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Challenging Industry to Innovate! How the
Government Can Apply Transparency,
Collaboration, Unencumbered
Communication, and Dynamic Engagement
Through Challenge-Based Acquisition

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ACQUISITION RESEARCH PROGRAM
DEPARTMENT OF DEFENSE MANAGEMENT
NAVAL POSTGRADUATE SCHOOL

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Challenging Industry to Innovate! How the Government Can Apply Transparency, Collaboration, Unencumbered Communication, and Dynamic Engagement Through Challenge-Based Acquisition

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Abstract

The Defense Information Systems Agency (DISA) Telecommunications Advanced Research and Dynamic Spectrum Sharing Systems (TARDyS3) program demanded new ideas and novel approaches for sharing electromagnetic spectrum between the Department of Defense and commercial industry. To solve this problem, DISA created an acquisition structure that focused on



building transparency, collaborating, and actively communicating with industry across the entire acquisition. This focus on dynamically engaging vendors and encouraging innovation allowed DISA to rapidly deploy high-quality and user-approved capabilities. Dynamic engagement involves a two-way exchange of ideas, listening to industry by seeking input, and conveying the government's ideas and motivations to potential vendors, while innovation centrality consists of encouraging vendors to solve problems with unique solutions, providing a framework for future acquisitions. Dynamic engagement, coupled with innovation centrality, powerfully engages the vendor community to solve hard problems. Combining innovation with communication creates a vendor community that is motivated to meet the government's needs, and it accelerates risk mitigation. Furthermore, it can improve product quality and shortens delivery time lines at a reasonable price. For these reasons, future programs should consider incorporating dynamic engagement and innovation-centric approaches at the core of their acquisition strategies.

Introduction

Government acquisition can be slow, arduous, and illogical at times. While information expands and technology evolves exponentially, U.S. acquisition processes generally cannot keep pace with advances in technology. This is the classic problem. When government agencies follow the standard acquisition processes, often by the time they field a solution, the capability has already become outmoded. The enemy has adapted to the capability involved, the threat has changed, and/or the technology has advanced past this late-to-the-field capability. As Vice Admiral Jeffrey Trussler has stated,

I don't think we keep up with the industry opportunities. We write requirements and we send them out, let industry compete. But boy, that's an unsatisfying process sometimes when we have trouble taking advantage of and seeing opportunity because we didn't identify it as a requirement. (Tadjedeh, 2021)

Challenge-Based Acquisition (ChBA), as guided by the ChBA handbook, offers a better way to meet government and end user needs (Roe et al., 2020).

From an innovation perspective, government acquisition processes generally lack dynamic engagement; that is, other than the occasional question-and-answer session, they often involve little meaningful exchange of ideas between the government and industry. Moreover, acquisitions can fail to motivate vendors to bring their best innovations to bear on the government's problems. Steve Blank (2019) stated, "These processes reduce risk to an overall organization, but each layer of process reduces the ability to be agile and lean and—most importantly—responsive to new opportunities and threats." He is right on this point.

In many acquisitions, vendors read the government-authored solicitation that often stipulates all aspects of the solution to be built through a tightly confined performance work statement (PWS) or statement of work (SOW). The government selects the best builder on paper, not the vendor with the best, most innovative, highest impact solution; often, vendors simply regurgitate the government-authored SOW in their proposals to increase their likelihood of award. This standard acquisition process often represents an exercise that reflects who can best follow directions, offer a predictable method of building the pre-articulated solution, and show success in past projects. This is not how we acquire goods and services in our private lives; it should not be how the government acquires solutions for complex defense problems, either. Consider how most people purchase a vehicle. They want to understand the options available and get the opinions of others who own similar cars—that is, conduct market research. They would take a test drive—that is, try out the vehicle in an operational environment—and evaluate how well it meets their needs.

The same applies to defense acquisitions. The Department of Defense (DoD) needs an acquisition model that focuses on dynamic engagement and innovation, allowing the



government not only to balance risk but also see the full span of solution sets. The DoD needs to be able to test drive solutions. The Telecommunication Advanced Research and Dynamic Spectrum Sharing Systems (TARDyS3) program, leveraging ChBA and dynamic engagement, offers an example of how to do this.

This paper describes the TARDyS3 project, its innovations, and its unique acquisition approach in a way that enables other programs to emulate TARDyS3. After describing the basics of the TARDyS3 project, the authors discuss acquisition strategy enablers that set the baseline for success. The paper then provides nine detailed methodologies that supported TARDyS3 dynamic engagement and innovation outcomes. In addition to providing a model for the future, this paper also provides discrete actions that can be taken by any program to enhance its dynamic engagement and innovation-centric approach.

Sharing Spectrum: DISA's Unique Need

In TARDyS3, the Defense Information Systems Agency (DISA) needed to devise a way for the DoD to actively share electromagnetic spectrum with commercial fixed and mobile broadband network operators in the 3550–3650 megahertz (MHz) band without modifying the DoD systems already operating in that band. Moreover, the DoD solution needed to integrate with the efforts of the commercially driven Citizen Broadband Radio Service (CBRS), which incorporated other external systems for managing commercial spectrum operations. Specifically, TARDyS3 needed to provide the tools that permit complex sharing arrangements, thereby enabling DoD to schedule operations and conduct interference analysis and resolution activities. This work was unprecedented within DoD. Given the complex spectrum sharing ecosystem, DISA needed a radically new set of tools to deconflict, manage, and predict spectrum interference. Thus, before acquiring a solution, DISA needed to better understand both the problem space and potential solution sets. Industry-driven innovation was critical to overall acquisition success. Dynamic communication made it happen.

