ATC DE/DT Project Update
Aug 2023
Gaylord National Harbor

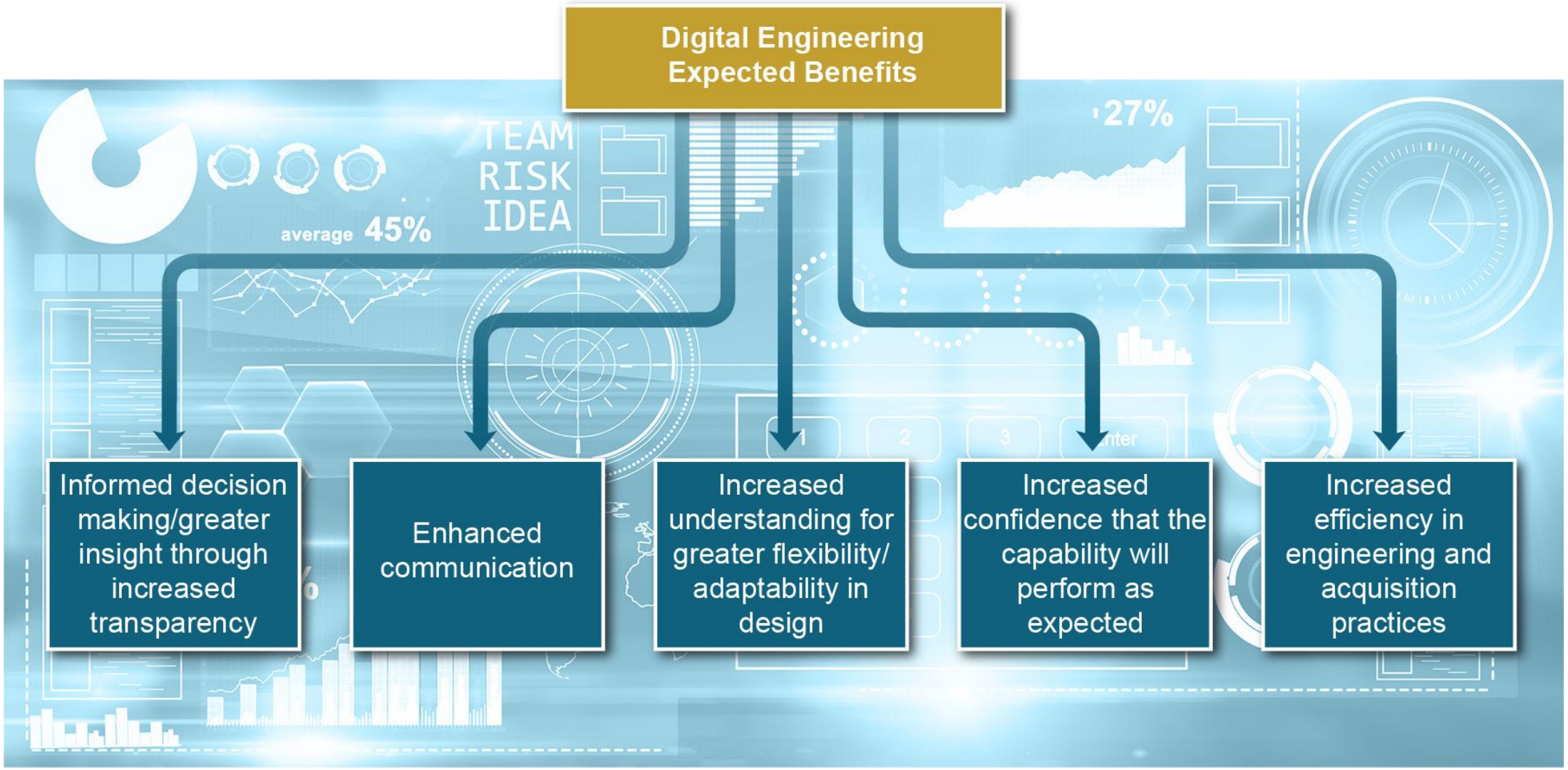
Problem Statement

Driving force behind project was presentation at 2022 ATC Plenary Session

- The DoD and the ATE industry needs faster and less expensive methods to develop, deploy, and sustain automated test solutions.
- The DoD Digital Acquisition mandate is pressuring government acquisition organizations to emplace processes that deliver digitally acquired digital products.
- The industry lacks definition of the digital acquisition process as it relates to ATE and Digital Engineering / Transformation.
- What is the current state of industry to support an ATS Digital Product Model and Acquisition?
- What are the insights Industry may provide to support our DoD ATS partners with their Digital Engineering and Acquisition needs?

