Systems Engineering Division - Automatic Test Committee (ATC) Spring Meeting Projects Discussion Item

Digital Engineering (DE) / Digital Transformation (DT)

- What does DoD want to accomplish with DE/DT?
- How does DE and DT impact future automatic test systems?
- Are DE and DT requirements a boon to the test industry? Or a curse?

Examining the Four Questions Submitted by USAF

- Received answers and additional questions to explore.

Digital Engineering (DE) / Digital Transformation (DT)

What does DoD want to accomplish with DE/DT?

- DoD requires ATS government groups to act on DE Strategy.
- Is more than one outcome needed?
- What are the multiple outcomes desired by ATS government groups?
- How will DE/DT fit into your workflow?

What is the impact of DE and DT *as they relate to automatic test systems*?

- Are there similar or different viewpoints for each DoD service?

Digital Engineering (DE) / Digital Transformation (DT)

Implementing DE and DT for automatic test systems

- **Is it worthwhile to use standards? Where, what and how are the standards implemented?**
  - Standards are necessary for complex ATS applications that are meant to encompass multiple stages of a systems lifecycle.
  - Standards can add cost to sustainment of simple systems.
  - Existing standards may be insufficient to support DE / DT requirements

- **Key considerations during the RFI/RFP and the awarded contract stages**
  - Scope of project and anticipated life cycle sustainment requirements must be identified prior to or as a part of the RFP.
  - The critical component for lifecycle sustainment is dependent on the quality of UUT data associated with the ATS. Without sufficient information, obsolescence or upgrade complexity make the job impossible.

Examining the Four Questions:
Understanding the current state of the industry

1. What is the current ability of the industry to deliver digital models (and/or for simulation) for ATS?

2. What is the current ability of the industry to collaborate in a digital environment?

3. Would industry be able to respond to solicitations requiring digital acquisition?

4. How does industry think the USG can best make use of Digital Engineering in future acquisitions?

Examining the Four Questions: Understanding the current state of the industry

1. **What is the current ability of the industry to deliver digital models (and/or for simulation) ATS?**
   - Do-able, but very costly, - requires high-fidelity, **ACCURATE,** simulation models of ATE instruments, run time SW, other ATE software, and UUTs
   - Signal-level simulation models may be less costly and allows for a simulated TP or simulated UUT models. Proof-of-concept has been limited to date. Can be supported by ATML standards.
   - The test requirement document (TRD) of the UUT can be used to provide capability models, with signal paths and switching needed to support a range of measurements available by the ATE/ATS.
   - Some ATS companies have developed models for use in their factories or for customers.

2. What is the current ability of the industry to collaborate in a digital environment?
3. Would industry be able to respond to solicitations requiring digital acquisition?
4. How does industry think the USG can best make use of Digital Engineering in future acquisitions?

Examining the Four Questions: Understanding the current state of the industry

1. What is the current ability of the industry to deliver digital models (and/or for simulation) of its items?
2. **What is the current ability of the industry to collaborate in a digital environment?**
   - How does the industry collaborate now?
   - Protection of industry IP is always a concern / potential impediment
   - Collaboration will not be easy unless specific direction is given in the RFP
   - ATE/ATS models are meaningless (no apparent benefit to the DoD) without the UUT models.
   - Test result feedback is missing today. Without feedback, how can the model grow? Be accurate?
   - Standards allow the T&M industry to collaborate. However, implementation of a standard is often sub-optimal or modified and becomes a funding and schedule obstacle to the DoD project.
3. Would industry be able to respond to solicitations requiring digital acquisition?
4. How does industry think the USG can best make use of Digital Engineering in future acquisitions?

Examining the Four Questions: Understanding the current state of the industry

1. What is the current ability of the industry to deliver digital models (and/or for simulation) of its items?
2. What is the current ability of the industry to collaborate in a digital environment?
3. **Would industry be able to respond to solicitations requiring digital acquisition?**
   - Yes, depending on the specificity of the digital acquisition deliverables
   - Avoiding the pitfalls of what DoD might receive requires very specific RFP language to reduce the risk of misinterpretation (receiving products that don't meet project goals)
   - In general, the industry believes the models will be extremely costly
4. How does industry think the USG can best make use of Digital Engineering in future acquisitions?

Examining the Four Questions: Understanding the current state of the industry

1. What is the current ability of the industry to deliver digital models (and/or for simulation) of its items?
2. What is the current ability of the industry to collaborate in a digital environment?
3. Would industry be able to respond to solicitations requiring digital acquisition?
4. **How does industry think the USG can best make use of Digital Engineering in future acquisitions?**
   - Be as specific as possible so each bidder provides products that have the flexibility you need
   - Economics may cause the DoD to only request models that fit a budget rather than the detailed more expensive models that appear to be mandated from DoD
   - Mandate ATML 1671.6 Test Station Descriptions from ATS/ATS vendors that flow to resource and capability libraries, down to ATML 1671.2 instrument descriptions
   - Mandate that all ATML 1671.1 Test Programs come with ATML test descriptions and Standard 1641 libraries (including signals)
   - Additional industry standards including ATML 1671.4 Test configuration, ATML 1671.3 UUT description, ATML 1671.5 test adaptor description and wirelist, and IEEE 1636.1 test results can help support future DE requirements

ATC Projects

Additional Questions / Discussion