TARDyS3: An Innovation Theory

DISA's unique spectrum sharing needs consciously drove an engagement-focused and innovation-centric acquisition approach. Before initiating any acquisition activity, DISA hypothesized and envisioned an acquisition that dynamically engaged industry partners and encouraged innovation by being transparent with and by actively collaborating with industry. To test this hypothesis, DISA drove these themes of *dynamic engagement*, which involves both listening to industry by seeking input and communicating with industry to express DISA's views, and *innovation centrality*, which involves encouraging vendors to solve problems by applying unique solutions into every facet of the acquisition.

The TARDyS3 acquisition team started by defining what the team wanted to avoid. Often, the acquisition process leaves industry guessing when solicitations will be released, the type of contract vehicle the government will use, the final requirements, and how the government will evaluate bids. Industry scrambles to solve the problem when the government releases the solicitation. TARDyS3 sought to break this cycle with industry and be as open as possible regarding the requirements, the program goals and intentions, the chosen acquisition process, and the chosen solution. The goals included (1) ensuring that industry would be well informed so it could deliver the best possible solution and (2) giving industry the maximum freedom to innovate.

From Theory to Reality

With TARDyS3, DISA took informed risks to try a new approach and test its hypothesis regarding dynamic engagement and innovation centrality. The TARDyS3 team resolved to



remain entirely open throughout the acquisition and clearly communicate changes, challenges, and expectations. The team wanted vendors to clearly understand the government’s priorities and to help vendors understand how they could compete to win. This led the team to make three initial proposals. First, DISA would conduct an extensive pre-solicitation market engagement campaign that sought industry’s technical ideas, informed industry of DISA’s plans, and sought industry feedback on DISA’s proposed approaches. Second, DISA would solicit for a prototype other transaction (OT) to seek innovative solutions and “fail fast” if the outcomes were disappointing. Third, DISA would use a ChBA to focus the vendor selection process on risk-balanced innovation. In other words, DISA’s strategy focused on using transparency and innovation to build trust and understanding. These three proposals became the enablers of success.

The TARDyS3 team implemented a multi-phased ChBA strategy that encouraged innovative solutions through openness and incentivized reasonable pricing through competition. The multi-phased approach emphasized continuous competition that kept offerors focused on improving and maturing their proposed solutions right up until the final award.

Phase 0: Comprehensive Market Engagement

Market research informed the government’s decision to use a multi-phased ChBA OT and helped refine the TARDyS3 requirements. Phase 0 began with an abbreviated request for information (RFI) that published the government’s proposed TARDyS3 plans and requirements; it requested answers to specific programmatic questions in a white paper format (see Figure 1). The RFI responses established a broad TARDyS3 vendor community, highlighted key risks, challenged the government’s assumptions, and highlighted technical uncertainties. Continuously focused on dynamic engagement, the government invited selected vendors whose RFI responses included innovative or interesting ideas to discuss those concepts in virtual one-on-one meetings.

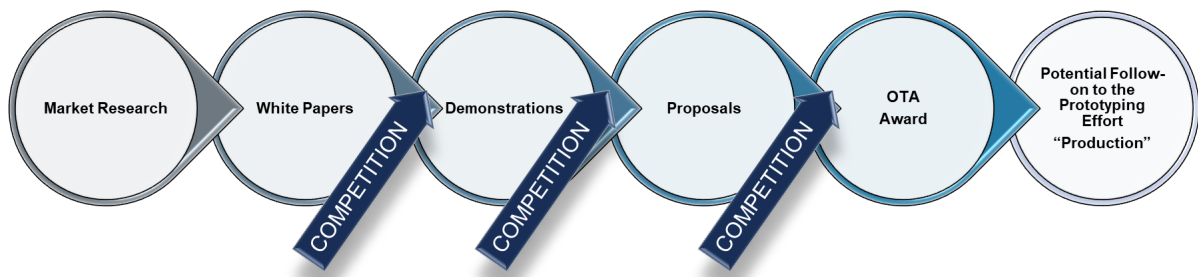


Figure 1. TARDyS3 Competition Process

Also, in the spirit of openness, the government team invited vendors to an “Ask Me Anything” event at which the government program manager fielded vendor questions about the technical and acquisition specifics. At this stage, the government recognized the broad set of skills needed to successfully complete TARDyS3 and used the “Ask Me Anything” session to encourage vendors to begin exchanging contact information. Throughout the market engagement process, the government updated the RFI with additional information, changes, and ideas to assist the vendor community. Twenty-six vendors participated in market engagement.

Phase I: Request for White Papers

The request for white papers (RWP) formally initiated the TARDyS3 solicitation. The RWP included a Statement of Need as the base requirements document to articulate the government’s vision of the TARDyS3 end state. (The PWS would be collaboratively built later.)



The RWP deliberately failed to specify an anticipated solution set. Additionally, the RWP included a thorough description of the complete acquisition process, expectations, evaluation criteria, and draft Phase II demonstration scenarios. Thirteen vendors submitted white papers, and as a result of a rapid evaluation, the government invited the most highly rated six vendors to participate in the subsequent phase: challenge demonstrations.