Deliver a document for DoD reference that provides insights into the ATS/ATE Defense Industry's capabilities and potential improvements to support Digital Acquisition and the necessary execution of Digital Engineering and Digital Transformation.

Digital Engineering Expected Benefits



Source: U. S DoD, Digital Engineering Strategy, June 2018

DoD Automated Test Systems (ATS) Goals

- Reduce ATS total ownership cost by minimizing the proliferation of unique test systems and standardizing on designated ATS families.
- Reducing ATS logistics footprint enhancing warfighter's ability to rapidly deploy support in the modern conflict scenarios
- Improving quality of diagnostics and fault isolation reducing time to test, repair and return to service failed systems.
- Creating ATS interoperability/transportability within and across Services.

Note: DoD Automated Test System Executive Directorate Office, 7 Mar 2023; USAF Management Board Chair, Mr. Scot McClain

Project Mission and Goal

- Mission: Provide NDIA with a paper/presentation on where test industry is on this subject

  Provide recommendations to the government on how the ATE industry can support Digital Engineering and Digital Transformation, specifically the process, approaches, models, tools, and standards by which the automated test equipment and test programs are developed, acquired, and maintained through Digital Acquisition.

- Goal: Indicate the state of Model Based System Engineering tools and processes within the Automated Test Industry and the Standards used by this industry, along with expectations from government on DE/DT and the Digital Acquisition process.

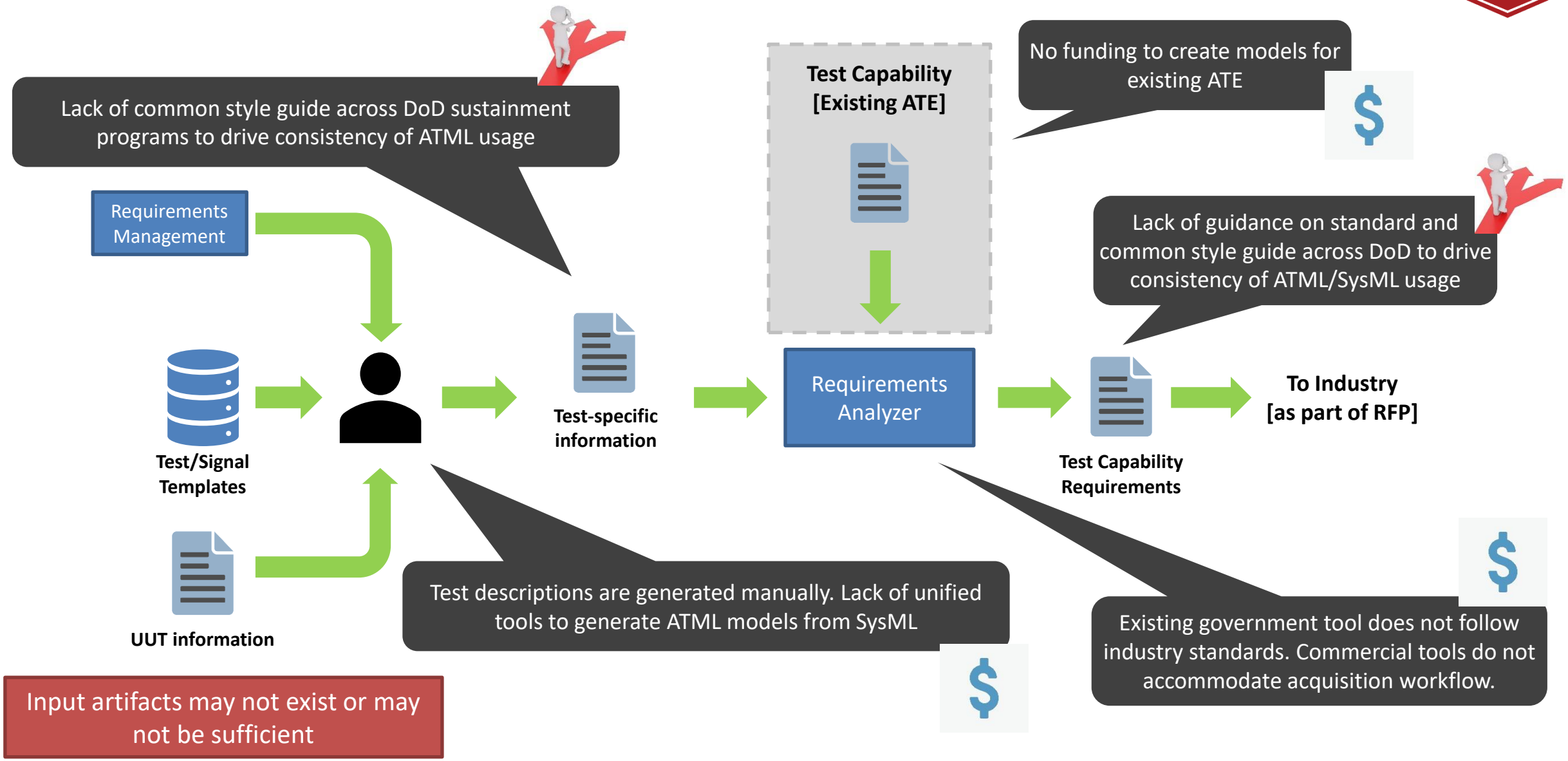
Help the government understand/gauge industry's response to a digital acquisition using MBSE, tools and the standards by which to convey the digital product.

