

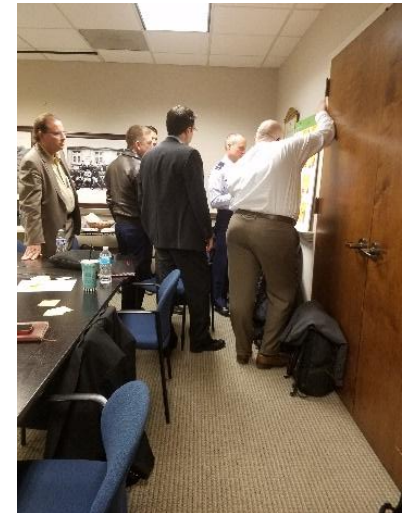


# Workshop Results

## Applying Digital Engineering To Reduce Acquisition Cycle Time



NDIA Rosslyn, VA  
12/13/2016



# Introductory Brief from OTI

  
U.S. AIR FORCE

**Office of Transformational Innovation (OTI)**

- OTI goal is to identify, demonstrate and execute changes within Air Force acquisition *processes* to deliver better capability, faster and cheaper
- "Transformational" Innovation:
  - Causes a fundamental paradigm shift in an activity or organization
  - Requires as much effort to reverse as to enact
  - Engages new stakeholders and/or old stakeholders in a new way
- OTI Office:
  - Improve internal AF acquisition processes
  - Enhance interactions with industry throughout acquisition lifecycle
  - Expand competition among traditional and non-traditional industry partners

Crawl      Walk      Teleport

Visit [www.transform.af.mil](http://www.transform.af.mil)

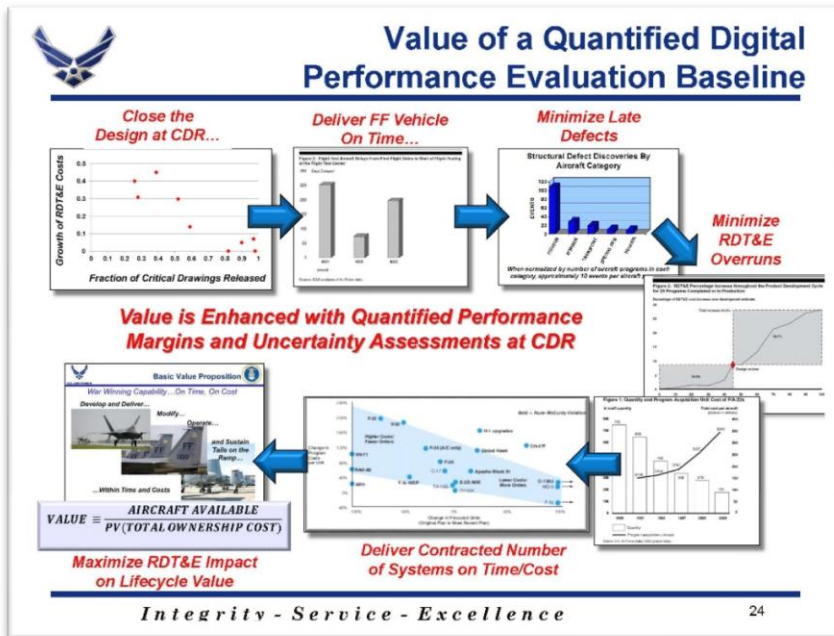
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*Integrity - Service - Excellence*

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- Mr. Jimmie Schuman, SAF/AQ-OTI
- Provided an overview of the Office of Transformational Innovation
- Explained the mission to identify, demonstrate and execute changes within Air Force acquisition processes
- Explained the Digital Thread/Digital Twin joint effort with OTI to reduce wind tunnel testing

# Technical Assessment Brief



- Dr. Edward Kraft, AFTC
- Defined the workshops phases and goals
- Identified the Digital engineering revolution in Aerospace and DoD
- How the T&E community are positioned to provide a quantified assessment of baseline performance in support of key decision points in the acquisition process, most notably the Critical Design Review
- The need for policies and collaboration changes are needed to achieve success

# Defining/ Prioritizing Areas of Interest



- Attendees identified topics that were of concern for the areas of
  - Policy
  - Technology Barriers
  - Processes
- Divided into working groups to prioritize their importance
- Results were out briefed to all attendees.

