ACQUISITION INNOVATION RESEARCH CENTER

Systemic Factors Influencing Risk Aversion: Diagnosing Behaviors and Tailoring Interventions for Lasting Transformation

EXECUTIVE SUMMARY AND REPORT

JULY 2024

PRINCIPAL INVESTIGATOR
Dr. Mike Rayo, *The Ohio State University*

CO-PRINCIPAL INVESTIGATOR
Dr. Amanda Girth, *The Ohio State University*

RESEARCH SCIENTIST
Dr. Laura Maguire, *The Ohio State University*

THE OHIO STATE UNIVERSITY

SPONSORS

Office of Acquisition Policy and Innovation, Office of the Under Secretary of Defense for Acquisition and Sustainment

Air Force Installation Contracting Center, Air Force Installation and Mission Support Center, U.S. Air Force

Air Force Contracting, Office of the Assistant Secretary of the Air Force for Acquisition, Technology and Logistics

DISCLAIMER

The Acquisition Innovation Research Center (AIRC) is a multi-university partnership led and managed by the Stevens Institute of Technology and sponsored by the U.S. Department of Defense (DoD) through the Systems Engineering Research Center (SERC)—a DoD University-Affiliated Research Center (UARC).

This material is based upon work supported, in whole or in part, by the U.S. Department of Defense through the Office of the Under Secretary of Defense for Acquisition and Sustainment (OUSD(A&S)) and the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) under Contract HQ0034-19-D-0003, TO#0285.

The views, findings, conclusions, and recommendations expressed in this material are solely those of the authors and do not necessarily reflect the views or positions of the United States Government (including the Department of Defense (DoD) and any government personnel), the Stevens Institute of Technology, or The Ohio State University.

No Warranty.

This Material is furnished on an "as-is" basis. The Stevens Institute of Technology and The Ohio State University make no warranties of any kind—either expressed or implied—as to any matter, including (but not limited to) warranty of fitness for purpose or merchantability, exclusivity, or results obtained from use of the material.

The Stevens Institute of Technology and The Ohio State University do not make any warranty of any kind with respect to freedom from patent, trademark, or copyright infringement.

SYSTEMS ENGINEERING RESEARCH CENTER

AIRC ACQUISITION INNOVATION RESEARCH CENTER

STEVENS INSTITUTE OF TECHNOLOGY 1870

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLE

RESEARCH TEAM

Name	Organization	Labor Category
Dr. Mike Rayo	Ohio State University	Principal Investigator (PI)
Dr. Amanda Girth	Ohio State University	Co-Principal Investigator
Dr. Laura Maguire	Ohio State University	Research Scientist
Morgan Reynolds	Ohio State University	Graduate Research Assistant (Ph.D.)
Christine Jefferies	Ohio State University	Graduate Research Assistant (Ph.D.)

ACRONYMS AND ABBREVIATIONS

AFICC	Air Force Installation Contracting Center
AIW	Accelerating IMPActS Workshop
CO	Contracting Officer
DoD	Department of Defense
NDS	National Defense Strategy
OSU	Ohio State University
SCAD	Systemic Contributors Adaptations Diagramming
USAF	United States Air Force

EXECUTIVE SUMMARY

This report discusses the Phase II work for the Systemic Factors Influencing Risk Aversion: Diagnosing Behaviors and Tailoring Interventions for Lasting Transformation project (WRT-1081.8.4). The project was a collaboration between the Air Force Installation Contracting Center (AFICC) and The Ohio State University (OSU). The research was focused on three main objectives: 1) validate and elaborate on the model of systemic pressures faced by the acquisition workforce that impede innovative behaviors, 2) assist AFICC with a proven method of identifying and assessing high potential local innovations that had high value for scalability to other parts of the organization, and 3) build capacity within AFICC to support a culture of innovation by training personnel and developing materials to sustain an ongoing program.

As a part of these objectives, the research team conducted interviews using the Systemic Contributors and Adaptations Diagramming (SCAD) technique. Data from the SCAD interviews continued to both confirm and elaborate on the model of system attributes and pressures that was developed in Phase I, which indicate barriers and facilitators to innovation. The data validated the previous interpretations in the model showing strong representation of prior themes (see Appendix A).

Notable findings from the SCAD interview dataset include:

- Attributes reliably associated with supporting innovative acquisitions behaviors: a) making room for failure and risk-taking, b) fostering organizational learning, c) aligning team goals, d) collaborating internally and externally, and e) supporting autonomy were consistent in this data set. Organizational learning and goal alignment remained similarly cited, while creating room for failure were represented less and collaboration and autonomy showed a slight increase in representation.

- Systemic pressures that either strengthened or eroded system attributes linked to innovation were present in this dataset. These pressures were: a) procedure, b) time, c) innovation prioritization, d) workload, e) budget constraint, f) turnover, and g) reliance on routines.

- Previous pressures elaborated with new interdependencies were noted in a) turnover and b) turnover and goal alignment.

- Leadership support was previously identified as a compounding pressure and the evidence from Phase II data showed it continued to play a powerful influence on helping or hindering innovative behaviors. A new set of reported leadership support systems pressures that strengthen and erode innovation attributes includes:

  - **Availability**: Leaders are available/accessible to their team encouraging them to find solutions but providing support when needed.

  - **Feedback**: Getting more frequent feedback from leadership and customers creates opportunities to (a) realign goals across levels, (b) address and learn from issues, and (c) generate new insights and innovations.

  - **Openness**: Leadership makes it ‘okay’ not to know everything. They encourage people to ask questions and share knowledge to enable a culture of openness to learn. Leaders provide “top cover” for teams and individuals experimenting with innovative solutions.

  - **Bridging**: When the originator of an innovation leaves the team, leadership or another team member acts as a throughline for an innovation, orchestrating the handoff and providing the ongoing momentum.

- **Accounting for tradeoffs**: Goal alignment specifically on the risk vs reward tradeoff is important to getting an innovation off the ground.
- **Authority-Responsibility Alignment**: Allowing people to have flexibility and freedom to complete work they are responsible for through their own means, (i.e., more personal authority over work).
- **Goal misalignment**: One person in the right position of authority who does not share common goals can stop an innovation in its tracks.
- **Incoming orientation toward Innovation**: A change in leadership greatly impacts the goals and innovation capability of the team. (+) New leaders who have a desire to innovate can create an environment that allows more risks to be taken and boundaries to be pushed. (-) New leaders who prioritize status quo can halt previously developed innovations as new ideas.

The research team also used the practical, evidence-based IMPActS workshop to design and revise interventions that address system attributes found critical to enabling successful innovative behaviors. In a co-design process with our AFICC partners, the Accelerating IMPActS workshop evolved. We adapted the content, facilitation, and panelist selection to ensure the workshop was high value to intervention owners and panelists who were contributing to the ideas.

During the Phase II, the research team trained two Program Leads through formal training courses and weekly coaching calls, worked with three Innovators to assess and develop their ideas for broader adoption, facilitated eight panelists to provide their subject matter expertise in assessing the intervention ideas, and our Program Leads briefed several leaders throughout the project.

The team developed a series of program materials to sustain the program after the project ended. These materials included: a) marketing materials to raise awareness, b) instructional materials to support training a cohort of 'Innovation Advocates', c) templates and tools to aid in conducting interviews and analysis, and d) instructional materials and a facilitation guide for IMPActS workshop facilitators.