Status/Update

- **Meet bi-weekly with individual committees meeting periodically out of cycle to work on committee assignments to progress project mission.**
- **Primary results presented in AUTOTESTCON NDIA Digital Engineering panel discussion.**
  - Processes & Tools and Standards provided significant industry insights to include DE across UUT Life Cycle, a Digital Acquisition Workflow, review of Modeling standards used by DoD and industry and Gaps as perceived by the committee.
  - Life Cycle Support and Logistics has more questions currently than answers to key DoD questions on the digital Life Cycle. But, it is understood that industry is seeing benefits by digital change to design/documentation and propagation through the technical data packages, documentation and training
  - Cybersecurity and ATS strategy are driven by CMMC 2.0 and NIST 800-171 compliance. POAMs still likely short term instrument to achieve Authority to Operate in DoD Operational environments and the Test Stands are non-networked (standalone). Guidance for cloud solutions and networked data storage not pressed for solutions currently driving delays in strategy for networked/cloud ATE solutions in DoD.
- **Next steps are to consolidate results from current efforts updating current document outline.**
- **Create first draft of deliverable document by end of year.**

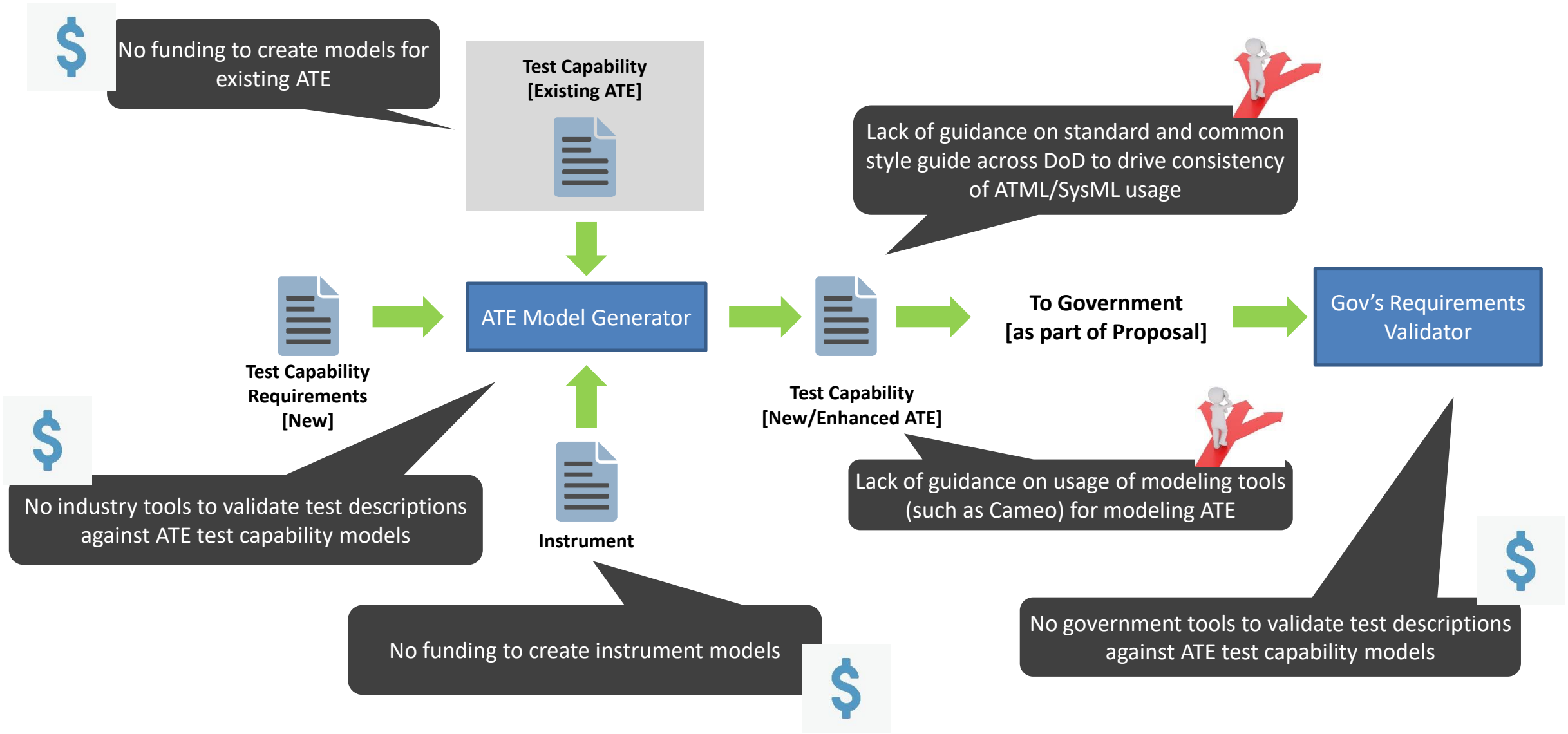
Digital Acquisition Workflow – Gaps

DoD Pre-acquisition Process



Digital Acquisition Workflow – Gaps

Industry Response to RFPs (Proposal Generation)



Summary & Recommendations

- **Develop common style guide for ATML/SysML usage across DoD (sustainment) programs**
- **Supply guidance on preferred tools (such as Cameo or other) for modeling ATE & instruments**
- **Provide funding vehicles for**
  - ATE system models & instrument models
  - Digital engineering environment able to accommodate multiple data formats as defined by the digital acquisition workflow
  - Industry tools to analyzer and validate test requirements models against ATE test capability models

Aspirational Outline of Project Deliverable

1. Executive Summary

2. The Digital Engineering / Digital Transformation (DE/DT) Project
   DE/DT Definition
   Why it's important to the industry. What's the vision?

3. Automatic Test System Workflows
   Contracting and program management – Exchange of technical data, requirements definition & traceability, costing, schedule, etc.
   Technical – Design, documentation, sustainment, operational data management and analytics
   "Specialty Engineering" – Reliability, Maintainability, Testability, Producibility, Human Factors, and Safety

Project Deliverable Outline cont.

4. Process/Digital Tools (and gaps) for accelerating and automating workflows