# Technology Ecosystem/Capabilities

## Ecosystem / Capabilities / Technologies Barriers

- Data Architecture
  - Common data architecture
  - Defined data requirements
  - Defined standards and formats
    - Data structure
  - Data volume
  - Data Sources
- System Architecture
  - System Requirements
  - System Interfaces (esp. external)
  - Mission Need / System Concept
  - Pedigree/Lineage for digital thread
  - Data Security
- Security Architecture
  - Secure sharing
  - Cyber vulnerabilities throughout SLC
  - Data access control
  - Security standards
  - Assurance of data, hardware and software

## Priority Actions

1. Develop D<sup>2</sup> System MNS/Concept
2. Define Critical Functional Requirements
3. Define Major Known Constraints
4. Define Critical Data Requirements

KEY ENABLER: Leverage and influence others continuing work as available and needed

- The Technology Barriers\Ecosystem group was out briefed by Mr. Larry John
- The group defined and prioritized three areas of interest
  1. Data Architecture
  2. Systems Architecture
  3. Security Architecture

# Technology Ecosystem Capabilities

## Data Architecture

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- Areas of concern were
  - Common Data Architecture
  - Defined Data Requirements
  - Defined Standards and formats
    - Data Structures
  - Data Volume
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# Technology Ecosystem Capabilities

## Data Architecture

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- Common Data Architecture
- Defined Data Requirements
  - It is not clear if there are a suitable set of standards and what the core data standards should be. There is also a concern about the volume and velocity of data being recorded and archived.

# Technology Ecosystem Capabilities

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- **Defined Standards and formats**
  - Data Structures
- **Data Volume\ Sources**
  - The diversity of the data sources and what their capabilities are and the architecture concept to push all the data to the proper locations pose barriers that need to be addressed.



# Technology Ecosystem Capabilities

## System Architecture

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- Areas of concern
  - System Requirements
  - System Interfaces(esp. external)
  - System CONOPS
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# Technology Ecosystem Capabilities

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- **System Requirements**
  - It is not clear if there are a suitable set of standards and what the core data standards should be.
  - To further define and identify the requirements and communication links, it is believed that a CONOPS is needed.

# Technology Ecosystem Capabilities

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- System Interfaces(esp. external)
  - The external interfaces will produce challenges that will be related to the requirements, when identified.
  - The more details made available from a mission needs statement or CONOPS will assist in overcoming this barrier.

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- System CONOPS
- Pedigree/Lineage for digital thread
  - The need to understand the requirements via an operational plan or mission needs statement is essential.
  - The data achieved from the plan will improve the confidence barrier for the data and it's use.

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- Data Security
  - Pending requirements determination, protocols will need to cover security concerns from the government and private sector to ensure collaborative use

# Technology Ecosystem Capabilities

## Security Architecture

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- Areas of concern
  - Secure sharing
  - Cyber vulnerabilities throughout SEC
  - Database Control
  - Security Standards
  - Assurance of Data, Hardware and Software

# Technology Ecosystem Capabilities

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# Technology Ecosystem Capabilities