Phase II: Challenge Demonstrations

The selected vendors provided capability demonstrations for six ChBA scenarios. This phase focused on mitigating risk, understanding vendor-driven innovations, and ensuring vendors could deliver workable solutions. The demonstrations asked vendors to address risks that the government identified in white paper responses, articulate a product roadmap, demonstrate software development capabilities, showcase spectrum expertise through a tabletop exercise, demonstrate affordability, and convey other transaction authority (OTA) compliance. Prior to the demonstration days, the government hosted a planning session with industry that allowed the government to describe the ChBA process in detail, enabled vendors to check their technical systems, and invited vendors to ask questions of the government representatives. Following demonstrations, the government invited two vendors to participate in the subsequent project proposal phase.

Phase III: Request for Project Proposals

The final phase invited two vendors to submit project proposals and draft PWSs for evaluation and review. This phase focused on value—ensuring the government could procure the right technical solution at the right price. The government invited vendors to one-on-one collaborative meetings, where they could refine their PWSs and proposal elements. This enabled the two vendors to better understand government concerns and expectations. Evaluations resulted in selection of a single vendor and award of a prototype OT following final negotiations. The government awarded the OT agreement with the expectation that a multiyear production effort could be negotiated with and awarded to the successful vendor upon successful prototype completion.

Enabling Success

Dynamic engagement and industry-driven innovation permeated each acquisition phase, as the government remained open about changes, expectations, and perceived risks. Moreover, dynamic engagement kept the government receptive to industry ideas and technical innovations. The team leveraged three enablers that formed the framework of success and garnered the best possible outcome for TARDyS3: innovative market research, a multi-phased ChBA approach, and OTA agreements.

Innovative Market Engagement Enabler

Market research is essential to acquisition, but it typically involves a “check the box” paper drill with few actionable results. The TARDyS3 dynamic engagement hypothesis drove a completely different market research approach: one focused on transparency, collaboration, and open communication with industry. This involved using RFIs, one-on-one engagements, and multi-vendor meetings to identify acquisition and technical risks, understand the realm of the possible, and seek vendor input on DISA’s plans. Moreover, dynamic engagement required DISA to share incomplete plans and discuss ideas even while they were not fully formed. This opened the lines of communication and helped DISA build a rapport with industry that would permeate the process all the way through to award. Information gathered during dynamic engagement helped DISA formulate its acquisition documentation and helped potential vendors better plan their responses to the government’s requirement.



Guidance for the Future

- Create a vendor community through market research by actively communicating and developing a common purpose among the large number of interested companies
- Move beyond paper-based market research and talk to vendors; ask questions and let vendors ask the government representatives questions as well
- Focus on program risks, dependencies, and opportunities; let vendor expertise and inputs help the government shape its acquisition
- Share the government's acquisition plans and requirements, even if they are incomplete, and let vendors identify unforeseen risks and incorporate government plans into their response strategies

Multi-Phased ChBA Enabler

The multi-phase down-select process continued to build trust with industry after market research by remaining clear about expectations and making it as easy as possible for vendors to participate. Describing exactly what the government was expecting freed vendors to focus on their technical innovations. The multi-phased approach had the unique advantage of enabling each phase to inform the subsequent phase. Thus, risks identified in one phase could be addressed in the next phase; each down-select gave vendors an opportunity to improve their technical solutions. Instead of leaving vendors to guess what the government really wanted, DISA used this multi-phased approach to communicate clear expectations, objectives, and requirements to vendors. Moreover, the multi-phased down-select maintained a focus on competition, incentivizing vendors to propose their best technical solutions at the most reasonable price.

Guidance for the Future

- Emphasize competition among vendors throughout the acquisition process and provide a constant incentive for vendors to deliver their best technical approaches at reasonable prices
- Communicate expectations of what constitutes a good proposal and how vendors can use their technical insights and innovations to gain a competitive advantage

Other Transaction Agreement Enabler

The TARDyS3 project outcomes were unprecedented within the DoD, and innovative solutions that leveraged new ideas, concepts, tools, and processes were needed. Consequently, the ChBA multi-phased approach resulted in awarding a prototype OT agreement for the TARDyS3. The OT construct required participation from nontraditional defense contractors, which naturally brought innovative thinking into every proposed solution. OTs also had the benefit of adding flexibility and speed to the acquisition process, freeing the DISA team to focus on risk. While maintaining fairness amongst the vendor pool was one of DISA's paramount concerns, the OT framework relieved the government team of the burdens inherent in a standard procurement and enabled rapid vendor down-selects. Finally, the short horizon (in the case of TARDyS3, 1 year) of a prototype OT enabled the government to quickly evaluate success after vendor performance began. As an off-ramp, if needed, DISA could quickly identify a prototype failure and conduct a separate capability acquisition with minimal loss of schedule and resources.

Guidance for the Future

- Use prototype OTs, when appropriate, to inspire vendor innovation, focus government evaluations on risk, and accelerate the acquisition process



The results of the TARDyS3 prototype have direct relevance to enhancing the mission effectiveness of warfighter systems. Without TARDyS3, interference between CBRS and DoD warfighters cannot be predicted, prevented, or mitigated, and mission-critical DoD systems will fail to function, resulting in both training and operational mission degradation. A successful TARDyS3 tool suite prevents mission failures due to spectrum use conflicts and minimizes the impact of spectrum sharing on DoD systems within the affected spectrum band. DISA implemented the acquisition approaches described in the following sections to make it a reality.

