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Innovating National Security: Models, Methodologies, and Unbound Potential
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A Qualitative Exploratory Study of the Methodologies Used to Measure Technology Maturity in DoD Non-ACAT 1 Programs

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AGENDA

- Introduction
- Problem Statement
- Purpose Statement
- Significance of the study
- Research question
- Methodology
- Participants
- Results
- Analysis
- Limitations
- Recommendations
- Conclusions & Implications

PERSONAL INFO

- Commander, United States Navy
  - Supply Officer (2005-present)
- D.B.A., Business Intelligence
  - Marymount University (2025)
- Project Management Professional (PMP) (2023)
- M.S., Information Systems Management
  - Florida State University (2022)
- M.B.A., Acquisition and Contract Management
  - Naval Postgraduate School (2015)
- B.A., Economics
  - University of Florida (2002)

INTRODUCTION

Exploring methodologies used to measure technology maturity in DoD non ACAT 1 programs.

An exploratory qualitative research effort utilizing case studies

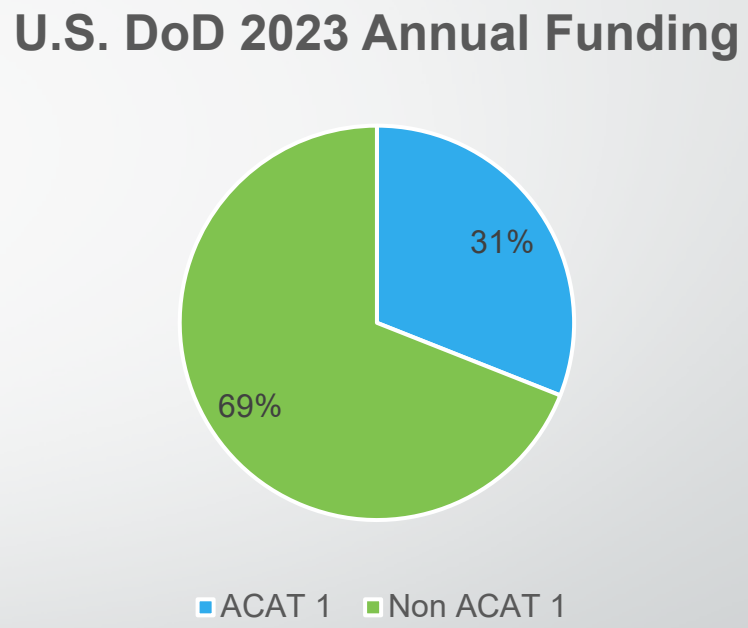
BACKGROUND INFO

- Acquisition Category (ACAT)
  - ACAT 1 - >$3B
  - ACAT 2 & 3 - <$3B

- Technology Maturity - the given technological readiness level of a program or system as defined by an evaluation process, such as a Technology Readiness Assessment

- Technology Readiness Assessment (TRA)- a formal, metrics-based process and accompanying report that assesses the maturity of critical hardware and software technologies

- *TRAs not mandated by DoD in ACAT 2 & 3 programs*



PROBLEM STATEMENT

The lack of any standardized or codified technology readiness assessment on the majority of acquisition programs allows for increased risk in cost, schedule, and performance overruns, all potentially resulting in increased taxpayer costs and decreased readiness.

(Government Accountability Office, 2019)

As new threats in the global landscape emerge and evolve, the DoD's programs will become increasingly reliant on technology, and accurate readiness assessments of that technology will be critical.

PURPOSE STATEMENT

The purpose of this **qualitative case study** is to identify and compare different methodologies previously and currently used by participants in non-ACAT 1 programs to assess technology maturity. The targeted population will consist of **Defense Acquisition University (DAU) staff** located throughout the United States who have participated in DoD non-ACAT 1 programs. This population is appropriate for this study because DAU recruits faculty from all departments of the DoD with acquisition experience to serve as instructors and staff at their physical locations and for online instruction. As identified by the GAO, **technological readiness assessments executed inaccurately result in increased risk in cost, schedule, and performance overruns for DoD acquisition programs** (Government Accountability Office, 2019). The implication for positive program execution includes the potential to **identify commonality amongst methodologies and provide a set of best practices to measure technology maturity** for future alternative analysis.

