a cut in their budget even when the P3M process had identified projects where the budget should be increased.

3.4 2017 – 2018 Action Research Cycle 3

By 2018, the P3M process was now accepted across the entire organisation. A decision was made to undertake the agreed investment process across all of the five streams within the Portfolio. DST senior management and finance managers made a commitment to ensure that all investment decision-making would be captured using the investment process to ensure that the process could prioritise the entire Portfolio budget. Despite the success of the investment process in allocating funds to projects within a given program, it was decided that there needed to be a mechanism to more strongly instil a culture of prioritisation and re-allocate funding more broadly across the Portfolio streams and programs. To respond to this need a modified zero-based budgeting (ZBB) step was now introduced where 15% of the funding was removed from every program. These funds were then reallocated to the highest priority projects and programs across the entire Portfolio, as identified by the priorities from each individual

investment review. Program leaders were given the authority to reallocate the remaining funds within their program to the projects with the highest strategic priority. This step reinforced the role of the Program manager, who now had to make difficult strategic investment decisions that they had to negotiate with their stakeholders. One-star and two-star Defence stakeholders saw the strategic nature of the decision-making and commented that the DST process provided a structured and efficient approach to the reallocation of resources across the streams within the P3M framework.

A weakness of this process was that it was not able to easily reallocate staff resources to the area of highest strategic need in the same way as funds. The re-allocation of staff is inherently more difficult as the skillsets of available staff may not be readily applied to priority delivery areas without an additional investment in recruitment or re-skilling (to develop new or increase capacity in S&T capabilities). Defence outcomes in these priority areas may therefore not be realised in the short term, despite additional funding available to them. Consideration of staff reallocation will be undertaken in the next iteration of the investment process along with a stronger link between workforce planning and investment decision outcomes.

Planning is now starting to focus on institutionalising the P3M processes by upgrading project management software and management information systems. This will require further change to the way DST conducts its business and will need additional skills to be developed through tailored training in program and project management.

Table 1: Summary of Action Research

	2015-16	2016-17	2017-18
Overview	Attempted to prioritise 1,200 client requirements. Requirements formed the basis of work allocation and reporting.	Project level investment: consolidated client requests into 120 projects for prioritisation – Defence clients saw a strategic view for the first time	Zero based budgeting with balancing at program & portfolio level – Defence clients provided positive feedback on the investment process
Key Details	First Principles Review, and recommendations from ANAO report. 1,200 client requirements	Research delivery business units only 119 projects (ILM) / 3 out of 5 Portfolio streams: Up to 17 projects assessed in each program Investment adjusted ±5% @project level	All business units 130 projects (ILM) / All 5 streams Zero based budget -15% @program level
People	Senior Management introduced a change initiative to engage Defence more strategically. PROSCI change management training	Stakeholder roadshows: many P3M presentations and extensive consultation Program Office gave feedback to improve ILM & presentations	Program management introduced (but role not clarified)
Perspective	P3M introduced within Defence S&T Program Office. Domain S&T Strategies developed with client. Investment process introduced to prioritise MSTCs	Investment was first decided at the Portfolio and Program level before undertaking Project prioritisation within a Program Senior management: (re)allocation of funding to highest priority projects within a program Entire budget not considered	Program and Portfolio level budgeting Senior management: explicit (re)allocation of funding to program with highest strategic priority Staff were not prioritised
Tools	ILM train-the-trainer delivered.	Extensive ILM training	New project management tools and information systems to be introduced

4 Reflection and Generalisation

DST is an interesting case study because it provides a context not too dissimilar to the Manhattan Project and the origins of modern day project management. DST scientists like the Manhattan Project scientists are not generally interested in project management as a discipline. It is interesting to reflect on how much of the project management body of knowledge that has developed over the past eighty years should have been taught at Los Alamos if it were possible. Lenfle & Loch (2010) suggest the answer is very little because project management has come to emphasize control over the flexibility and novelty needed for the Manhattan Project. In DST's case, the need is not so much new tools to control processes, but to demonstrate alignment of effort with Defence's strategy and delivery of value.

Another insight is had by reflecting on the DST corporate initiative to introduce improved investment management and client focus. It has been quite successful to date but this result is much more than a case of introducing a P3M framework and standard business case formats through investment logic maps. The recommendations from a recent audit (ANAO, 2015) and the change in strategic direction within Defence (FPR, 2016) provided the catalyst for action and the success of the initiative was due in large part to the strong support of top management to address these issues. Top management realised that if the situation was untreated there was an unacceptable risk that DST could lose support from its Defence stakeholders and fail to deliver its full potential in meeting the strategic goals of Defence. This case is an example of successful change management and it suggests success for P3M initiatives is heavily dependent on ongoing top management support for strategic investment process changes. Extensive consultation is necessary and staff at all levels within the organisation have to be supported as they make fundamental changes to their existing business practices.