Applying Dynamic Engagement and Innovation Centricity

Ultimately, TARDyS3 focused on continuous competition and continuous government/industry engagement. By the time of award, the selected vendor had developed a deep understanding of the TARDyS3 problem space, had matured an innovative solution to the TARDyS3 problem, and had demonstrated a proven capability to deliver products that met the TARDyS3 requirement. Additionally, the government had the confidence that the vendor understood and addressed TARDyS3 risks. DISA applied the following discrete methodologies to TARDyS3, which have broad applicability to future acquisitions.

Building the Right Acquisition Team

Often, acquisitions do not have the luxury of picking the personalities, leadership, and skill sets that make up the team. TARDyS3 did not have this luxury either; however, the team consciously fostered a group of government and Federally Funded Research and Development Center (FFRDC) subject matter experts that functioned as a true partnership. The team consisted of experts with a broad array of skill sets that included innovation, contracting, acquisition, program management, spectrum engineering, software development, cybersecurity, and systems engineering; collectively, this team possessed in-depth knowledge of the government's needs relative to TARDyS3. Moreover, this broadly skilled team could assess a wide scope of industry innovations, which increased the team's willingness to seek and evaluate new technical and process ideas. Team members exchanged constant internal communications through emails, phone calls, and recurring stand-ups. Effective leadership and internal communication ensured members shared a common view of the acquisition's status, understanding of its ultimate goals, knowledge of next steps, and a clear understanding of responsibilities. Furthermore, the team used risk-driven agendas to drive core considerations at each meeting and leveraged peer reviews from external personnel to improve decisions and final documentation as it pushed forward. An evolving risk map drove the team's prioritized workflow. Stated generally, the team had the right people, leadership, and culture. The members thrived on working together, figuring out problems together, and working with one another. This brought success.

Guidance for the Future

- Build a broad technical and functional team that can understand and assess the risks and opportunities driven by industry innovations
- Lead regular synchronization meetings with the acquisition that use risk-based agendas; avoid internal confusion that will often translate into stakeholder and industry confusion

Reducing Risk Across the Program

Throughout the entire acquisition process, to include the market research, the TARDyS3 acquisition team focused on identifying, characterizing, and mitigating programmatic risk. Specifically, in the early market research phases, the team issued an RFI seeking primarily to identify vendors with software development expertise in specific areas relevant to the TARDyS3 requirement. Once it had identified those vendors, the team performed individual one-on-one



engagements to discover the key risks that would likely impact the TARDyS3 prototype development. Over the course of the market research phase, the team communicated openly with industry to ensure the TARDyS3 requirement was well understood before DISA issued a formal solicitation.

Following the market research phase, the ChBA process for TARDyS3 offered a dynamic method for the government to evaluate each proposed solution more thoroughly by presenting potential vendors with carefully constructed challenges, asking questions, and engaging in a real-time dialogue to gain a more complete understanding of the proposal and the offeror's ability to meet the technical requirements. It also gave the government an opportunity to see the vendors in action and how each of the vendor teams functioned in both demonstrating against the scenario and answering questions in real time. This identified some vendor teams as very knowledgeable with a deep understanding of the problem space, while showing that others lacked demonstrable understanding beyond what they could capture in a white paper response. This risk-focused approach elevated more-capable vendors.

Additionally, the entire acquisition process provided greater transparency and opportunities for meaningful collaboration between the government and vendors. In particular, during challenges the government was equipped to ask pertinent questions about vendors' solutions, observe how vendors would perform during different scenarios, and provide feedback on the proposed aspects of the solution. Ultimately, the vendors determined to propose the best solutions at the conclusion of challenge events could draw on the government feedback to enhance the final prototype solution, thereby further reducing programmatic risk.

Guidance for the Future

- Collaborate with industry to identify, characterize, and mitigate risk throughout the acquisition
- Structure the acquisition strategy to assess and mitigate identified programmatic risks
- Leverage open discussions in market research to broadly identify and characterize risk

Continuous Acquisition Improvement

Many acquisitions force the procuring agency to specify the complete solution when releasing the initial solicitation. While TARDyS3 defined the high-level outcomes and expectations in its initial RWP, the multi-phase ChBA processes, coupled with dynamic engagement, provided meaningful latitude to improve the acquisition process as it proceeded. DISA learned from one phase to the next, clarified requirements and expectations, and dynamically assessed risks.

The Statement of Need was a living document that DISA continually updated throughout the acquisition process. In particular, DISA learned a great deal about the "art of the possible" after reviewing the innovation-driven white paper submissions. Informed by risk assessments of innovative solutions, active communication with vendors, and consultations with subject matter experts, the TARDyS3 team updated the Statement of Need with important information at the conclusion of challenge demonstrations, vendor collaborations, and the final down-select. These updates significantly increased the likelihood of producing a successful prototype, and they took TARDyS3 to the next level with respect to meeting warfighter needs in this space.