Our experience and findings suggest strongly that external efforts (e.g., training, coaching, research) to support novel programs like the AFICC Innovation Alliance must be synchronized with the availability of an internal Program Leader that is sufficiently motivated intrinsically (i.e., possessing a strong internal drive towards innovation) and extrinsically (e.g., aligned incentives, leadership direction), be at the right level of the organization to have sufficient understanding and connection to the relevant front line work, and sufficient latitude to make change.

BACKGROUND

The Ohio State University (OSU) team previously collaborated in 2022 with the Air Force Installation Contracting Center (AFICC) to conduct a two-stage, small-scale pilot to: (1) uncover the systemic pressures on the acquisition workforce that impede innovative behaviors; and (2) design a program that produces interventions to address these systemic contributors.

During this first phase of the study, the team conducted 15 interviews across six United States Air Force (USAF) installations using the Systemic Contributors and Adaptations Diagramming (SCAD) technique. Data from the SCAD interviews were used to create a model demonstrating the systemic pressures and constraints that influenced innovative behaviors. Factors that influenced taking innovative action and overcoming barriers to change included when the organization or leadership made room for failure, fostered organizational learning, aligned team goals, encouraged collaboration internally and externally, and provided autonomy to act. Conversely, factors that minimized innovative behavior included restrictive procedures, time pressures, and indirect innovation deprioritization. Management-led efforts compounded the influencing factors which strengthened and eroded system attributes and influenced innovation behavior.

Our first sponsor oversaw this program from October 2023 to December 2024. The second served as an interim program manager from January 2024 to May 2024. Our final sponsor led this program from May 2024 to July 2024.

PHASE II STUDY OBJECTIVES & OVERVIEW

The primary objectives for this ten-month, second phase of work was to implement a program that (1) facilitated deeper organizational understanding of the systemic contributors that support and impede innovative acquisition behaviors, and (2) facilitated the design of interventions that address these systemic contributors in order to incentivize lasting behavior changes leading to the kind of cultural change required to meet the National Defense Strategy (NDS) to block Russia and China and restore America's competitive edge.

The deliverables for phase II of the study are:

1. Department of Defense (DoD) Outreach: In collaboration with Dr. Philip Anton, met with DoD champions to build relationships with DoD stakeholders.

2. Interim Status Report. A status report that summarized the results of this first portion of work was produced and completed on February 15th, 2024. This report was briefed in the April 12, 2024 meeting.

3. Final Briefing. A PowerPoint briefing summarizing the results of the study and Phase III proposal will be submitted prior to the final briefing.

To meet these objectives, the research team collaborated closely with our AFICC partners to create the Innovation Alliance program. The core functions of the Alliance serve to provide:

1) A method for continuous monitoring to identify signals of barriers and facilitators to a healthy innovation culture within AFICC

2) A model and a tool to aid in the interpretation of the signals collected in the identification activities

3) A co-design process for supporting the transition high potential ideas to improve their implementability and sustainability at increasing scale

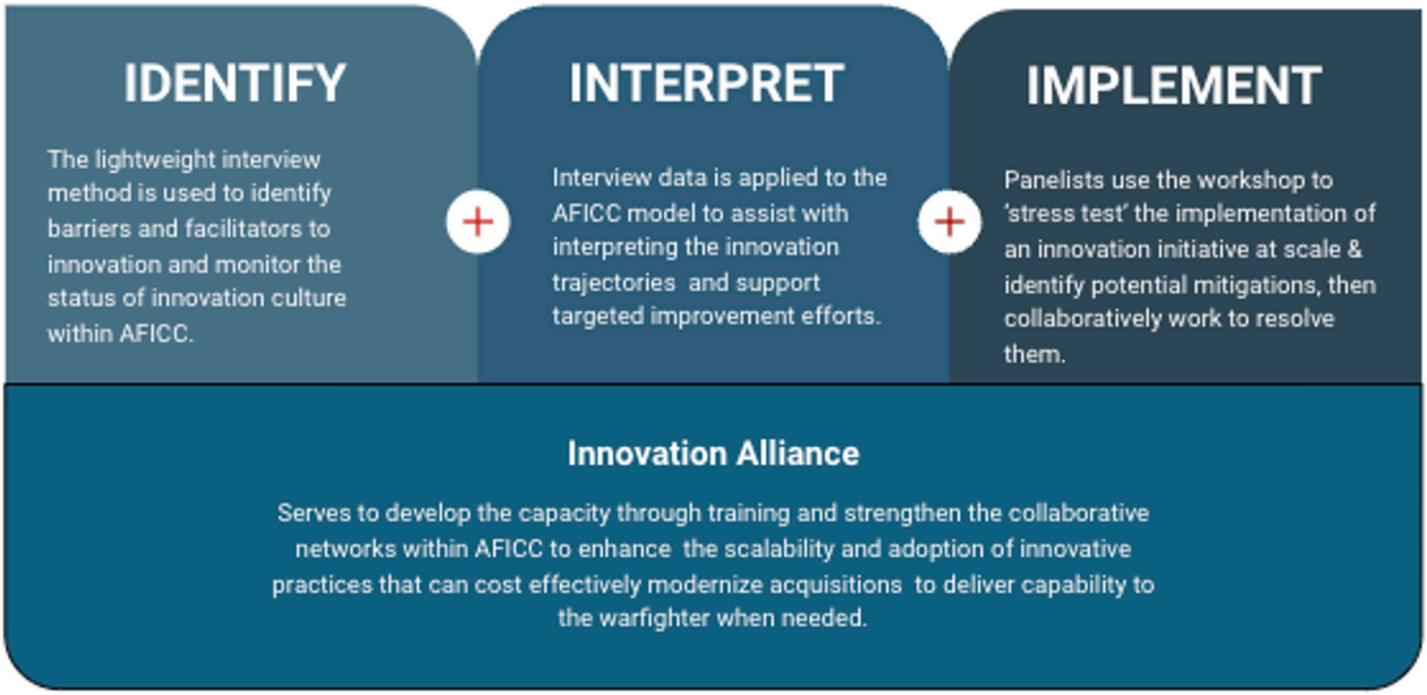

Figure 1: The Innovation Alliance program

During this period of performance, we trained two Program Leads through formal training courses and weekly coaching calls, worked with three Innovators to assess and develop their ideas for broader adoption, facilitated eight panelists to provide their subject matter expertise in assessing the intervention ideas, and our Program Leads briefed several leaders throughout the project. The activities conducted centered around interviews, analysis, and facilitation of program content.

1.1 FOCUS AREA 1: SCAD INTERVIEWS & ANALYSIS

Building off the previous analysis completed in Phase 1 of this study, we used the SCAD technique to identify situations where the acquisition workforce deviated from typical practice and innovated to accommodate situational constraints.

Table 1. SCAD interview participant employment characteristics

Positions	Phase I	Phase II	Functions
Leadership (6)	Military (1) Civilian (4)	Military (0): Civilian (1):	Contracting (3) Program Management (3)
Staff/Frontline (19)	Military (5) Civilian (5)	Military (9): Civilian (0):	Contracting (19)

DATA & METHODOLOGY

Once again, used our SCAD interview technique (Walker, Woods, & Rayo, 2016, Jefferies, Balkin, Groom & Rayo, 2022) to elicit representative experiences that revealed patterns of pressures (expectations) and conflicts (trade-offs) to validate previously identified influences on innovative behaviors. We conducted a series of interviews with members from across AFICC in partnership with our AFICC partner.

OSU researchers led the interviews with the interim AFICC Program Lead observing. Interview data revealed information that both verified and expanded on the dynamics of the pressures or expectations in the system that drive innovative behavior and standard behaviors. Following each interview, we held a short debrief amongst the interviewers to clarify any outstanding questions and capture any insights and observations from the team. The data was analyzed through iterative coding by two researchers on the project and reviewed by the Principal Investigators.