SIGNIFICANCE OF THE STUDY

- May be used to contribute to the body of knowledge for DoD ACAT 2 and 3 programs, both at the individual service and overall department levels as well as academic institutions.
- Extensive search of the literature:
  - Failed to reveal any guidance or recommendations specific to assessing technological maturity for DoD ACAT 2 and 3 programs
  - Failed to reveal the impact of inaccurate technological maturity assessments specific to the performance of DoD ACAT 2 and 3 programs
  - Found >90% of research found focuses on MDAP (ACAT 1 programs)
- Benefits to:
  - Current DoD ACAT 2 and 3 program participants
  - Acquisition research institutions (i.e. DAU)
  - Military services overseeing ACAT 2 and 3 programs

RESEARCH QUESTION

- What methodologies are used to measure technology maturity in DoD non ACAT 1 programs by those personnel conducting an Analysis of Alternatives?

Additional data points for analysis via demographics questions:

- Respondents' service affiliation
- Respondents' acquisition experience (years, position)
- Respondents' association with failed programs

METHODOLOGY

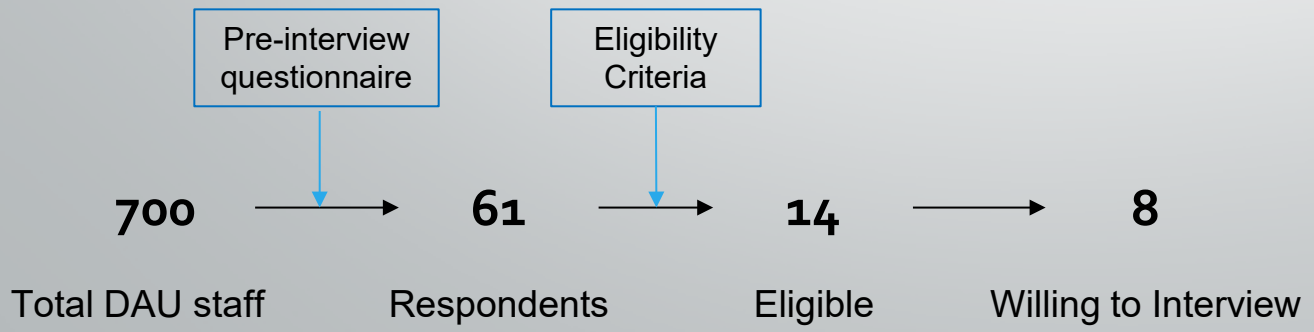
- Qualitative Exploratory Study
- Data triangulation:
  - Interviews (8)
  - Government and Academic Research
  - Focus Group
- Conduct Analysis (Atlas.ti)

Little to no sources supporting ACAT 2 and 3 research = **RESEARCH GAP**

GOAL: Identify themes, relationships, and commonalities

PARTICIPANTS

- Limited to DAU staff
- Participants identified via pre-interview questionnaire
  - Criteria:
    1. Currently or previously assigned to a DoD acquisition position or involved in a DoD acquisition program
    2. Assigned to a DoD non-ACAT 1 program
    3. Wholly or partially responsible for assessing the technological maturity of a potential solution for a non-ACAT 1 program



Participant	DoD Experience (years)	DoD Service Affiliation	Current Paygrade
Interviewee 1	30	U.S. Army	GS-15
Interviewee 2	25	U.S. Air Force	GS-14
Interviewee 3	12	U.S. Navy	GS-15
Interviewee 4	37	U.S. Air Force	GS-15
Interviewee 5	44	U.S. Army	GS-15
Interviewee 6	36	U.S. Air Force	GS-15
Interviewee 7	44	Other (DCMA, DCAA, DAU, etc.)	GS-15
Interviewee 8	17	U.S. Air Force	GS-15