DISA used the Statement of Need to develop evaluation criteria for each phase of the OTA process. Understanding that vendors had considerable leeway to propose unique solutions that would widely vary from vendor to vendor, the Statement of Need and evaluation criteria used in each phase of evaluations allowed the government team to evaluate proposed solutions fairly and equitably. Like the Statement of Need, the evaluation criteria were informed by



previous acquisition stages and by the dynamic engagements in those stages. DISA evaluated risks that became apparent in white papers in subsequent phases to drive down its risk exposure. Additionally, the government highlighted the specific areas of evaluation in its communications to the vendors to incentivize risk mitigation throughout the acquisition. By the time the government received final proposals, most of the meaningful technical and business risks had already been addressed and mitigated.

DISA communicated the challenge scenarios early, as drafts in the RWP phase, for offerors to review and get a sense of the acquisition process flow, downstream requirements, and what the government would ask of them. DISA marked these scenarios as drafts, with the intention of modifying them over the course of the acquisition. DISA clearly communicated this to the vendors up front and then used the risks identified in white papers to craft modified challenges. While some scenarios evolved from draft to final, DISA added other scenarios that addressed newly identified risks. To solidify the challenge approach, the team led a transparent back-and-forth question-and-answer (Q&A) session with the vendors in order to answer questions, receive feedback, and modify and/or inject additional information into the scenarios. This enabled the vendors to provide input to the challenge process and enhance their buy-in.

While the government improved its Statement of Need, evaluation criteria, and scenarios as the acquisition proceeded, DISA also gave vendors the opportunity to enhance and refine their solutions through each phase. The flexibility of both the ChBA process and the OTA procurement approach made this possible. The open collaboration between the government and industry, including the clear articulation of risks and opportunities that the government identified in proposed solutions, injected key feedback that enabled vendors to improve their submissions. This directly mitigated risk at each acquisition phase and helped enhance product quality.

In the final stage of the acquisition process, the government held collaboration days with the vendors selected to move forward from the challenge demonstration. The primary goals for these collaboration day events were to refine the work statement that would be used to guide the prototype OT and to ensure that the contractual requirements would enhance, rather than constrain, the vendors' technical approach. During these events, the vendors and the government discussed how each vendor would envision execution of the OTA, and the government worked with the vendors to identify methods of meeting the government's statutory requirements for oversight without constraining the vendors' approach. The vendors and the government continued to discuss and work through programmatic risks during this final stage of the acquisition process. To maintain fairness, DISA gave both vendors an equal opportunity at these collaboration day events to guide the conversation and ask the government as many questions as time would allow. DISA tailored these collaboration days to each vendor, and these events proved critical to ensuring that the contractual requirements written into the prototype OTA enabled program success.

Guidance for the Future

- Use statements of need to encourage outcome-driven innovation
- In multi-phased acquisitions, use the knowledge gained during one phase to inform the subsequent phases; give vendors an opportunity to improve their solutions while the government improves acquisition documents and expectations
- Recognize that transparent and timely communication (e.g., draft documents, expectations of the government are critical to building trust and accelerating the acquisition)
- Communicate risks and opportunities to vendors as often as practicable; give vendors the opportunity to address risks without detracting from the positive elements of their solutions
- Conduct two-way verbal communication and collaboration sessions with industry to reduce risk and improve the acquisition



Requirements Clarification

Clear requirements played a critical role in the overall success of the TARDyS3 multi-phased down-select process and in the prototype development effort to date. DISA communicated clearly and openly with the vendors throughout the entire process so that they could create the best solution possible that met or exceeded the government's needs. The TARDyS3 acquisition demonstrated the importance of effectively communicating the government's selection process and expectations as well as the overall goals of the acquisition. In communicating with vendors, the TARDyS3 team focused on the problem the vendors were trying to solve and the high-level objectives they were seeking to meet with any of the solutions offered.

To provide requirements clarity, the government must have a coherent approach to the acquisition. The TARDyS3 team had to have a full understanding of its goals and the processes ahead. Unless the government fully understood its goals and its method for achieving them, it could not clearly identify the innovative acquisition process flow and the requirements for TARDyS3. This process began with the government writing the OTA authorization form for TARDyS3. While this is a typical part of the process when a government agency considers using an OTA, it represents an outstanding forcing function to assemble the necessary expertise, staff, resources, and so forth, and to clearly articulate the government's objectives.

When beginning communications with industry, DISA answered industry's questions promptly and held logistics days to clearly stipulate expectations as well as one-on-one collaborative sharing sessions. Unlike the typical arms-length relationship, the government and the vendors exchanged free-form questions, sharing their goals, objectives, preferences, and views. The government clearly described the acquisition process and all three phases to the competing vendors from the start so that the vendors knew the detailed process from Phase I through Phase III and the expectations throughout. This type of collaboration and transparency, again, was critical to a successful TARDyS3. DISA set this tone from the very beginning.

Guidance for the Future

- Communicate simply, clearly, and often across the government team and with industry to set expectations and align the effort to the government's objectives
- Engage with industry to allow loosely structured back-and-forth Q&A that builds trust and collective knowledge, since more information and trust improve proposed and delivered solutions

Maintaining Clear Expectations/Early and Consistent End User Engagement

The logistics approach taken for the TARDyS3 OTA effort, from pre-award through post-award was unique in a variety of ways. Generally speaking, industry has longed for much more clarity from the government in the solicitation process, particularly in the area of RFIs and other market sourcing initiatives. In contrast, a highlight of this acquisition was the lucidity in the communications and logistics process. The subsequent paragraphs will note how this approach and methodology maximized the efficiency of the government's use of time and resources with respect to employment, technique, and benefits.