## Security Architecture

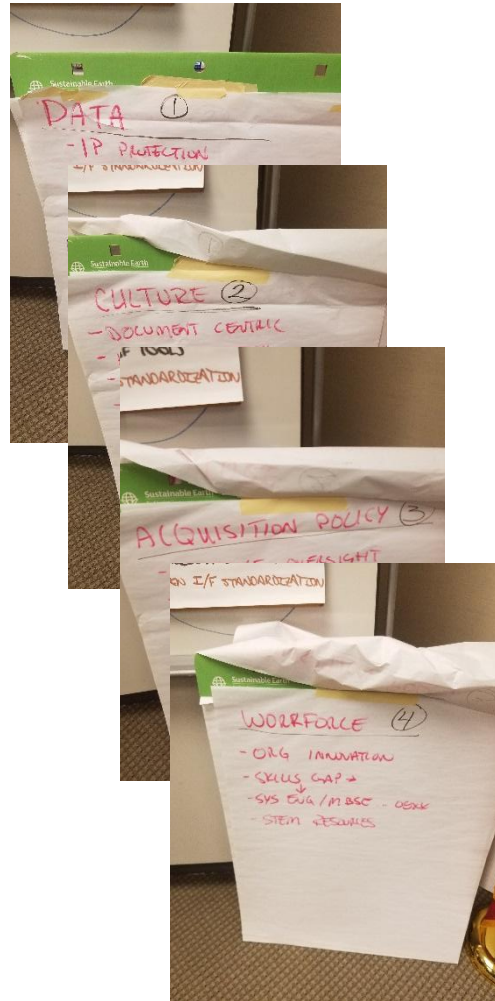
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- Cyber vulnerabilities throughout SEC
- Database Control
- Security Standards
- Assurance of Data, Hardware and Software
  - There is concern focused on the conduit that would facilitate the collaboration capabilities with industry and DoD as the digital models are used and maintained.



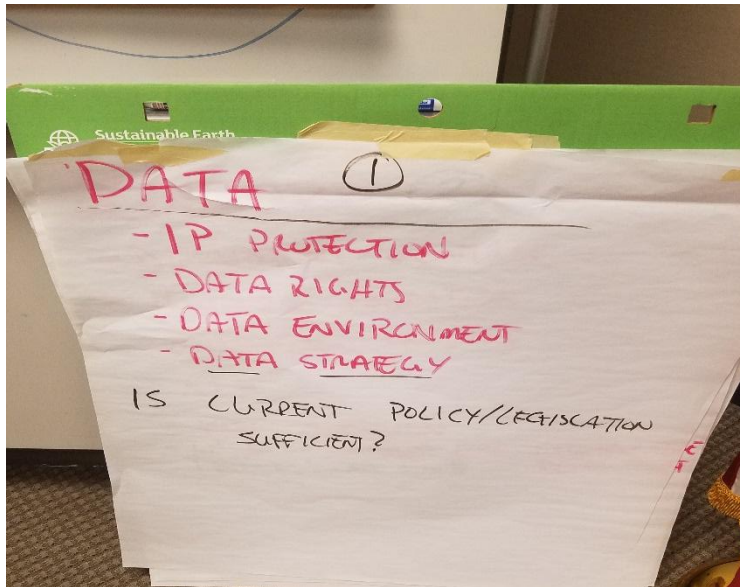
# Policy Out Brief



- The Policy group was out briefed by Col Keith Bearden
- The group defined and prioritized four areas of interest
  1. Data
  2. Culture
  3. Acquisition Policy
  4. Workforce

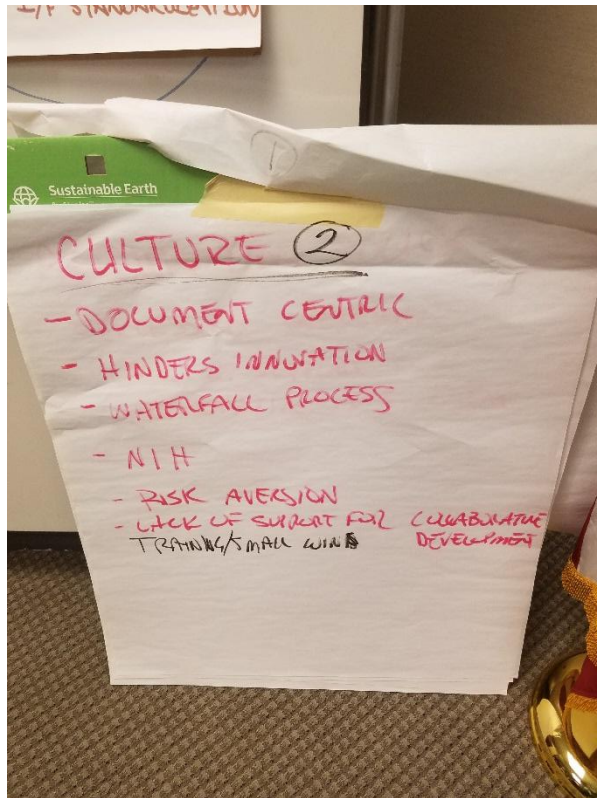
# Policy Out Brief

## Data



- The first priority for the Policy group concerned Data.
- Areas of concern were
  - Intellectual Property Protection
  - Data Rights
  - Data Environments
  - Data Strategy
- Are the current policies adequate to secure the information and are they capable to support a developing Data Strategy?