INTERVIEW QUESTIONS

1. What methods were used to assess the technological maturity of the solution alternatives?
2. Was the outcome of the program considered successful?
3. Was the solution alternative with the highest assessed technological maturity selected?
4. What reason/rationale was provided for selecting a solution alternative with a comparatively lower maturity level?
5. What methodologies would you recommend for assessing the technological maturity of potential solutions during an Analysis of Alternatives for DoD non-ACAT 1 programs?

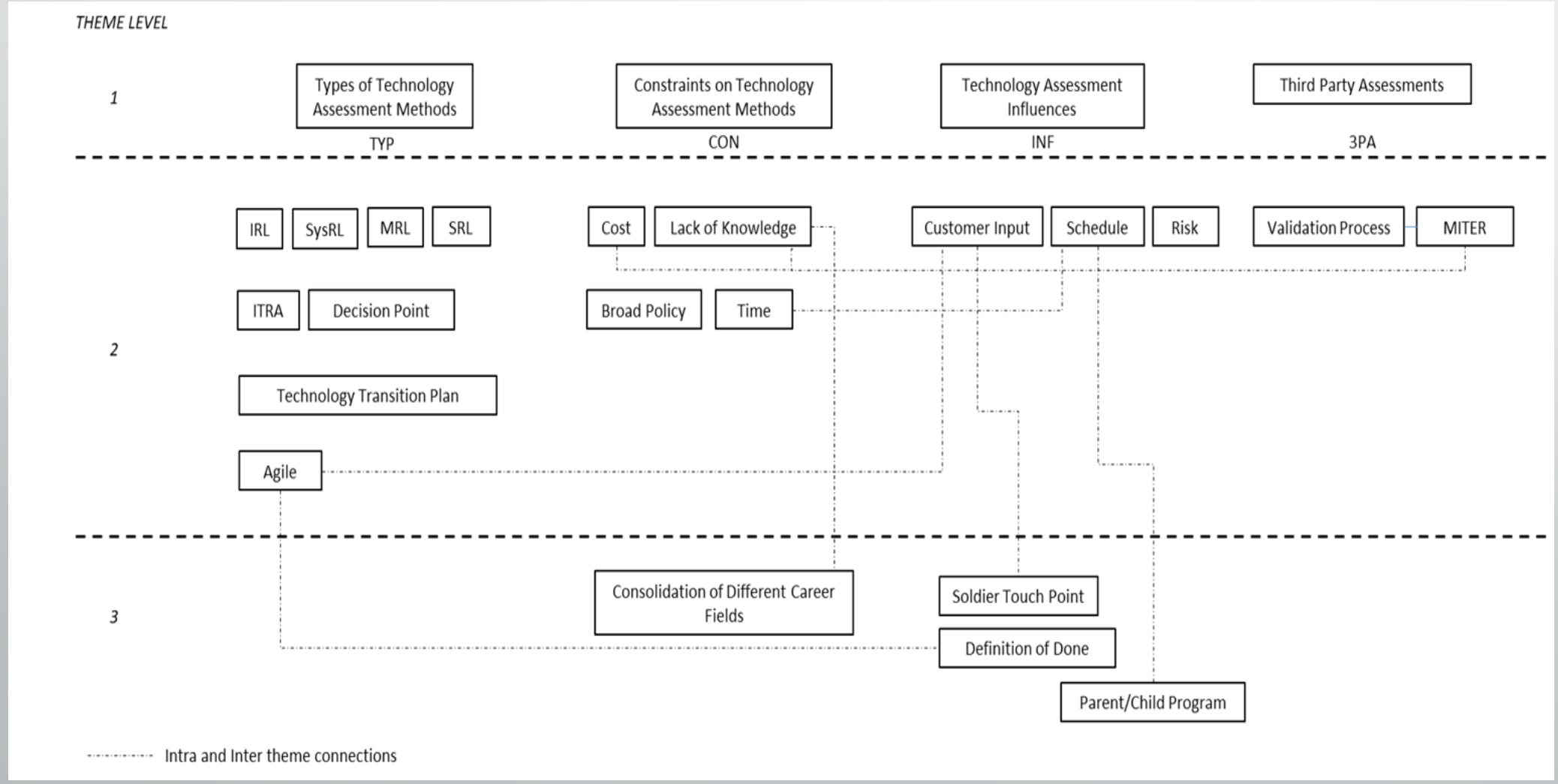
RESULTS

Initial Coding Themes

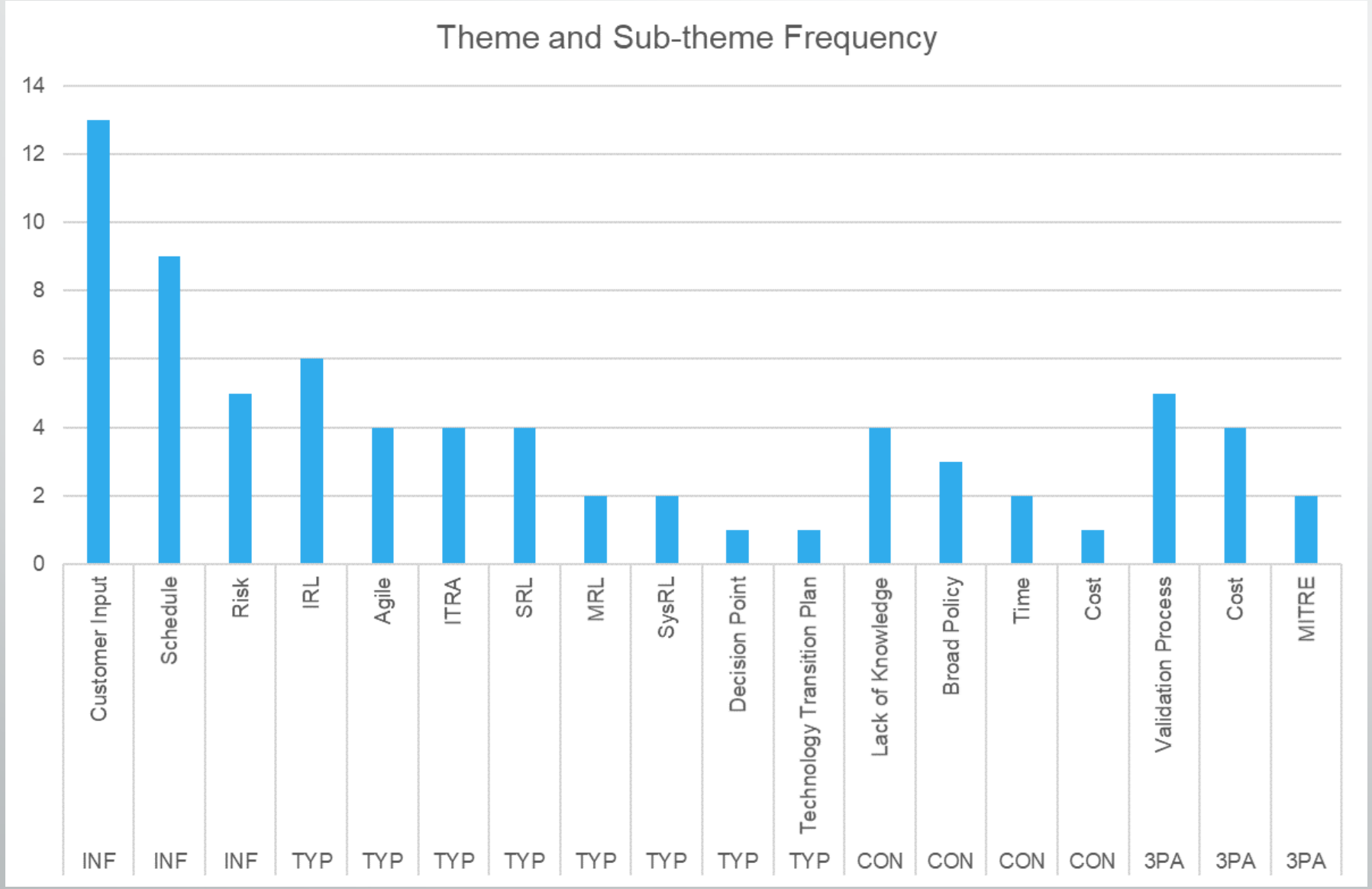
Theme	Code	Description
Types of Technology Assessment Methods	TYP	Referenced types of assessments used in DoD acquisition programs
Constraints on Technology Assessments	CON	Factors affecting the execution of assessments
Technology Assessment Influences	INF	Organizations, factors, and elements that influence assessments
Third-Party Assessments	3PA	Organizations conducting/factors affecting third-party assessments