In recent years, stakeholders and shareholders have expressed an ever-increasing frustration with lack of communication about planning, knowledge, areas of responsibility, and expectations during the federal acquisition cycle. The TARDyS3 OTA project employed a methodology that leveraged real-time interaction between the government technical evaluation team and the vendors, rather than the limited communications normally associated with traditional practices. This manifested itself in the multiple forums that the government held with industry throughout the acquisition process. These logistics days allowed the government team



to set expectations with industry, communicate changes (such as schedule modifications), and answer questions from industry about the acquisition process.

During the market intelligence gathering process of the OTA procurement, DISA handled meetings with potential vendors in a very open-ended fashion, frequently using events to engage private industry such as “Ask Me Anything” and one-on-one sessions and other activities to promote communications, transparency, and clarity.

The opportunities that vendors gained in pursuing partnerships present perhaps the clearest example of end user engagement during the TARDyS3 OTA procurement process. Even as the team approached Phase II challenges, which were considered the later part of the competition, vendors still had a chance to partner with new nontraditional defense contractors and produce a capability that could potentially serve the best interests of the government. This approach resulted in healthy interaction between parties and increased competition, resulting in a more quality end product.

The ChBA process provided for an efficient use of time and prioritization for both aspiring vendors and the government. From the vendor’s perspective, the open communication between the vendors and the government team allowed industry to convey just enough information about the intended proposed solution, while not compromising the proprietary rights needed to maintain business continuity and competition. At the same time, this approach afforded the government the unique flexibility to configure draft problem sets that it could release to vendors in an open fashion at relatively low operational and informational risk. As a result, the technical evaluation team could tier its assessments appropriately, while vendors could offer their best solutions.

Guidance for the Future

- Notify industry early about the acquisition direction and objectives
- Inspire innovation by configuring the requirement in terms of solving a problem or achieving an outcome. This incentivizes technological advancement and enables agile and adaptable contracting procedures
- Focus on establishing a common understanding with industry on knowledge and best practices. Avoid a high-minded perch that the government holds exclusive expertise. Always look to open pathways for fruitful and worthwhile engagement in both directions

Stimulating Innovation Through Vendor Partnerships

From the beginning, the TARDyS3 team wanted to ensure that the most innovative ideas and approaches were applied to the TARDyS3 requirements. Furthermore, the team wanted to make sure that companies enhanced their solutions with well-rounded partnerships. Specifically, during market research it became clear that many spectrum vendors lacked experience in DevSecOps software development, whereas the software vendors knew little about spectrum management.

The TARDyS3 team created a secure “Match Making” website to help niche and nontraditional vendors present their capabilities to the entire TARDyS3 vendor community. The site allowed companies to register, submit information about their organization, and then review potential partners. Industry was encouraged to use the site to learn about companies that could be potential partners for success in response to the white paper phase of the ChBA multi-phased process. In essence, it allowed those niche and nontraditional companies to publicize their capabilities to other vendors and to identify the teaming arrangements or partnerships to improve their bids. The TARDyS3 team wanted to ingrain in all participating vendors that the government would help to foster collaboration within industry and to provide a bridge in



communications. This was one of the first steps taken in making sure the OTA awardee represented a well-rounded team with multiple skill sets.

Guidance for the Future

- Encourage vendors to speak to one another early in the market research process; provide a forum that consciously encourages partnerships among the vendor community

Acquiring Vendors With Multiple Skill Sets

The TARDyS3 acquisition approach focused on and incentivized performance in two areas of expertise. First, vendors would have to apply complex spectrum management skills and a detailed understanding of the operating environment and regulatory framework. Second, vendors would have to apply modern software development approaches that enabled test-driven development, user-centric design, and DevSecOps product delivery.

The team plainly stated these desired outcomes to the vendor community. During market research, the government specifically told vendors that DISA needed both spectrum and software expertise and would evaluate bidders on that basis. To further support these objectives, the government established the website described in the previous section, which focused on enabling vendors to learn each other’s capabilities and team with one another.

After DISA received white papers in Phase I of the acquisition, it took two specific steps to ensure that the selected vendor could successfully deliver the requisite skills in spectrum and software. First, the team applied evaluation criteria that focused on the vendors’ ability to demonstrate why they would succeed in the next phase: challenge demonstrations. This allowed the team to eliminate vendors that did not show a viable path to applying both spectrum and software knowledge. Second, the government provided specific feedback to vendors that advanced to challenge demonstrations. The team specifically told them about the opportunities and risks that the government had identified and asked them to mitigate those risks in the challenge demonstration phase. This approach allowed vendors with a viable path to applying spectrum and software expertise to refine their approaches and overcome any shortfalls in their applied expertise (through additional partners, changes in their team, etc.).

DISA constructed ChBA scenarios for which demonstrations centered on separate spectrum management and software development challenges. This approach incentivized vendors to build well-rounded teams and innovate in their technical solutions, knowing that successful award would depend on an ability to successfully demonstrate expertise in both areas. In the challenge demonstration phase, vendors exercised those skill sets through their demonstrations and answered questions from the government team that tested their in-depth knowledge of spectrum management and software development. Successful vendor demonstration teams were able to respond to the demands of both scenarios.