# Policy Out Brief

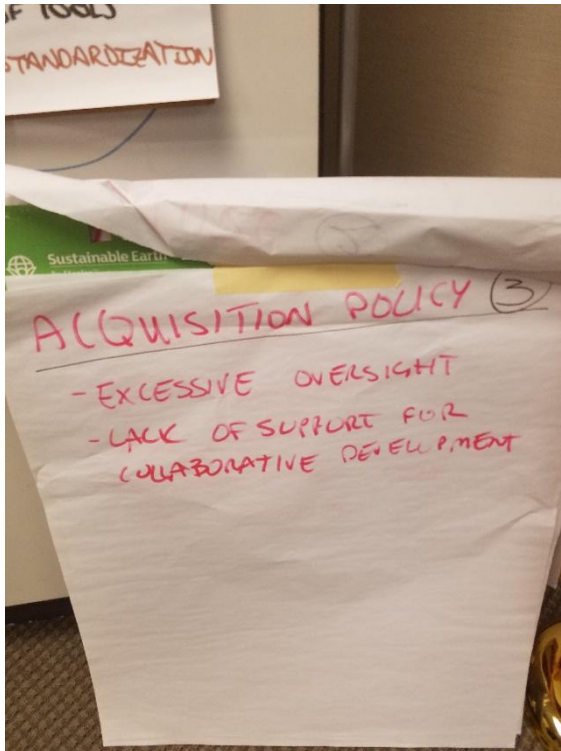


## Culture

- The second area is Culture.
- Areas of concern were
  - A document centric focus
  - Culture hindering innovation
  - The waterfall process
  - “Not Invented Here”
  - Risk aversion
  - Lack of support for Collaboration
- The need to step out of the “ruts” we have created and move to better processes by top down support of new processes and training to endorse change

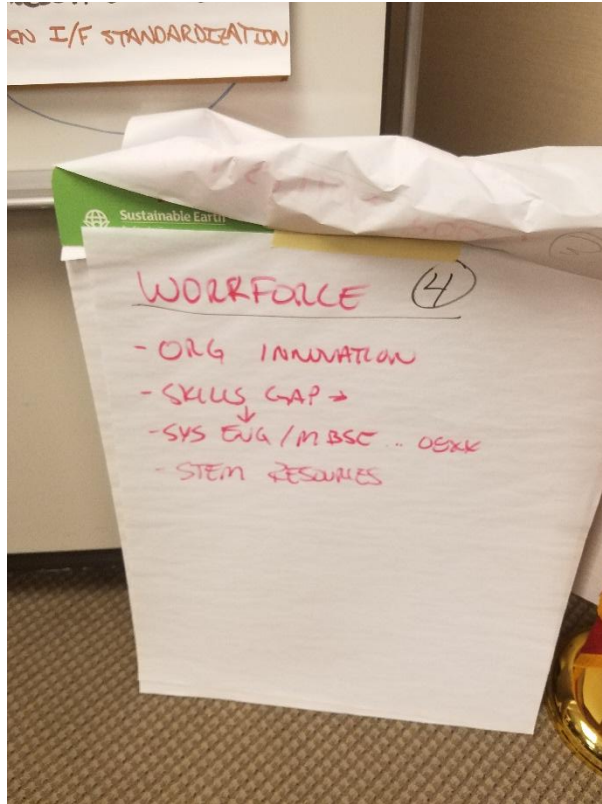
# Policy Out Brief

## Acquisition Policy



- The third area is Acquisition Policy.
- Areas of concern were
  - Excessive oversight
  - Lack of support for collaboration development
- The consensus identified failures in policy to provide oversight where it is not needed and lack of support to collaboration to find better and faster ways through the acquisition process.