This set of interviews also served to familiarize the interim Program Lead in the interviewing process through observations. Another two interviews were conducted by AFICC Program Leads with observation and coaching from OSU researchers as defined by the See-Do-Teach model (further described in Section 1.3 Capacity Building).

FINDINGS

Data Analysis - Validation

Data from this round of interviews was analyzed and cross referenced with the previously presented model. The data validated the previous interpretations in the model showing strong representation of prior themes.

The attributes reliably associated with supporting innovative acquisitions behaviors: a) making room for failure and risk-taking, b) fostering organizational learning, c) aligning team goals, d) collaborating internally and externally, and e) supporting autonomy were consistently validated in this data set. Organizational learning and goal alignment remained consistently cited, while creating room for failure and risk dipped slightly, and collaboration and autonomy showed a slight increase in mentions.

Appendix A indicates the integrated set of reported systems attributes that support innovation along with examples from the Phase II SCAD interviews.

The systemic pressures that either strengthened or eroded system attributes linked to innovation also continued to be present in the data. These pressures were: a) procedure, b) time, c) innovation prioritization, d) workload, e) budget constraint, f) turnover, and g) reliance on routines.

Leadership support was previous identified as a compounding pressure and the evidence from Phase II data showed it continued to play a powerful influence on helping or hindering innovative behaviors.

Data Analysis - Elaboration

We were also able to elaborate the model by determining great levels of specificity around several key factors including turnover, organizational learning, goal alignment, and leadership support.

The interactive relationships between the set of reported systems pressures that strengthen and erode innovation attributes continued to be represented in the data as the narratives elicited in the interviews.

- Organizational learning was shown to be strengthened by turnover in that rotational programs increase the variety of perspectives and experiences the rotating individual gets to learn from and then take back to their team. Some practitioners also suggest this rotation and variety of perspectives (+) increases the willingness to try new ideas and take risks.

- Goal alignment was also strengthened by turnover when leadership or another team member acts as a throughline for an innovation when the originator of an innovation leaves the team by orchestrating the handoff and providing ongoing momentum.

Appendix B details the updated list of pressures and influences on systems attributes, along with examples from the Phase II SCAD interviews.

Leadership support, previously identified as a compounding pressure, was again found to be particularly important in upregulating and downregulating systems attributes. The data shows that leadership facilitates innovative behaviors by:

- Being available and accessible to team members.
- Giving frequent feedback to a) realign goals across the organization, b) address and learn from issues, and c) generate new ideas and insights.
- Making it ok not to know the answers and encouraging people to ask questions and share knowledge.
- Providing "top cover" for teams and individuals experimenting with innovative solutions.
- Sustaining innovations even when the originator has left the team. They can act as a throughline for the innovation – orchestrating the handoff and providing ongoing momentum.
- Driving teams to articulate tradeoffs to account for risk vs reward when making ambiguous decisions.

However, leadership was found to negatively influence innovative behavior when:

- A person in the position of authority that does not share common goals can shut innovation down.
- They do not give authority to create changes and an innovator with an intervention idea lacks the influence over a larger group to advocate for a new approach.

It was noted that a change in leadership greatly impacts the goals and innovative capabilities of a team both facilitating and blocking innovation. This was found to be particularly true during leadership turnover. For example, incoming leaders who:

- Have a desire to innovate can create an environment that allows more risks to be taken and boundaries to be pushed.
- Prioritize status quo can block innovations that were initiated prior to their command.

Appendix C in the Appendix includes the ways in which leadership support influences innovative behavior.

This validation and elaboration provide additional insights into the effects of management policies, concurrent interventions, and emerging environmental changes within acquisitions.

Program Development

While developing a lightweight and sustainable method to support continued interviewing and analysis discussions with our AFICC partners, two co-designed changes to the SCAD technique surrounding the purpose and content were identified.

The Purpose of SCAD Interview

The first co-designed change was in the purpose of conducting the SCAD interviews. Initially, the purpose of conducting SCAD interviews was to validate and elaborate on the model of systemic barriers and facilitators. We identified that while a general representation of the influential factors was important in the operational environment there is a significant need to connect that understanding to being able to make decisions and act on the implications of these findings. In other words, the analysis should serve a functional purpose.

We determined that the identification of systemic factors needed to be able to get a rapid sense of the innovation culture by : a) provide traceability of novel information that would allow the recipient (typically a leader being briefed) to quickly make sense of the implications for operations, b) to drive action that can avoid worsening or, conversely, to amplify these implications, and/or c) highlight when there is a need for increased monitoring to remain sensitive to a changing innovation culture.

A paradox we encountered was that to interpret the data effectively, analysts needed to have a solid grounding in systems thinking. This happens over time and with continued exposure. Given the time constraints of this round of research and limitations in the number of available interviewees, it was decided that a support tool – in the form of a spreadsheet – could serve as a guide for AFICC staff to aid efficient analysis. In this we are "satisficing" (Simon, 1956) by designing a solution that, while not as optimal as providing in-depth systems analysis training to participants, still provides a satisfactory solution that can be realistically implemented by the Innovation Alliance team.

A Focus on Current State

The second co-designed change was in the framing of the question. Initially, the interview protocol focused on any historical reference to an adaptation or innovation drawn from the participants' experiences regardless of when they occurred. To enable the SCAD technique to become a more real-time assessment of the health of innovation culture at AFICC we modified the protocol to prompt the interviewee to recall an adaptation that had occurred within the last 12 months.

Tracking pattern data over time provides an assessment of a relatively current state of the innovation culture. It provides opportunities to intervene when signals showed an adverse trend towards refraining from innovative behaviors. Conversely, this data could be used to amplify desired behaviors and more closely study areas of successful innovation.

We propose this analysis technique as the SCAD Signal Mapping technique. Innovation Advocates trained in the interviewing technique use their interview data to identify patterns by selecting from a dropdown menu pre-populated with the expanded barriers and facilitators. This data is cumulatively traced and compiled in the Monitoring Innovation spreadsheet which tallies the cumulative frequency patterns identified and maps them across time to indicate when trends are increasing or decreasing. This enables the Program Leads to brief leaders with concrete data about the trajectory and velocity of occurrences.

1.2 FOCUS AREA 2: REFINE INTERVENTIONS THROUGH IMPACTS WORKSHOP

A second primary focus of this program was to use the practical evidence-based IMPActS workshops to design and revise interventions that address system attributes found critical to enabling successful innovative behaviors.

DATA & METHODOLOGY

IMPActS captures the interdependencies of the Ideas (evidence, mechanisms) behind the interventions that we are proposing, the degree of Model alignment that stakeholders have around the ideas behind that intervention, the perceived and real Pragmatics of the intervention, the availability of the relevant Actors to implement it, and sufficient resources and effort to Sustain it. The framework helps iterate on interventions aimed at increasing motivation and reducing the cost of risk-taking behaviors, while ensuring solutions are implementable and sustainable in the organization.

FINDINGS

We tested the IMPActS workshop method with two sessions held in April and June 2024. The first was a 4 hour in-person session held on-site at Ohio State University. The second was a 3.5 hour hybrid session held on-site at Wright-Patt Air Force Base with 3 members from Space Force participating virtually via Teams. During these two sessions we experimented with co-location, duration, facilitation methods, and sequencing of the material. In collaborative debriefs with the AFICC partners and OSU research team, we employed strategies for continuous improvement to refine the content in response to the results and feedback from the session.

