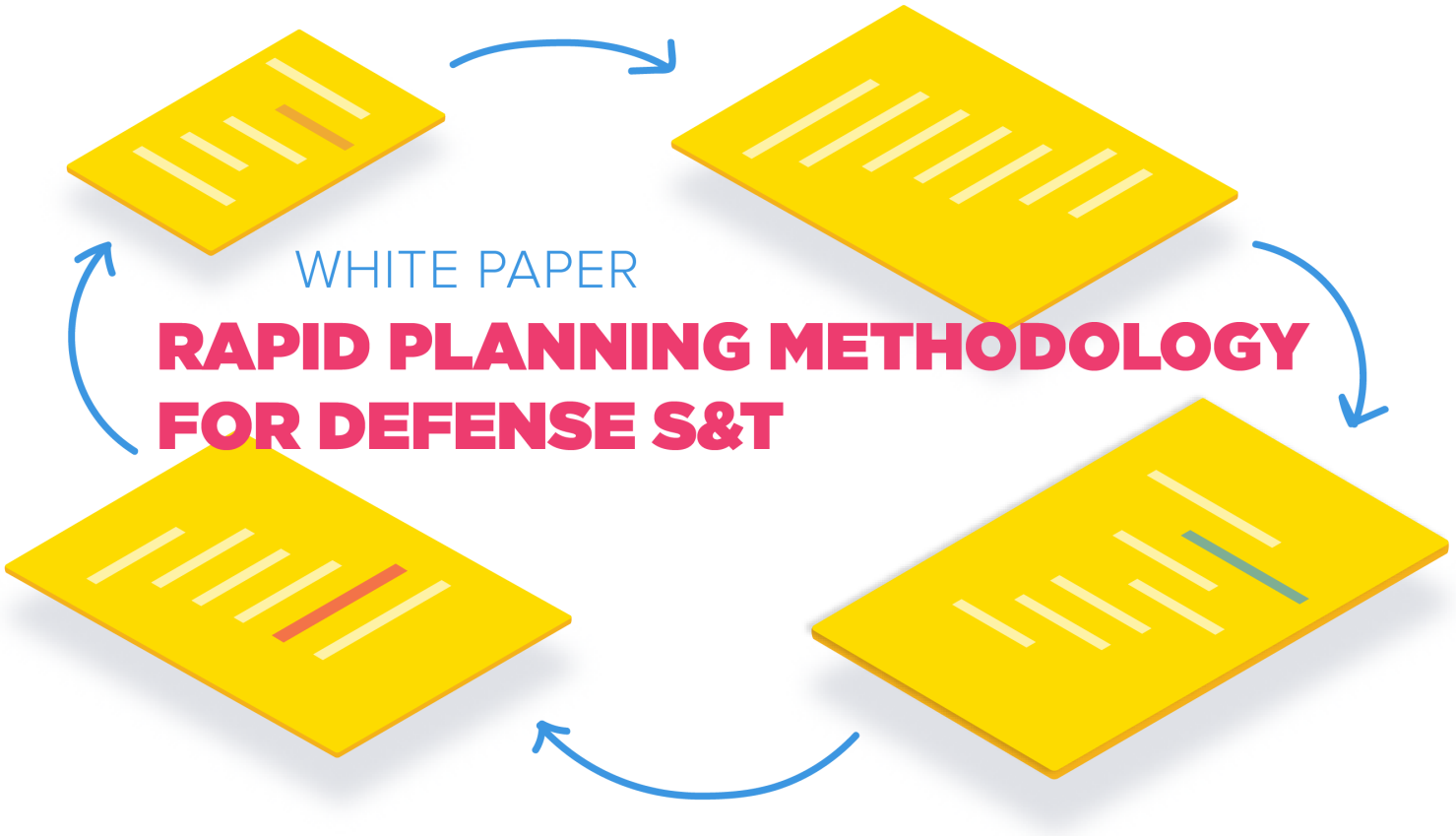
DECISION LENS
Accelerate



WHITE PAPER

RAPID PLANNING METHODOLOGY FOR DEFENSE S&T

S&T organizations are using 20th century frameworks to manage 21st century innovation which is resulting in an erosion of American military superiority. This white paper describes a methodology and solution for the United States Department of Defense (DoD) to:

- Alleviate the relatively slow pace at which new technologies reach our war-fighters Challenges bringing the latest available data together to assess what it means
- Enable undeveloped or underdeveloped technologies to be pursued by DoD organizations who did not originate the technology
- Improve the efficiency and cost-effectiveness with which S&T programs are developed and executed

The Decision Lens' Technology Shelf is a methodology and solution designed to help the DoD organize its most critical technologies into one system. The Technology Shelf was developed to supersede the manual processes that characterize most of DoD S&T, from initiation and development of S&T concepts through evaluation and down-selecting to the S&T investments that offer the most promise, and ultimately to increasing the throughput and execution so that more high impact S&T capabilities can be developed within the same or a reduced resourcing envelope. This will enable the Joint Force to readily choose to pursue and collaborate on projects that will allow capabilities to reach our war-fighters in a cost-effective and accelerated fashion.

BACKGROUND

"It's tough to make predictions, especially about the future"

–Yogi Berra

As the U.S. emerges from a "period of strategic atrophy," our competitive military advantages are at risk from the onset of agile, dynamic and persistent adversaries. These adversaries are focused on creating instabilities in regions around the world where the U.S. once relied on its military advantages to instill economic, diplomatic and security permanency. While this erosion is prevalent, the National Defense Strategy (NDS) identifies a need for "a more lethal, resilient, and rapidly innovating Joint Force." At the foundation of this need lies the U.S. military's requirement to rapidly disperse technologies in a manner that not only matches but exceeds the pace of our adversary's strategic assaults.

This white paper offers a "Technology Shelf" in support of U.S. military readiness to restore our strategic advantages. The Technology Shelf is designed to automate disjointed and antiquated processes for expediting Science & Technology (S&T) investments across the Joint Force. Through collaboration, technology sharing, cost-sharing and shared gap analysis the Technology Shelf will alleviate slow S&T processes, static planning and duplication of efforts across the DoD and our partners and allies.

In the following sections we describe how to enable S&T planners to rapidly stand up a Technology Shelf. Using this solution permits planners to effectively manage submissions, conduct collaborative evaluations, perform numerous resource allocation "what-if" scenarios, execute on-going performance tracking and transition to accelerate and improve innovation processes to ensure capabilities reach our war-fighters before they are obsolete.

S&T DEFICIENCIES – A 20TH CENTURY FRAMEWORK APPLIED TO MANAGE 21ST CENTURY INNOVATION

S&T processes are both failing to meet the objectives outlined by the national defense strategy and are consuming more and more resources in doing so. There is a greater need for speed and efficiency today because of the multitude and differing types of threats. The need for speed drives a short-term approach towards how to close capability gaps which puts pressure on S&T organizations to rapidly ideate, down-select, and execute.

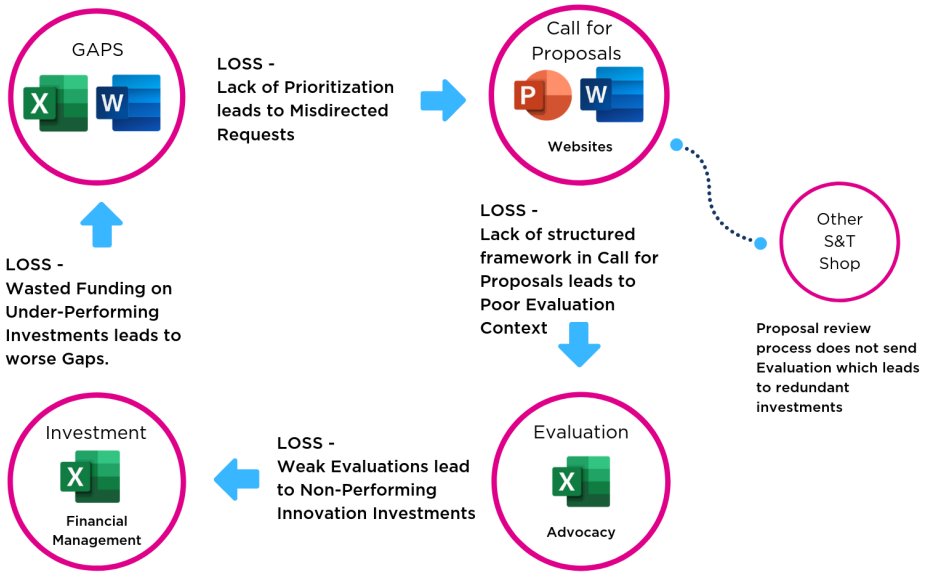


Figure 1: S&T Process Deficiencies

As is shown in Figure 1, today's S&T process for developing and executing innovation uses insufficient 20th century approaches in the following ways:

“The journey of 1000 miles begins with a single step”

–Lao Tzu

- Capability gaps are addressed through manual ideation and concept development, but a lack of strategic alignment and prioritization for the most important gaps leads to misdirected requests
- These misdirected requests are fed into a Broad Area Announcement (BAA) that lacks structure and so leads to poor evaluation context. The lack of priorities and strategic alignment causes evaluators to adjudicate over “advocacy based” decision processes
- In execution of the S&T programs, the initial weak evaluations lead to non-performing S&T investments and a waste of resources
- The evaluations from the BAA are not shared with other S&T shops, leading to massive redundancy of both requests and evaluations
- Wasted resources on under-performing investments leads to worse gaps and the cycle continues

S&T programs must balance priorities with cost and risk considerations to execute the mission and achieve S&T and organizational goals. Changes in resource availability and shifts in priorities can suddenly occur and destabilize the planning process. This directly impacts the performance of the program and the ability to achieve the highest levels of readiness.

Most often, program planning information is contained in manual spreadsheets making it difficult to rapidly anticipate and change in order to accommodate disruptors or new information in the planning process. These manual processes generally lack algorithms and optimization capabilities that would enable S&T planners to rapidly explore multiple executional pathways to get to outcomes faster and at improved performance levels. The entire process runs on a series of disconnected tools using a combination of email, Word Documents, PowerPoint, Share Point, Excel, databases and various financial systems. Planners struggle with data quality and providing timely insights to senior leaders to help inform and justify critical trade-off decisions. This disjointed framework results in S&T program planners revisiting very similar investments year after year but without the benefit of a picture of the history of evaluation. The evaluation process is largely reconstructed each year from the ground up.

A TECHNOLOGY SHELF FOR S&T

The Technology Shelf concept is a software-enabled planning solution that transforms the above disparate and poorly performing innovation stages into a high-performance, rigorous and collaborative approach to S&T innovation.