Vendors that formed well-rounded teams successfully demonstrated their capabilities. The successful vendors entered into partnership agreements and teaming arrangements that emphasized the strengths of each partner. In effect, this approach allowed the TARDyS3 ChBA to identify and mitigate risks that would result from an inability to apply both spectrum and software expertise. This early focus on risk poised TARDyS3 for development of a successful prototype.

Guidance for the Future

- Identify the key skill sets and expertise necessary to succeed; incentivize performance and mitigate risk early by evaluating identified skill sets separately
- Communicate early and often with industry what the key skill sets might be; ensure vendors know that they must address them during the evaluation phases of the acquisition



Controlling Costs

TARDyS3 applied a robust price analysis structure that evaluated just enough price information at each stage to inform risk without delaying the selection process. It did so by communicating the intent of price evaluations at each phase, and delving into core details of vendor price proposals, instead of assessing affordability as a pass/fail. In the end, this ensured that the government understood vendor solutions, the vendor understood the government's core considerations, and that the chosen solution was affordable across the entire acquisition life cycle.

In the market research phase, DISA asked the vendors to provide rough order of magnitude estimates, highlighting cost drivers and uncertainties for the government. This price focus enabled the TARDyS3 team to better understand risks, dependencies, and unknown elements from a vendor perspective. The team used this information to clarify and refine requirements for the RWP. Following this phase, the solicitation initially asked for a price estimate, with the expectation that the vendors would provide additional justification later in the acquisition process. This approach helped ensure that prices proposed in Phase I were reasonable, without incurring a high proposal development or evaluation burden. The high-level evaluations at this stage cast light on the most viable competitors by highlighting gaps in vendor solutions, solutions with insufficient levels of effort, unaffordable solutions, vendor uncertainties, and additional risks to be mitigated in Phases II and III. DISA clearly communicated its findings to the vendors.

Following Phase I, during the invitation to the Phase II challenge demonstrations, the government revealed its cost estimate to the vendor community. Once proposed solutions were understood during the white paper phase (Phase I), the TARDyS3 team provided vendors with feedback, including a list of risks and a list of positively evaluated features and attributes. This communication helped vendors refine their technical solutions while still staying within the government's price targets. The challenge demonstrations required vendors to provide oral presentations on how their proposed solution enhanced project affordability, increasing clarity about the vendor decision-making process.

DISA asked each of the two vendors that were promoted to Phase III, project proposals, to provide detailed cost estimates of its work, including the buildup of fully burdened labor rates. An in-depth understanding of proposed labor rates and milestone prices highlighted vendor uncertainties and price reasonableness. The vendor with higher labor rates had to justify those rates; similarly, the vendor with higher labor hours had to justify the risks and the tasks that drove those hours.

OTAs are widely known for their flexibility and speed. Robust price analysis may seem inconsistent with these characteristics; however, price analysis can provide the government with exceptional insight into technical solutions without creating additional hurdles in execution. With an OTA, a program can progress rapidly while being thorough. In a ChBA, the government rarely compares the same technical solutions. Thus, a focused price analysis becomes critical to creating an equitable understanding of disparate solutions. The price analysis creates a framework for understanding proposed solutions in terms of risk and gives the government the tools to ensure technical suitability.

Guidance for the Future

- Inform vendors that the government intends to use high-level price analyses to highlight technical risks, dependencies, and uncertainties
- Use multi-staged acquisitions to focus on lowering costs through iteration
- Consider releasing the government cost estimate to better scope vendor solutions



Cultivating Innovation

The nature of ChBA supports vendors in applying innovative problem solving, developing innovative solutions, and identifying the full solution space for meeting the government's needs. Demonstrations of the vendors' proposed solutions took place in an operational-like environment and allowed the vendors to build solutions tailored to the government's problem. Again, the government did not prescribe a solution but instead stated its problem more broadly and asked for help in solving the problem. This fostered innovation.

Per the ChBA handbook, "ChBA is based on the concept that Government agencies can best perform acquisitions if they present the solution to be acquired as a need (the challenge) and potential providers are free to propose innovative solutions that fill the need" (Roe et al., 2020). Following the guidelines provided in this document, a well-crafted challenge, accompanied by clear, transparent, and effective assessment methodologies and appropriate contracting vehicles, leads to successful acquisitions.

Furthermore, the ChBA handbook describes requirements flexibility:

In traditional acquisition, the government communicates its needs in a specification (such as a statement of work). ... The fundamental flaw in this process is the failure to recognize that the government-dictated specification drives design constraints and possibly limits the government's ability to obtain the best solution to address its need. To avoid these problems and implement ChBA successfully, the government must allow industry to innovate within a well-defined performance-based framework. (Roe et al., 2020)

TARDyS3 used all of the above principles to guide ChBA and OTA, particularly in the demonstration instructions and evaluations that asked for innovative solutions. Innovation was a priority. While the products and processes differed between vendors, as DISA expected, they were graded according to the same criteria that focused on innovation. In other words, through its non-limiting statement of need and innovation-focused evaluation criteria, the TARDyS3 acquisition sought and incentivized innovation and unique concepts to solve the problem.