In the previous round of research, the SCAD interviews were used to identify innovations that could be assessed using the IMPActS workshop. We applied this same model to the first round of interviews led by OSU researchers.

The first IMPActS workshop focused on an intervention described by an interviewee that helped to minimize disruptions and increase the quality of the vendor submissions during the acquisitions contracting process. While the focus of the second workshop was on an automated tool designed to aggregate data on the contracting process.

Based on a proposal from one of our Program Leads, for the second workshop we experimented with decoupling the identification of the intervention ideas from the interview process. Instead, we were opportunistically sensitive to signals arising from other parts of the organization. This was due in part to the nature of our Program Leads' roles within AFICC. They were already tied into the network of innovators, and they readily encountered high potential ideas within their day-to-day activities including their involvement with the AFICC Innovation Rodeos and the CrossTalk community. It was identified that while innovations discussed in interviews may not be good candidates for broader implementation, many of the intervention ideas surfaced through other organizational channels could benefit from the rigorous review of the workshop format.

When speaking of the IMPActS framework, Fitzgerald (2019) states that "Solution designers and organizational stakeholders should assess where their own science-based implementations succeed and fail in comparison to the necessary IMPActS factors, and should use that assessment to navigate where to invest the appropriate resources and efforts next in order to create successful organizational impact." An important limitation was discovered in the IMPActS framework application within AFICC. While the framework provides an assessment of the intervention idea, it leaves the team with no guidance as to how to "*navigate where to invest appropriate resources and efforts*". Therefore, we developed a companion exercise to the assessment component to provide a structure to meet several needs. These were designed to elicit potential mitigations as well as other solutions and to engage the networks and capacities of the panelists. This makes practical sense – the level of knowledge and expertise in the panelists means they can critically assess the feasibility of the idea and are a generative source of potential solutions, connections, and capabilities that can be leveraged to increase the chances of a successful scaling. We called the expanded format the "Accelerating IMPActS" workshop (AIW) to differentiate from the workshop focused solely on the assessment of the ideas.

Several additional findings during this project led to refinements to the workshop format:

- The first finding was the length of the workshop should not be reduced to satisfy time constraints. To do so meant rushing through the important perspective sharing, action and mitigation identification, and solutioning that brought value to enhancing the innovation. The ideal workshop format was found to be 3 hours including a short break.

- The ideal number of participants is 4-6 including the presenter(s) but it is emphasized that the selection of participants matters greatly. The discussions are richest when the workshop panelists (those assessing the innovation) are carefully selected to represent valuable and diverse perspectives. For example, in one of our workshops, an IT specialist had been recruited as a panelist to assess a database project involving a data analysis application. They were able to provide insight into the technical requirements, security aspects, funding sources, potential workarounds to challenges faced and other highly specific details that would otherwise have been missing from the group's analysis.

- Our AFICC partners expressed a desire to have the IMPActS workshop be a lightweight session with distributed facilitation at the local level. This means that an extensive grounding in the research findings was unnecessary for the participants to be able to appropriately assess the innovation. Instead, the workshop was tailored to focus on the practical implementation.

Workshop participants commented on how much was able to be accomplished in a short period of time and on the value of bringing together multiple, diverse perspectives and skillsets to share ideas. This generated rich discussions that provided valuable context to one another. This lightweight but high value effort did not add burden to their workload but provided substantial benefit to the team proposing the innovation. It is this sharing of capacity – in taking on a follow up item or in using one's network – that can amplify the benefits of having staff participate in the workshop.

1.3 FOCUS AREA 3: CAPACITY BUILDING

The third area of focus for this project was to develop internal capacity within AFICC to *Identify* the signals representing systemic barriers and facilitators, *Interpret* their meaning relative to the behavior changes that support the desired cultural change, and rapidly *Support Implementation* of high potential innovative ideas at scale.

DATA & METHODOLOGY

The team developed a See-Do-Teach model to help participants develop sustainable skills for supporting the program beyond the duration of the project.

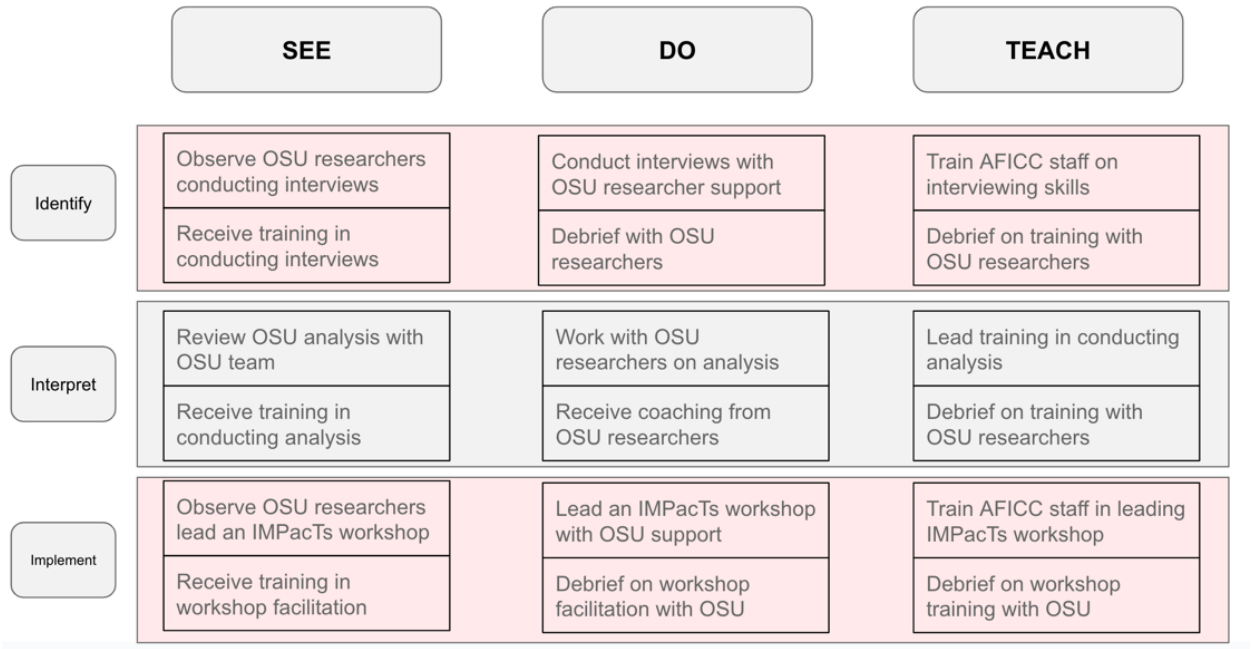

Figure 2. The Model for AFICC Capacity Building

The methods were supported by an Innovation Alliance branded set of materials designed to be used by different units within AFICC and beyond with minimal oversight or support.

FINDINGS

The initial phase of capacity building began in January with the onboarding of the Interim Program Lead. The outgoing senior sponsor was scheduled to offboard and selected a highly motivated and capable interim program lead. The Interim Program Lead began observing (the "See" phase of the capacity building) and was a valued partner in assisting the OSU researchers and providing insights. The new incoming Program Lead onboarded to the project on May 21, 2024 and work immediately began to co-design strategies and materials for program sustainment. They quickly identified a series of leadership advocates within AFICC to socialize the program. During the training period, AFICC program members were able to observe 8 interviews, conduct 2 interviews, observe one Accelerating IMPActS workshop, and co-lead a second Accelerating IMPActS workshop.