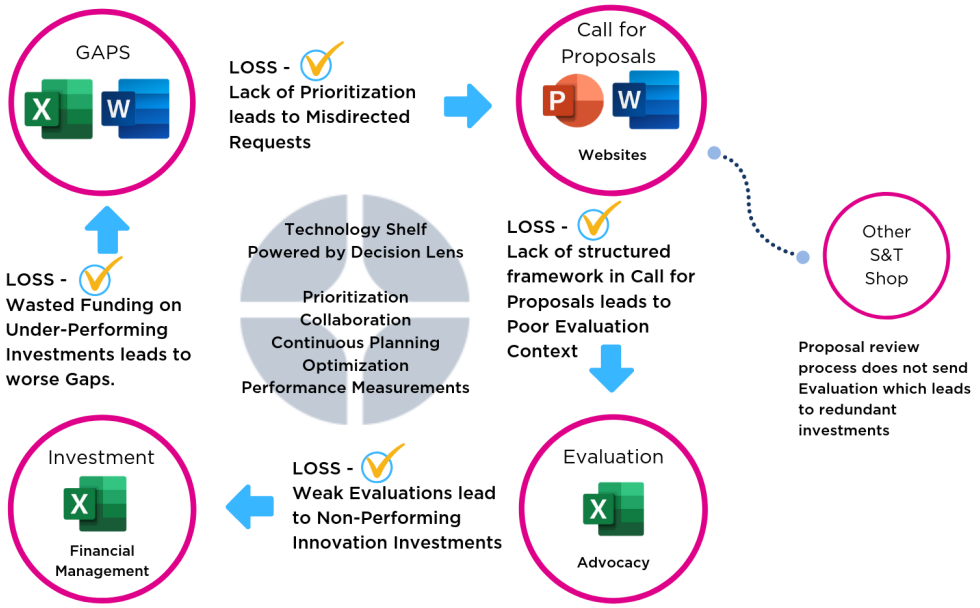


Figure 2: Technology Shelf Implementation

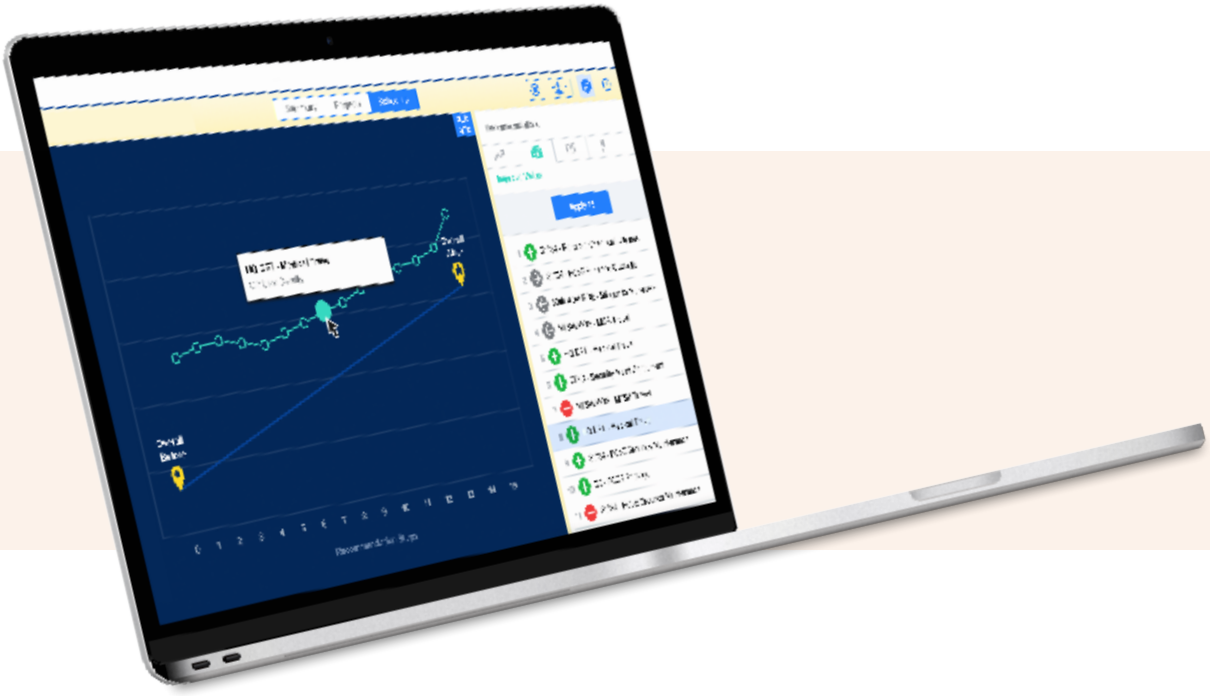
The Technology Shelf addresses the process deficiencies by providing a single-source system and repository which enables:

- Identification and prioritization of capability gaps, leading to innovation requests that are directly aligned with strategic priorities
- A structured framework for the evaluation of proposals in alignment with strategic priorities and major gaps identified, providing a rigorous framework for Calls for Proposals/BAA evaluation with context, and a more rapid process based on a common S&T evaluation methodology
- The ability to collaboratively evaluate S&T proposals and allocate S&T resources, and to share the evaluation findings broadly across all S&T organizations for future use
- A directed set of investments that make the best use of both funding and headcount resources for improved capability outcomes and less redundancy, inefficiency, and re-work.
- Capability gaps are closed expeditiously, leading to higher performance towards mission objectives and more resource availability for future investment.

The Technology Shelf is used for continuously evaluating and sharing information about S&T investments across portfolios all within a single unified platform. Through the implementation of a Technology Shelf, S&T planners become more effective at soliciting, evaluating, collaborating, developing innovative prototypes, and then tracking them over their life cycle to systematically bring a product from MVP to the field for integration with the war-fighter.

The Decision Lens Technology Shelf enables S&T planners and program managers to get their arms around the data for planning purposes and sufficiently explore the options and implications to enable faster and more executable planning processes. Understanding the various trade-offs and communicating the implications quickly often requires more time and iterations than are available or possible so oftentimes the first answer becomes the best answer. Charting a smarter course of action in response to change is critical to success.

A Technology Shelf acts as a foundation for integrated planning, enabling S&T planners to organize information from multiple sources, perform analysis and connect what were previously disjointed processes. It helps resolve the NDS objective to "establish an unmatched twenty-first century National Security Innovation Base that effectively supports Department operations and sustains security and solvency." By automating S&T decision-making and data management processes, planners are able to spend more time focusing on higher-level analysis and insights versus spending time inefficiently on basic data management functions. Additionally, it will provide the U.S. military the agility it seeks in rapidly resolving capability gaps for our war-fighters at the speed of relevance.