Guidance for the Future

- Use dynamic engagement via a set of open objectives (rather than a prescribed solution) and transparency in executing vendor demonstrations in operational-like environments; this strongly encourages innovation in the solution space

Outcome of the TARDyS3 Investigation

The TARDyS3 acquisition's focus on dynamic engagement and innovation represented a conscious departure from the typical acquisition processes used to solve spectrum sharing problems. It became very clear early in the process that communication and innovation benefited the government through enhanced vendor engagement and better technical solutions. At the time of award, both the chosen vendor and government had a deep understanding of the requirements and the proposed solution. Moreover, the government and vendor had built trust and a working relationship before award through open communication, and they could effectively transition from pre-award discussions into productive collaboration on prototype development. The TARDyS3 focus on innovation ensured that the delivered solution represented the best possible technology that the government and industry team could collaboratively develop.

As an example of how effectively the TARDyS3 process functioned, the vendor deployed its minimum viable products 4 months after beginning the OT. Moreover, combining the



thematic elements of collaboration, communication, and transparency accelerated the entire acquisition process and enhanced the quality and effectiveness of the prototype. TARDyS3 reflected spectrum scheduling capabilities that gained the praise of users less than 11 months after DISA released its initial solicitation.

The result of the successfully completed prototype will be a minimum viable capability release (MVCR) enabling spectrum scheduling, interference assessment, and interference resolution in the 3550–3650 MHz band. At the time this paper was published, the prototype developed under this effort was being tested, evaluated, and refined in preparation for a potential future production effort; all indications continue to show that the government’s focus on dynamic engagement in the acquisition enabled the fielding of a highly successful TARDyS3 prototype.

A Framework for Future Implementation

As demonstrated by the TARDyS3 example, dynamic engagement and innovation centricity can generate powerful acquisition outcomes. While no two acquisitions are identical, the underlying themes, enablers, and core activities apply broadly to a wide range of future acquisitions.

From an acquisition strategy standpoint, success in TARDyS3 depended upon applying innovative market engagement, a three-phased ChBA down-select process, and use of a prototype OT. Each of these core strategy elements focused on communicating actively and inspiring vendors to apply new, interesting solutions to the government’s requirement. Generally speaking, any future acquisition program should interweave dynamic engagement into the chosen strategy and discover what vendors have to offer. Acquisition teams should not blindly accept all vendor recommendations, given that vendors have different motivations from the government team; however, teams should carefully consider vendor inputs. Vendors often have staff with powerful ideas that the government can leverage to its benefit.

Market engagement should focus on building trust with the vendor community. The government should be willing to share information and be open about its unknowns and its plans. Acquisition programs should move beyond paper-based approaches and emphasize verbal communication that focuses on risks, uncertainties, and new ideas. They should maintain this philosophy throughout the solicitation process and, while maintaining fairness between competitors, communicate openly and in a timely manner.

The government should build an acquisition strategy that keeps competitive pressures on vendors and gives vendors an incentive to deliver their best approaches at reasonable prices. In an outcome-oriented way, acquisition teams should communicate what innovations and ideas the government seeks and inform vendors how the government expects them to build on their competitive advantages. The government should also clearly articulate how the evaluation team will determine value.

Acquisition programs should consider using statements of need to communicate outcome-based needs, provide guide rails to assist vendors in solving a problem, and let proposers innovate inside that space. Programs can use multi-phased acquisitions to iteratively assess and address risks generated by this innovation-focused approach. Moreover, multi-phased acquisitions give vendors an opportunity to iteratively enhance their approaches and refine their price.

ChBA can represent a formidable tool to minimize risk and to inspire innovative solutions. It is particularly useful for developing new technologies, solving difficult problems, and mitigating risks early in the acquisition process. For TARDyS3, ChBA naturally fit the need, and



the multi-phased down-select process enabled the government to iteratively understand and mitigate risks. The chosen vendor gained the government's confidence through demonstrations.

Prior to any key acquisition event such as a white paper due date, a challenge demonstration, a proposal due date, or a negotiation session, the acquisition team should consider having a conversation with the vendor community. The team should use open dialogue to allay industry concerns and learn new perspectives—seek knowledge from potential vendor partners and incorporate it into the acquisition approach. In the end, vendors and the government team will have tightly aligned incentives to deliver capability and value to the warfighter; dynamic engagement and innovation centricity can maximize this value.

Conclusion

The TARDyS3 program team built transparency, openly communicated, and incentivized innovation throughout the acquisition. Injecting those core concepts improved the outcomes:

- At time of award, the vendor already deeply understood the TARDyS3 problem and had a technical team engaged in solving that problem. Additionally, the government possessed a detailed understanding of every aspect of the vendor's solution. That understanding enabled a rapid transition to prototype development and fielding.
- The trust built during early acquisition stages carried over to the execution phase, enabling a rapid progression to productive, trust-based performance.
- The government's risk-based acquisition approach mitigated many uncertainties and threats to performance prior to award.
- DISA's approach spurred industry innovation while ensuring the chosen vendor demonstrated a capability to deliver the needed product.

Each of these attributes helped ensure the TARDyS3 program quickly developed and deployed high-quality products. These principles are broadly applicable to future acquisitions, whether or not they follow the TARDyS3 acquisition model. As demonstrated by the TARDyS3 prototype experience, dynamic engagement and a focus on innovation enhance acquisition outcomes.

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