To assist with continued sustainment of the program, we developed a series of program materials to support the handoff. Program materials included:

- Awareness and marketing materials developed to support briefing of leadership and CrossTalk participants about the opportunities to participate in the program.
- Instructional materials designed to allow the Program Leads to train a cohort of 'Innovation Advocates' to carry out interviews, analysis, and facilitate IMPActS workshops.
- Tools to support conducting interviews (including a notetaking template with prompts for questions and support in summarizing the interview data for easy analysis).
- An online spreadsheet tool to capture systemic pressures and barriers for analysis and monitoring.
- A digital tracking spreadsheet to identify trends and trajectories to aid the Program Leads in identifying the current state of innovative behaviors to aid with briefing and intervention.
- Instructional materials and a facilitation guide for IMPActS workshop facilitators including checklists for planning and running the workshop and follow on activities.

The team proactively identified barriers to sustaining the program and discussed methods to overcome them in a series of co-design sessions conducted with the Program Leads and in the weekly collaboration calls. In the first co-design session held in May 2024, the group identified project risks and mitigation solutions to be jointly carried out by OSU researchers and the AFICC Program Leads. The second co-design session held in July 2024 focused on sustainment and further development of program materials. The methods employed and materials produced as a result aim to fortify the program, so it is sustainable and scalable.

2. ANALYSIS

Multiple complementary components serve to assist AFICC in recognizing agile, innovative and mission-focused business solutions developed within the ranks of the acquisition workforce. This round of research has produced an integrated, systems-oriented approach to developing AFICC personnel capacity to support innovation, providing early and often monitoring of the current state of operations to be sensitive to changing conditions to the innovation culture. In addition, this approach provides practical, scalable tools to quickly and reliably scale the capabilities to support innovative ideas at varying levels of the organization.

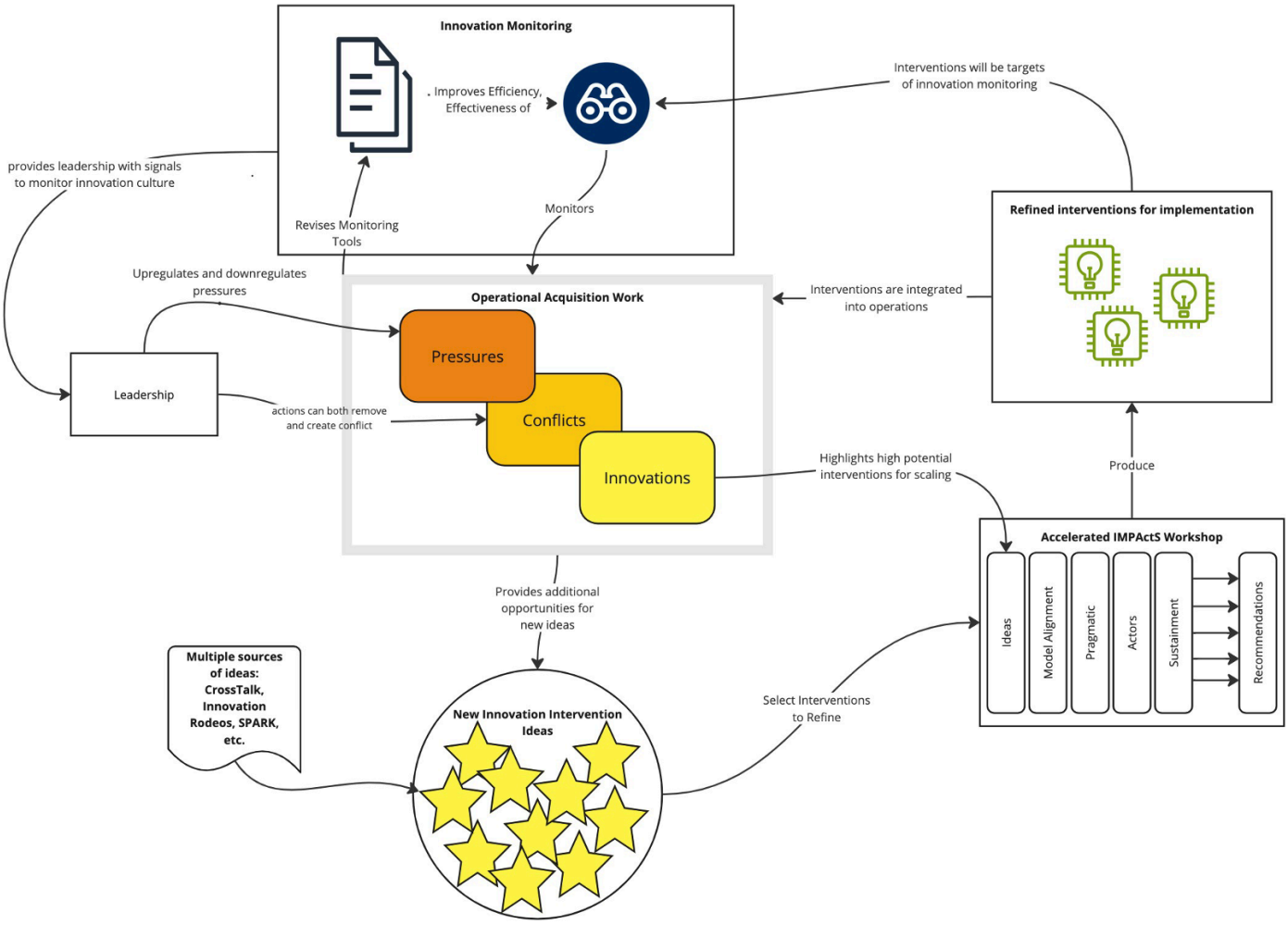

Figure 3. An Integrated Approach to Program Sustainment

The AFICC workforce that was engaged for this project were smart, sharp, and highly collaborative – representing a strong future for innovation in the U.S. Air Force. However, several factors could impinge upon the Innovation Alliance's ability to execute innovative contracting support.

Availability of Time & Workload

The AFICC personnel involved in this program expressed a keen interest in staying involved in the Innovation Alliance activities over time. However, a critical barrier expressed repeatedly was a lack of time to participate or to provide additional support to the innovation implementation efforts.

Participants indicated that they were able to easily attend a workshop where there was little to no expectation of additional workload. However, attending training and being tasked with carrying out activities to support implementation was harder to integrate into the high workload that many participants carried. Without designated time allocated to Innovation Advocates for carrying out additional tasks to supporting innovation, this program may falter.

It was further identified that providing meaningful support for the interventions assessed required dedicated resources in the form of a budget, expert support in implementing an innovation at scale, and a committed collaborative network to assist delivering the innovation across AFICC. In addition, given the often cross-cutting nature of high value interventions, it was unclear who to ask for extra resources to make the resultant intervention ideas possible.

Funding to Support Grassroots Efforts to Prepare for Scaling

Innovation, by its nature, is largely generated by an unexpected pressure or need, or in response to changing conditions. Therefore, it can be difficult to anticipate the resources needed to support innovations. The data showed that the efforts to pilot an intervention idea or develop it for a local level were typically able to be completed within an intervention owner's workload and using their local network. However, to prepare the intervention for broader scaling, intervention owners needed to expend additional efforts and required additional funds. These funds were required to handle increased user volume, develop support materials, or enhance security or quality.

3. CONCLUSIONS

The project conclusions and recommendations are listed below according to the key objectives of this project: 1) Identifying and Analyzing Signals, 2) Supporting Implementation, 3) Capacity Building, and 4) Overall Program Sustainment.