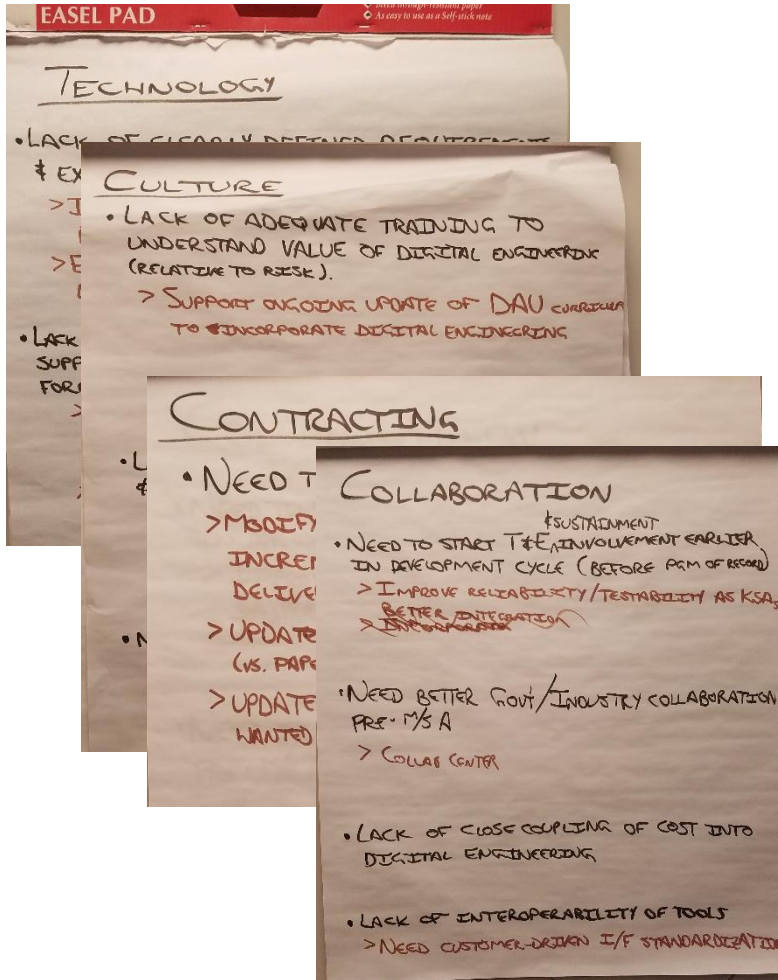
# Policy Out Brief



## Workforce

- The fourth area is Workforce.
- Areas of concern were
  - Organizational Innovation
  - Skills Gap
  - System Engineer Shortage
  - STEM Resources
- There is real concern that the acquisition community is suffering from a lack of skilled personnel and no potential effort for future replacements.