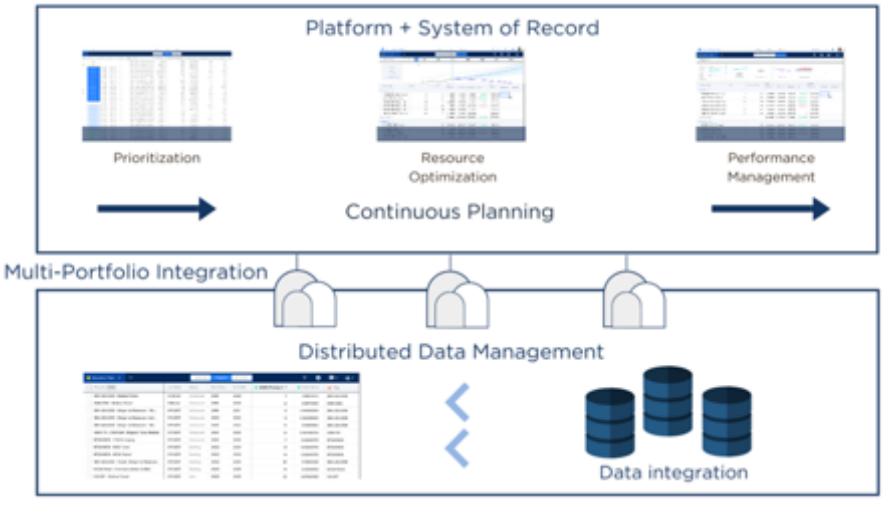
HOW IT WORKS

Decision Lens software is a cloud/web-based solution designed to support continuous planning. It includes a submission module, a collaborative evaluation module using a criteria-driven process, analytics, and visualization modules designed to holistically understand and communicate the benefits, risks and opportunities of S&T investments against decision criteria. This robust prioritization phase combined with a second phase consisting of optimized planning, resource allocation, and performance tracking enable continuous evaluation of investments as they mature through the Technology Readiness Level (TRL) process from basic research to deployed and integrated systems for the war-fighter.

These modules are encased in a portfolio of portfolio construct providing S&T planners with visibility both across the organization and down through S&T layers, with the ability to:

1. Create a portfolio data management structure consisting of criteria, descriptive fields, categories, metrics and budget estimates
2. Share the structure with other portfolio owners – including full assessments of any selected or non-selected S&T proposals.
3. Use the integrated portfolio structure to manage organizational portfolios enabling planners to develop of their own submission modules, criteria, categories and metrics.

By sharing a full analytical structure versus simply sharing proposal documents or files in a database, S&T planners establish more robust and continuous visibility into the perceived value-drivers and of investments at various stages in the technology readiness life cycle. In the sections below, we describe how Decision Lens software is being implemented at multiple levels of Department of Defense (DoD) S&T organizations to create an integrated, and scalable, data management and evaluation framework for the purpose of accelerating innovation.



DECISION LENS ENABLES IMPLEMENTATION OF A TECHNOLOGY SHELF FOR DOD S&T PLANNING

"There's a way to do it better — find it!"

–Thomas Edison

SUBMISSIONS

The Decision Lens submission module enables planners to rapidly configure a form including descriptive fields, categories, metrics and document attachments that can be accessed by submitters. The form can be configured to have required fields and instructions to ensure that proposers are given the context to provide adequate information for evaluation. When a proposer submits their form, the portfolio owner receives an email message notifying them of a new submission along with a link to rapidly access the proposal. The portfolio owner then has the option of returning the proposal with comments requesting updates all in a single platform (today this is often accomplished via emails and spreadsheets), or they can accept the proposal so that it can be prioritized.

PRIORITIZATION

The evaluation module includes a rapid criteria development process and robust prioritization capability, based on a proven mathematical methodology known as Analytic Hierarchy Process (AHP). Distributed evaluators, typically executive-level personnel with a strategic mindset, receive a simple survey asking them to compare criteria in a pairwise fashion for their relative importance in the evaluation.

Decision Lens affords the organization the ability to build multiple types of rating scales for subsequent evaluation of proposals. In the assessment module, distributed evaluators, or subject matter experts (SME), conduct their survey via customizable instructions in a web-based form view. SMEs rate proposals having full access to the proposal submission and all accompanying/attached documents (White Papers, Quad Charts, etc.). The ratings screen is equipped with a comment feature to enable evaluators to add comments justifying their ratings. General proposal commenting is also available to provide peer organizations with useful context with regards to transferred S&T investment proposals.