IDENTIFYING & ANALYZING SIGNALS

Having a lightweight, continuous monitoring strategy to understand the determinants of health of the innovation culture at AFICC allows leadership to recognize the direction the organization is moving to establish if innovative behaviors are increasing or decreasing. With enough frequency of monitoring, a relative velocity can also be determined to show how quickly is it increasing or decreasing. This provides the opportunity to intervene and refocus on facilitators of innovation while working to minimize the effects of barriers.

Recommendations:

- In collaboration with our AFICC partners it was identified that a target frequency of one interview per week would provide the ability to assess current state of innovation within AFICC. Best practice is recommended that interviewers pair up to conduct interviews until they have established a high degree of proficiency.
- To achieve this target, it is advised to train a cohort of four additional interviewers who are placed in rotation to conduct interviews once every 3-6 weeks (depending on pairing). This ensures that interviewing skills are kept current, a diverse collection of perspectives are included in the interpretation of the interview data, and the pool of interviewees is drawn from multiple networks allowing for the sample data to be more representative of a broader cross-section of participants. It also lightens the workload for any one individual and enables interviewers to 'trade' the timing of their interview with others when workload gets high.
- Additional research is needed to validate and refine the Monitoring Innovation assessment methodology and to assist AFICC in interpreting and acting on signals.
- Further, a protocol for applying the Monitoring Innovation assessment to specific groups could help individual leaders better understand the barriers and facilitators that may be influencing behavior of those under their command.
- An area of future work would be to develop greater capabilities and tooling to support systemic analysis within the Innovation Alliance participants to promote their ability to recognize *new* barriers or facilitators that are not accounted for in the revised model. Systems thinking is a critical skill for safely and effectively adapting work processes in real time without incurring unintended consequences.

SUPPORTING IMPLEMENTATION

This project demonstrated that there are high-potential grassroots innovation interventions being developed at a local level to quickly and effectively solve problems encountered in everyday work. AFICC can benefit from and amplify this innovative behavior through a systemic process of assessment of the interventions to determine their scalability and establish a practical, specific plan for overcoming or mitigating the identified barriers. In addition, by engaging the experiences and the networks of the panelists, more perspectives and insights from across the organization are brought to bear on addressing barriers and amplifying facilitators.

Recommendations:

- Leadership should allocate time and encourage participation in the Accelerating IMPActS workshops for a wide pool of their employees. Not only do the employees benefit by providing value to their colleague's ideas but they become aware of other unit's goals, priorities, challenges, and initiatives which helps to promote greater collaboration and goal alignment across the organization.
- Facilitators should emphasize selection of panelist participants relative to the innovation being assessed as opposed to simply who is available. The AFICC & OSU team identified the following criteria for the diversity of panelists:
  - » Representing different parts of the acquisition process, units, specialized skills or domain expertise.
  - » Those who have a network that may be relevant to the support and scaling of innovations (either through rank, experience or deployments, initiatives or committees they are involved in etc.).

CAPACITY BUILDING

AFICC has a highly skilled and motivated workforce which is well positioned to carry on this work. The systems thinking skills being developed as an Innovation Advocate are highly complementary to supporting performance in other activities for the contracting workforce. For example, the ability to elicit stories needed to interview peers help to enhance listening, comprehension, and real-time sensemaking skills. As well, the skills in interpreting patterns of systemic influences builds off an AFICC Contracting Officer's (CO) analytical skills and helps strengthen understandings of the interdependent relationships amongst the contributing factors. This can help CO's identify potential problems earlier, think more broadly about potential solutions, and more quickly and readily understand how to achieve desired outcomes for novel or unstructured problems.

Recommendations:

- Compile the program materials developed in this phase of work into a SharePoint site or other easily accessible platform to allow easy distribution of materials.
- Develop an on-going skills development program, in the form of an 'Advanced Skills for Innovation Advocates' training and self-directed job aids, that aligns with the DoD Contracting Competency Model.
- Develop a protocol for an Innovation Alliance Community of Practice Group that can be piloted to support Innovation Advocates & Innovation Owners in further strengthening a culture of innovation within AFICC.

PROGRAM SUSTAINMENT

Concerted efforts to incentivize innovation behaviors within AFICC need to be systematically supported through a programmatic approach.

Recommendations:

- Develop a campaign to promote awareness of the Accelerating IMPActS workshop and the Innovation Alliance. This enables innovators to self-select into the process and have their ideas assessed at earlier stages enabling them to adjust and adapt their approach to accommodate scaling in the preliminary stages of development. This helps young ideas get 'on the radar' of others sooner, enabling them to promote its development or identify and direct resources their way.

- Quarterly briefings should be held to brief leadership on the Innovation Assessment findings. Leadership attendance and engagement at the briefings is crucial for continued sustainment of the Innovation Alliance. Engagement includes asking meaningful questions about any trends or trajectories that may be providing early signs of innovative behaviors being embraced or avoided and actively taking steps to reduce the impact of the identified barriers to innovation while providing continued support for the facilitators.

- Considerations should be made to partner with other innovation initiatives within AFICC that have funding and/or budget should be allocated to enable the Innovation Alliance to provide intervention owners with monetary support. This is in addition to the expertise in scaling and implementing initiatives across the organization.

- The Innovation Alliance should be formally recognized as a feeder program to identify and prepare small-scale grassroots innovation efforts for involvement in a more formal initiative such as CrossTalk, Innovation Rodeos, and SPARK.

Next steps for continued work with OSU researchers should focus on the continued implementation using the program materials, such as:

- Continued expert coaching for Program Leads in using the tools and methods.

- Assisting with training of additional resources to develop capacity at the unit level to conduct Accelerating IMPActS workshops.

- Iterating on the program materials based on feedback from AFICC to continue to integrate the tools and processes as the program evolves.

- Assess the efficacy of the program in being able to incentivize innovation behaviors.

In addition to the collaboration with AFICC, it is also imperative to test these models in other DoD organizations.

APPENDIX A. INTEGRATED SET OF REPORTED SYSTEMS ATTRIBUTES THAT SUPPORT INNOVATION

Attribute name (# of mentions Ph I + Ph 2)	Definition	Example from Phase II Interviews
Creating room for failure and risk (7)+(4)	Organization encourages risks and creative solutions without fear of punishment for trying something new	P2-7: "To me, failing in a training environment is a success, right? Because you tried something and it didn't work out and you learned something. And that to me is a success... So if you have a two week training program and it bombs, okay, well run the training program again."
Organizational learning (5)+(5)	Supports institutional learning, keeps people up to date on new tools and methods, and uses past situations as a source of information	P2-2: "It was something different and new to experience, especially something that I could provide training on later saying 'Hey, we worked through this process doing this. This is how we set it up. Here's our framework. Maybe you can tailor it for your new acquisition or your new requirements, see if it would work for you.' So it was just something fresh and exciting for a lot of us."
Collaboration (5)+ (7)	Organization facilitates collaboration internally and externally with other departments and industry partners throughout a project lifespan	P2-8 "As a team, we came to a consensus because we shared all that stuff with each other. We were in an open office, five or six desks all around in one little building. That was our contracting cell at the time. But yeah, you can always reach back, especially nowadays, you can always reach back to home station. You can reach back to the network of contracting professionals that has now amassed in Facebook or on LinkedIn or in other communities like that where you can ask some of those questions and see how other people have approached situations that were similar in the past."
Goal alignment (5)+ (4)	People and groups (moving horizontally and vertically through the organization) share the same goal and understand their role in reaching the goal	P2-1 "I was speaking to the contracting officer that was going to replace me. I said, 'Hey, we're going to do contract realignment. This is how I want to do it.' He was like, 'go forth and conquer'. So going forward, I was able to get everybody online. In terms of the contractors, they were all okay with it. I got the stakeholders, so the commander and then also the other customers. I got everybody on board to do this."
Autonomy (3)+(5)	Organization allows people to have flexibility and freedom to complete work through their own means, less leadership involvement and more personal authority over projects	P2-5 "We broke out these segments of 'more or less acquisition authority'. And so we were able to get action quickly at the various levels because they knew they only had to go to one person or maybe only two people. And we tried to bring the authority as low as possible without breaking any of the rules that the Air Force said we have to, or the far said we have to. And so we pushed the authority as far down as possible."