A lesson that was learnt through the three action research cycles is that funding needs to be allocated at the level where the strategic decisions need to be made. Initially decisions were

made to prioritise 1,200 client requirements. Then decisions were made to prioritise projects and finally decisions were made to prioritise at the portfolio and program level. DST took a relatively cautious approach by lifting the level of decision making to a more strategic level as they gained experience. In addition, the amount of funding that was re-allocated was also increased. Initially a change of only 5% in funding was considered at the project level but then the process moved to the modified zero-based budgeting approach which removed 15% of the budget from each program. The impact of this cut at the program level and the empowerment of the program managers to reallocate project funding within their programs had the greatest impact in aligning the Portfolio towards the highest value areas for Defence.

5 Future Research

The title of this paper asks “are we there yet?” In the case of DST, it is probably one to two action research cycles away from where it needs to be. Budget was prioritised in the last cycle, and staff also need to be allocated to the most strategic capabilities to have assurance that the desired outcomes, articulated at the strategic level of the Defence White Paper (Department of Defence, 2016), are being realised.

Further research within DST is recommended to study whether the strategic allocation of resources leads to an improvement in achieving superior Defence capabilities. This research should contribute to the benefits management literature as well as the portfolio management literature.

Further research should also be conducted within other Defence organisations. It takes more than DST’s S&T to have superior capabilities; it needs to be embedded and operationalised within Defence as a whole because the desired outcome is a Defence capability rather than a DST capability. Further research should also be conducted within other organisations in

general. The issue being studied in this action research is how to implement strategy and realise strategic goals (Kiechell, 2010; Young and Grant, 2015). DST has shown one promising way forward, perhaps the lessons can be transferred to other organisations outside the Defence context.

6 Conclusion

There is little evidence that organisational strategies are implemented effectively (Kiechell, 2010) and the public sector has been found to be particularly ineffective (Young and Grant, 2015). This paper studies the implementation of strategy between 2016 – 2018 in DST, a group within Defence.

Through three action research cycles, the study has found that it is possible to go from an organisation where it was considered difficult to demonstrate the extent to which its work contributes to strategic priorities to an organisation that manages its portfolio strategically. The lessons for other organisations is to manage improvements in the investment allocation process not so much through the introduction of new tools, but as a change management project driven through top management support. A technical lesson is that decision-making about budgets allocation needs to be at the level at which strategy is implemented, that is at a program rather than at a project level.

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7 References

ANAO (2015) *Report No. 19 Performance Audit Managing Science and Technology Work for Defence - Defence Science and Technology Group*.

Brydon-Miller, M., Greenwood, D. and Maguire, P. (2003) 'Why action research?', *Action research*, 1(1), pp. 9–28.

Coughlan, P. and Fergus, M. A. (2009) 'Defining the path to value innovation.', *International Journal of Manufacturing Technology and Management*, 16(3), pp. 234–249.

Department of Defence (2016) *2016 Defence White Paper*. Available at: <http://www.defence.gov.au/whitepaper/> (Accessed: 30 May 2017).

DST (2016) *DST Strategic Plan 2013-2018 (2016 update)*. Available at: <https://www.dst.defence.gov.au/publication/dst-strategic-plan-2013-2018> (Accessed: 19 July 2018).

Eden, C. and Huxham, C. (1996) 'Action research for management research.', *British Journal of Management*, 7(1), pp. 75–86.

FPR (2016) *First Principles Review: Creating One Defence*. Canberra. Available at: <http://www.defence.gov.au/publications/reviews/firstprinciples/Docs/FirstPrinciplesReview.pdf> (Accessed: 26 June 2018).

Gummesson, E. (1991) *Qualitative Methods in Management Research*. Newbury Park, CA.: Sage Publications.

Kiechell, W. (2010) *The Lords of Strategy*. Boston: Harvard Business Press.

Middel, R. et al. (2005) 'Action research in collaborative improvement.', *International Journal of Technology Management*, 33(1), pp. 67–91.

Schön, D. A. (1983) *The reflective practitioner: how professionals think in action*. London: Temple Smith.

Victorian Department of Treasury and Finance (2017) *Investment management standard version 5*. Available at: <http://www.dtf.vic.gov.au/Publications/Investment-planning-and-evaluation-publications/Investment-management/Investment-management-standard-version-5> (Accessed: 23 February 2017).

Young, R. et al. (2012) 'Is strategy being implemented through projects? Contrary evidence from a leader in New Public Management', *International Journal of Project Management*. Elsevier Ltd. APM and IPMA, 30(8), pp. 887–900. doi: 10.1016/j.ijproman.2012.03.003.

Young, R. and Grant, J. (2015) 'Is strategy implemented by projects? Disturbing evidence in the State of NSW', *International Journal of Project Management*. Elsevier Ltd and International Project Management Association, 33(1), pp. 15–28. doi: 10.1016/j.ijproman.2014.03.010.