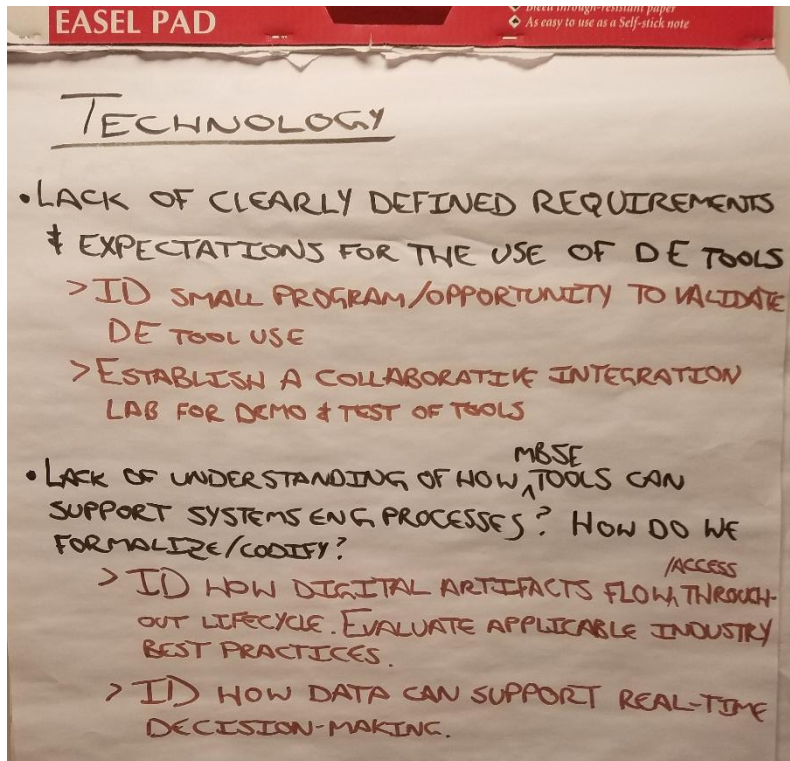
# Processes Out Brief



- The Policy group was out briefed by Scott Parks
- The group defined and prioritized four areas of interest
  1. Technology
  2. Culture
  3. Contracting
  4. Collaboration

# Processes Out Brief

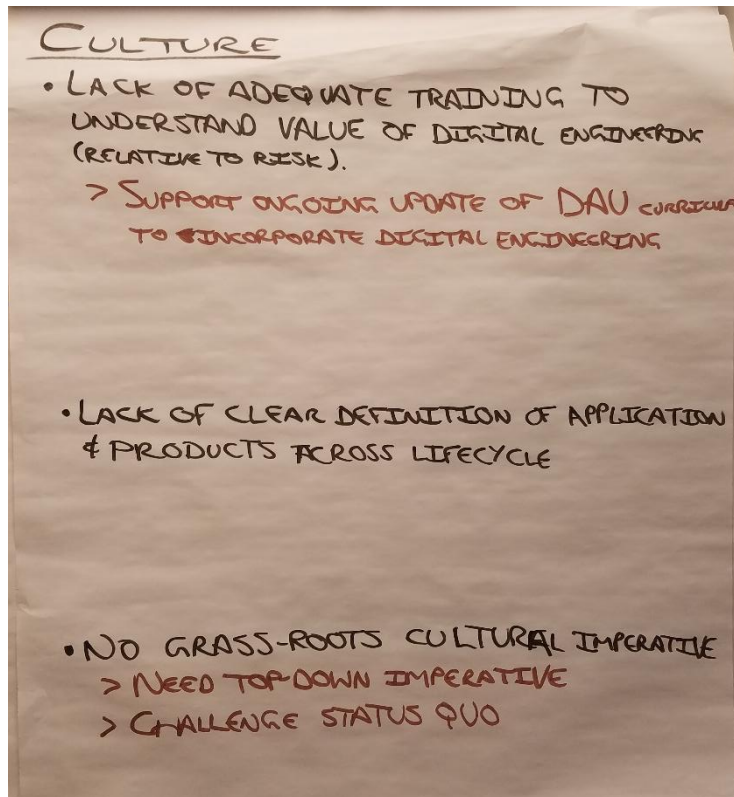
## Technology



- Areas of concern were
  - Lack of clearly defined requirements
  - Lack of understanding of how MBSE tools can support systems Eng. Processes.
- Some proposed options to assist with the technology barriers focused on the selection of small programs to initiate tool testing and the establishment of a collaboration lab to promote searching for the right tools and processes.