APPENDIX B. INTEGRATED SET OF REPORTED SYSTEMS PRESSURES THAT STRENGTHEN AND ERODE INNOVATION ATTRIBUTES

Note, new pressures are bolded in the table; Phase II examples denoted with P2-#.

Pressure name (# of mentions)	How strengthens (+)/weakens (-) innovation attributes	Example from interview
Procedure (7)+(7)	Organizational learning (+/-): (+) Reducing the number of rules encouraged critical thinking and development of new skills (-) Following protocol, everything is a checklist rather than an evaluation of foundational skills and education Autonomy (+): Procedures that allow flexibility of execution encourages individualized solutions to problems Room for failure (-): Protocol provides a comfort zone that people fall back onto rather than attempting something risky	P01 (+): Leadership reduced the number of rules people needed to follow to encourage critical thinking P05 (-): "[they] drive everything to a checklist, so the people aren't focused on developing their functional skills, they're focused on checking boxes. The government is then in turn, promoting people who don't have the foundational skills, who should become the mentors of the junior people behind them." P02 (+): The FAR gave the authority to "basically do the acquisition smartly, however they saw fit, as long as it's not illegal and permissible by local policy." P13: "When something doesn't fit that norm, we're risk averse in a lot of ways, and then we try to pull it back into that process that we're all somewhat comfortable with" rather than trying to innovate
Time (6)+(8)	Organizational learning (-): Desire to go fast leads to reliance on current/old procedures Collaboration (+): Need for results in a strict timeframe encourages collaboration and communication	P01 (-): Organization's default is the "go-fast model" and relies on old procedures to make sure they reach the work requirement P02 (+): "Status quo is just sitting behind a computer and doing everything electronically… [they didn't] have that time in the acquisition schedule, however, because of X, Y, Z." and it became directly interacting with the site contractors

Pressure name (# of mentions)	How strengthens (+)/weakens (-) innovation attributes	Example from interview
Innovation prioritization (4)+(5)	Organizational learning (+/-): (+) Leads to developing critical thinking skills and seeking new information on improving current practices (-) Prioritizing innovation increases options, which can lead to an overwhelming amount of new information Goal alignment (-): The people working have a primary goal of getting work done and if innovation is overly prioritized it gets in the way of that goal Room for failure (+): The desire to innovate allows more risks to be taken and boundaries to be pushed	P13 (+): "You have to get rid of your desire to see everything one way to enable that [standardized] environment, and then you have to coach people and encourage people on critically thinking about what could be, while you also insist that they have the knowledge of what is, and that combination, I think, is where innovation is born." P06 (-): "And then you have to know, not only all of your baseline contracting stuff, but you have to know all the new innovations too, and you have to learn all the new stuff because every day it changes and we get a new national defense authorization act and it's got new rules, we get a new president and we get new executive orders that affect our contract clauses and we have to figure out how to deal with those. There's just not enough time to sit and I would say, think critically and think innovatively about what you're doing" P08 (+): "However, I like to say that in the past year, especially under the needing chief of staff with his model of accelerating change or use, things are changing. The culture is changing towards taking risk and just trying new things "
Workload (3)+(5)	Organizational learning (-): With high workload additional dissemination and educational tasks are a burden and take a lower priority Room for failure(-): High workload decreases desire to take risks because a failed risk adds more work	P01 (-): Teams show reluctance to do extra learning and market research because it's "gonna take more work, they're not giving [them] more bodies to help do that more work." P01 (-): "And we have to … any risks we have to attempt to mitigate or solve. And all of that is work, which takes time. Right? So introducing any risk that they have to address and solve is something that people generally are not, they don't want to do because it's, it's, it's more work."
Budget constraint (3)+(4)	Goal alignment (-): Unknown budgetary restrictions disrupt ability to align intentions	P2-4: "And so the added cost of that capability is not something that we'd actually be able to leverage. And so that's an example of the types of requirements and strategy pressure that the requirement owner was pushing on the acquisition team that really was degrading their ability to move forward effectively."

Pressure name (# of mentions)	How strengthens (+)/weakens (-) innovation attributes	Example from interview
Turnover (3)+(4)	Organizational learning (-): Rotating individuals through does not develop experts with a deep understanding of foundational skills **Organizational learning (+): However, rotational programs increase the variety of perspectives and experiences the rotating individual gets to learn from and then take back to their team. Some practitioners also suggest this rotation and variety of perspectives (+) increases the willingness to try new ideas and take risks.** Collaboration (-): Constant rotation of people does not support consistent collaboration Goal alignment (-): When people leave the project it's hard to get a replacement with similar goals and enthusiasm about the project **Goal alignment (+) When the originator of an innovation leaves the team, leadership or another team member acts as a throughline for an innovation, orchestrating the handoff and providing ongoing momentum.**	P05 (-): "The government foundationally has this mindset, that we build individuals by rotating them and rather than by developing experts and a deep pool of knowledge in the foundational skills and how to be a program manager" **P2-2: "... When you get people who sit in the same seat for years and years... They get comfortable within the norm. They don't want to break outside of the norm, they don't want to take the risk... Our flight chief, he was relatively new in the position- I think he was only there for a year and a half, maybe two years at this time. So, he wanted to break away from the norm and he wanted to see what capabilities we could do."** P03 (-): In IMSE and civil service, people rotate in and out and do not develop together as a team. There is no core team. P04 (-): Established a new project, but then was deployed overseas and no one pushed it forward, so the project didn't go anywhere **P2-7: "When somebody who is passionate about it leaves... if your commander doesn't say [to the new person] 'Hey, this is a mandatory thing that you're going to track and I want you to tell me that you're doing it' or 'Hey, we need to pause for an hour every Thursday to get this done', it's not going to happen because something is always going to come up and it's going to be dropped."**

Pressure name (# of mentions)	How strengthens (+)/weakens (-) innovation attributes	Example from interview
Reliance on routines (3)+(4)	Organizational learning (-): Becoming reliant on routine decreases the ability to embrace new information and processes Room for failure (-): People get attached to their way of doing things and create an environment that devalues trying new ideas	P01 (-): "Pockets of old school" believe if the process isn't broken don't fix it and actively push back against new measures. Some of the newer people embrace and encourage a departure from the old procedures P08 (-): "They have been in a base for 15, 20 years. And they've been doing something they've been doing since the 1999. And they're like, "No, hey, we've been doing this forever. So you don't know what you're talking about. We know what we're doing." And you end up encountering those obstacles when trying to improve a process or just trying something new."
Political Exposure (2)+(4)	Room for failure (-): Backlash and public scrutiny make people wary of attempting new ideas in the future	P01 (-): Failures lead to scrutiny and public backlash. "no one wants to be a headline, so that might weigh on our minds a little bit"
Reputation (2)+(7)	Room for failure (-): Fear of damaging their reputation and hurting their career makes people less inclined to take risks and try new things	P12 (-): If you can get people to trust that they can innovate "people start to emerge out of the woodwork to go try that thing they've always wanted to try but were fearful that they would get a bad reputation with leadership and that their career would stop without so much as a whim."
External events (2)+(4)	Organizational learning (+): External events push people to learn new ways of dealing with situations and can be applied to future scenarios	P11 (+): Because of the events associated with COVID they learned new lessons and applied them to future situations
Organizational relationships (2)+(6)	Collaboration (+/-): (+) Good relationships increase the likelihood for future collaboration (-) Strained relationships and lack of desire for communication decreases ability to collaborate	P07 (+): The team was successful because "they are very involved and closely aligned with my contracting team, which isn't always the case. Sometimes, you have your program managers and your contracting teams that are more at odds than they are working together. P06 (-): "There was so much bad blood between...our organization and that program, not specifically our team, but just in general, they did not want to hear pretty much anything we had to say. They were done with us, so that was really the barrier there."