RESULTS (cont.)

Final Coding and Relationship Structure



RESULTS (cont.)



ANALYSIS

- While the Literature Review yielded numerous methods, the interview data supporting the research question revealed eight distinct methods, *only one recounted as used in a DoD non-ACAT 1 program (Agile).*

- The high frequency of Agile and Customer Input themes within the data reflects the *DoD's transition to a greater focus on incorporating user input into maturity assessments. (Soldier Touch Point)*

- Interviewee data, government reporting, and academic research *all support the transition to more robust assessment methods* for DoD acquisition as programs become increasingly interconnected and complex

- The lack of experiential data for actual usage of technology maturity assessment methodology in DoD non-ACAT 1 programs suggests *constraints exist in executing assessments* in these programs. This theme is further supported by the interviewee data, which provides specific instances of constraints affecting assessment execution.

ANALYSIS (cont.)

…DoD's transition to a greater focus on incorporating user input into maturity assessments.

- *The Department of Defense has a user experience problem.*
  Hannah Hunt, The Atlanticist (1 APR 2025)

- *Pentagon CIO launches new office to strategically enhance customer experience*
  Brandi Vincent, DefenseScoop (24 JAN 2024)

- *DoD prioritizes IT user experience.*
  Alexandra Lohr, Federal News Network (9 MAY 2023)

LIMITATIONS

- Interviews limited to DAU personnel
  - All services of DoD included
  - Interviews do not include other federal non-DoD services
- Assumes honest answers from participants
  - No way to validate answers
- Did not account for personnel employed by multiple services

RECOMMENDATIONS

1. Quantitative studying comparing technology assessment method and program execution (cost, schedule, performance) in non-ACAT 1 programs

   This research could help establish quantitative data on the effects of assessment methods for these defined factors, standard metrics used by the DoD to evaluate program performance.

2. Qualitative study collecting interview data from active DoD program participants

   Enlarging the sample population ensures a more accurate representation of the different services and various types of programs at the ACAT 2 and 3 levels.

3. Qualitative or quantitative study of the utilization and effectiveness of third-party technology maturity assessments

   The research could analyze the different methods and/or compare the effect these methods have on acquisition program performance. Further research could compare the accuracy and effects of assessments conducted by program personnel versus those conducted by an independent entity.

CONCLUSIONS & IMPLICATIONS

- Research suggests:
  - little to no commonality or framework for conducting technology maturity assessments at the DoD level for non-ACAT 1 programs despite growing governmental and academic research indicating the significance of these assessments
  - the ineffectiveness of the TRL method, which is mandated for ACAT 1 programs and can be utilized in non-ACAT 1 programs, and highlighted the increased need for more comprehensive assessment methods
  - Significant literature and research gap in technology maturity assessment execution in non-ACAT 1 programs

…increased risk in cost, schedule, and performance overruns

QUESTIONS/COMMENTS