5. Data Storage/Cloud and Cybersecurity for Digital Transformation and Acquisition
6. Life Cycle Support, Sustainment and Logistics Considerations
7. Conclusions. Next steps. What's needed in industry to realize the vision?
8. Acronyms
9. DE/DT working group members

Initial Draft of Exec. Summary

The *Digital Engineering / Digital Transformation Project* (commonly referred to as DE/DT) was started in the latter part of 2022. The *NDIA DE/DT Working Group* was established to perform the project. The ATS AMB has provided project management and coordination among the Air Force, Army, Marine Corps, and Navy participants. In addition, many industry representatives have participated.

The mission of the *DE/DT Project* is to provide recommendations to the government on how the ATE industry can support Digital Engineering and Digital Transformation, specifically the process, approaches, models, tools, and standards by which the automated test equipment and test programs are developed, acquired, and maintained through Digital Acquisition. Potential savings will be quantified through demonstration.

A primary deliverable product from the DE/DT project is this document setting forth the committee's recommendations on how industry and the DoD will use digital modeling to design and maintain ATE. This document is intended to be used by DoD acquisition programs and will be maintained by the ATS ATC.

Some Definitions for Common Ground with Project

- Digital Engineering

  Using Under Secretary of Defense for Research and Engineering (https://ac.cto.mil/digital_engineering): "*Digital engineering is an integrated digital approach using authoritative sources of system data and models as a continuum throughout the development and life of a system. Digital engineering updates traditional systems engineering practices to take advantage of computational technology, modeling, analytics, and data sciences*."

- Digital Transformation (varied inputs, all themes from DoD strategy for a fully digital environment and acquisition process)

  Digital transformation is the adoption of digital technology by an organization to digitize non-digital products, services or operations.

- Digital Acquisition (in alignment with adoption of Digital Transformation and providing digitized products)

  Process of using digitally described products, that includes detailed digital models of the products for procurement, sustainment, and management of the product life cycle.

- Model Based System Engineering (MBSE): INCOSE defines MBSE as the formalized application of modeling to support system requirements, design, analysis, verification and validation of activities beginning in the conceptual design phase and continuing throughout development and later life cycle phases.