APPENDIX C. LEADERSHIP SUPPORT ATTRIBUTES FOR SUPPORTING INNOVATION BEHAVIORS

Leadership Support name	Definition	Example from interview (Phase 2 Participant #)
Availability (3)	Leaders are available/accessible to their team encouraging them to find solutions but providing support when needed.	P2-7: "A lot of times in contracting, I find that we're behind this weird wall of 'don't come in here', but the best way to do contracting is to integrate your team and to be accessible to them. I mean, not to the point where it's harmful, obviously, but to answer the call."
Feedback (2)	Getting more frequent feedback from leadership and customers creates opportunities to (a) realign goals across levels, (b) address and learn from issues, and (c) generate new insights and innovations.	P2-5: "And we also had a really robust inspection program... where we would do monthly inspections instead of quarterly inspections or annual inspections. We would do monthly inspections on the contracts so we could find where those pain points or those issues were more quickly and then address them and then fix 'em. So the feedback loop was very short, which gave us that flexibility to bring the authority down even lower because we're correcting issues quickly, and then we can then give people more authority based on them operating at the right cadence and doing things the right way. "
Openness (3)	Leadership makes it 'okay' not to know everything. They encourage people to ask questions and share knowledge to enable a culture of openness to learning. Leaders provide "top cover" for teams and individuals experimenting with innovative solutions	P2-3: "It's okay to not know. You can be in contracting for 30 years and stuff is changing all the time. New platforms are introduced, new directives are dropped, everything. So if you don't know and you're scared to ask questions, you probably won't have a good time in contracting... And even if you just ask somebody a question five minutes ago and you don't want to bother them, you don't want to feel like you're bothering them, go bother them, understand they were in your shoes and they still are in your shoes, I'm sure" P2-8: " The contracting office chief that I fell under... was extremely protective of her contracting officers that served under her. This was my first deployment. It was my first joint environment, the first time exercising contracting officer warrant, and she knew all that, and she made sure that the entire office felt like they were getting that top cover that they needed in order to provide the types of services that we offer. That is the role of a commander is to make sure that everybody below them can execute the mission without being pulled all over the place and having to justify some of their decisions."

Leadership Support name	Definition	Example from interview (Phase 2 Participant #)
Bridging (4)	When the originator of an innovation leaves the team, leadership or another team member acts as a throughline for an innovation, orchestrating the handoff and providing the ongoing momentum.	P2-7: "I'll tell you anything can drop off… when somebody who is passionate about it leaves, but you'll see that everywhere. So if your commander doesn't say [to the new person] 'Hey, this is a mandatory thing that you're going to track and I want you to tell me that you're doing it' or 'Hey, we need to pause for an hour every Thursday to get this done', it's not going to happen because something is always going to come up and it's going to be dropped. If it's not a priority for whoever is leading, that's where it dies because our people are over inundated."
Accounting for tradeoffs (3)	Goal alignment specifically on the risk vs reward tradeoff is important to getting an innovation off the ground	P2-5: "There was charts and graphs where I compared base rates, and then the rates that we wanted to do. And we'd already worked with this company on various contracts prior to, and we had some historical data as well on what those costs were. And I was able to extrapolate, here's what we've paid before, here's base rates, here's what we want them to do now, and it's a combination of these which makes up this price. It's really risky, So yeah, I think 40% is worth this one time thing. We were able to justify it well enough. And the commander, the overall approver was willing to accept the amount of risk that we articulated and we mitigated as much as possible, but he was able to accept the amount of risk and thought it was an appropriate execution method for what we were looking for."
Authority-Responsibility Alignment (6)	Allowing people to have flexibility and freedom to complete work they are responsible for through their own means, (i.e., more personal authority over work).	P2-5: "I think we really were able to shine [because] our commanding officer for the unit authorized well. He would give us his intent and then he would give us the authority at the lowest level possible to make the competent decisions. And so that really drove us to be able to make these critical, flexible, agile mission executing decisions because we were given the authority to do so…We were a very flat organization, and so we didn't have to really ask for much permission because he already gave us the intent and authority, and if we needed something for him to approve, then we would, but nine times out of 10, we would just make the decision based off of what his intent was, we were doing something that got after what the overall mission was. That's where we had a lot of flexibility and authority."

Leadership Support name	Definition	Example from interview (Phase 2 Participant #)
Goal misalignment (4)	(-) One person in the right position of authority who does not share common goals can stop an innovation in its track	P2-8: "You have other leaders sometimes, and I'm talking leaders at the tippy top and all the way down to lowest middle management that are more risk averse than others, because that's just how they were brought up. That's just how they've always done it without understanding, with forgetting, I guess, that you have a lot of flexibility if you just know where to look."
Incoming Orientation toward Innovation (3)	A change in leadership greatly impacts the goals and innovation capability of the team. (+) New leaders who have a desire to innovate can create an environment that allows more risks to be taken and boundaries to be pushed. (-) New leaders who prioritize status quo can halt previously developed innovations as new ideas.	P2-2: "And our flight chief, he was relatively new in the position. I think he was only there for a year and a half, maybe two years at this time. So he wanted to break away from the norm and he wanted to see what capabilities we could do. And so that's what brought upon the idea of with a simple project such as a demolition to try to do an IFB to see if it's possible to see if we have a market around us that would be able to provide vendors or solicit bids and stuff like that." P2-8: "I think some of it is, again, experience based people's history, their history and what they've experienced, what locations they've been to, what different types of office environments they've been to. I had had mentioned earlier I had that major, she was very protective, but she allowed us to actually utilize our tools."

REFERENCES

Fitzgerald, M. (2019). The IMPActS Framework: the necessary requirements for making science-based organizational impact. (Electronic Thesis or Dissertation). Retrieved from https://etd.ohiolink.edu/

Jefferies, C. M., Asher Balkin, E., Groom, L., & Rayo, M. F. (2022). Developing Systemic Contributors and Adaptations Diagramming (SCAD): systemic insights, multiple pragmatic implementations. Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 66(1), 75-79. https://doi.org/10.1177/1071181322661334

Simon, Herbert A. (1956). "Rational Choice and the Structure of the Environment" (PDF). Psychological Review. 63 (2): 129–138. CiteSeerX 10.1.1.545.5116. doi:10.1037/h0042769. PMID 13310708. S2CID 8503301

Walker, K. E., Woods, D. D., & Rayo, M. F. (2016). Multiple Systemic Contributors versus Root Cause. Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 60(1), 264–264.