The ratings are combined with the weighted criteria to produce a prioritized list of proposals based off of executive-level collaborated criteria, and distributed SME subjective opinions on technology linkage to organizational priorities. This methodology combined with the ability to instantly adjust criteria weighting – if the strategic environment undergoes a sudden change enables a rapid and dynamic analysis of the prioritized and value-based investment list.

Planners and portfolio owners have multiple diagnostics available in Decision Lens to quickly identify where there is high variance among evaluators. At the executive-level when building the strategic criteria, there are analytics to understand unusual variance amongst those involved. At the SME-level when evaluating S&T investments directly, there is a heat-map to quickly visualize variance and inconsistencies amongst the SME evaluators and their opinions regarding the S&T investments. The heat map enables an organization to take an introspective look, if necessary, at the strategic criteria to ensure validity and purpose.

RESOURCE OPTIMIZATION AND "WHAT-IF" SENSITIVITY ANALYSIS

Decision Lens provides a variety of graphical tools for portfolio owners to thoroughly review and analyze the evaluations and resulting priorities. The graphics enable "what-if" drills where portfolio owners can test the sensitivity of the priorities of proposals to changes in criteria weights then rapidly generate reports for presentation to executive decision makers. The what-if graphics enable filtering by various sub-groups involved in the evaluation. A resource allocation optimizer enables planners to build potential budget allocation scenarios to ensure high value proposals can be funded based on a variety of differing funding constraints. The budget allocation module provides planners with the ability to look at financials over multiple planning horizons. Planners can populate multi-year budgets or drill down to monthly spend plans all in one interface.

Portfolio grading is built into the system to track the overall value, cost, risk and balance of the portfolio based on recommended funding. Gantt chart views are used to look at investments over multiple planning horizons with comparative scenarios shown as different colored bars. A funding baseline is created from which "what-if" forward planning scenarios can be rapidly created and compared.

Decision Lens is equipped with a recommendation engine, enabling planners to make intelligent and value-driven course corrections to allocation decisions throughout the planning cycle as needed. This give planners the ability to systematically create numerous courses of action (COAs) to present to the decision makers, but also rapidly pivot – within the confines of a meeting – to show iterations that answer questions and concerns of the decision makers. This what if planning engenders a level of trust and defensibility that leaders desire when making any critical decision.

PERFORMANCE MANAGEMENT

Decision Lens Accelerate module enables planners to keep track of proposals at various stages of maturity from draft through completed/transitioned. The multi-year planning module is equipped with machine learning capabilities designed to make forward going recommendations based on historical performance. If certain types of investments are unable to meet milestone targets, the machine learning will provide a recommendation of when the project is likely to hit milestones based on trends to help inform planners of risks and opportunities.

PORTFOLIO INTEGRATION/ TRANSITION

The Decision Lens framework is specifically designed for sharing evaluations with peer organizations. Status quo processes involve dropping proposals into a repository or emailing them from one organization to another, often resulting in the loss of valuable assessments of the proposal. Decision Lens enables portfolio sharing and integration capabilities where portfolio owners can share their entire evaluation structures, portfolio level summary comments on the status of the S&T investment and all historical data for any proposals or plans they choose. This shared framework can then be used by peer or parent organizations to build up and automate their own evaluation processes.

SUMMARY

A major gap developed over recent decades whereby S&T investments are often lost in disjointed and antiquated processes for S&T investment processes – including proposal submissions, evaluation, financial management and performance management. Decision Lens facilitates the realization and implementation of a Technology Shelf to help close this gap, thereby providing massive benefits for accelerating critical military investments across DoD, and for our war-fighters, at the speed of relevance. Maintaining U.S. military strategic advantage is critical in "providing a combat-credible military force needed to deter war and protect the security of our nation," and until the DoD focuses its investments in a centralized, cooperative, collaborative and cost-sharing environment then the gap will continue to grow and our strategic advantages will likely dissipate.

FOR A DEMONSTRATION OF THESE CAPABILITIES, PLEASE CONTACT US AT INFO@DECISIONLENS.COM AND REFERENCE DECISION LENS FOR DEFENSE RELATED S&T PLANNING.