# Processes Out Brief

## Culture

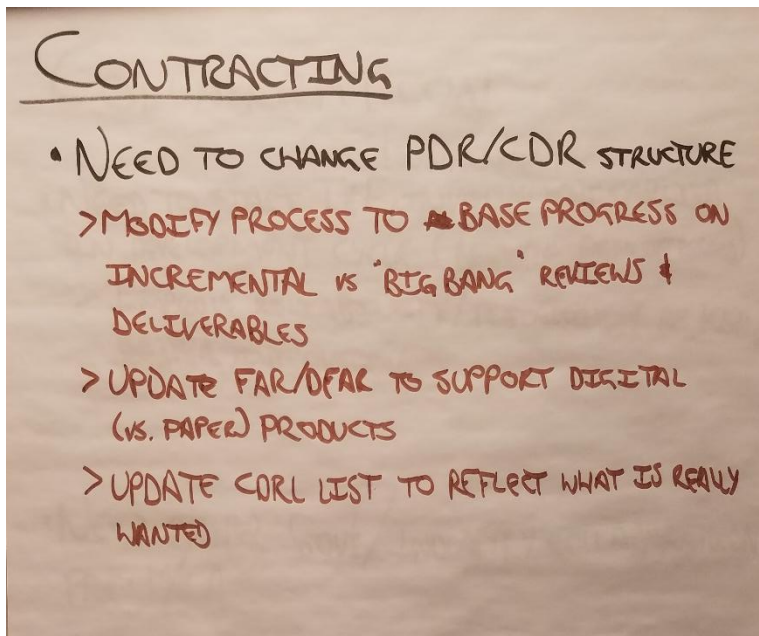


- Areas of concern were
  - Lack of clearly defined requirements
  - Lack of understanding of how MBSE tools can support systems Eng. Processes.
- The cultural space as with other group identified risk aversion as a main barrier and the need to support DAU into the entire DoD space and incorporate digital engineering as part of the curriculum. There is a need for better education and informed personnel.



# Processes Out Brief

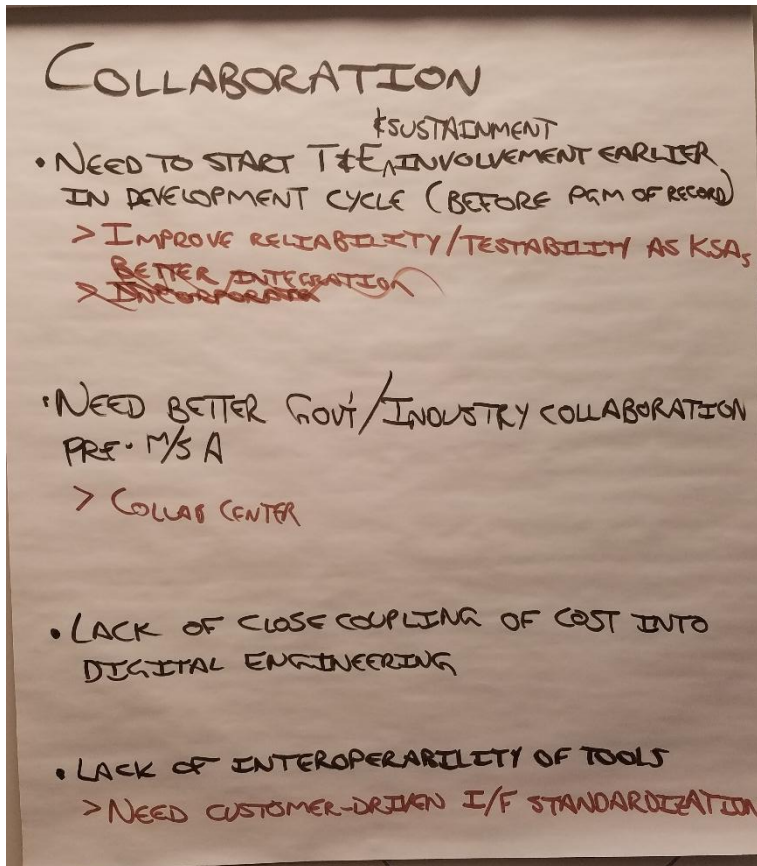
## Contracting



- Areas of concern were
  - Lack of clearly defined requirements
  - Lack of understanding of how MBSE tools can support systems Eng. Processes.
- The area of contracting brought forward the concerns in the Milestone process and improving the focus on progress and not payments. There was also a need to revise the FAR and DFAR to better adapt to the processes available. Also the need for a more detail review of the CDRL lists and assurance that they comply with the program and take a better focus on the significant areas of concern.

# Processes Out Brief

## Collaboration



- Areas of concern were
  - Need to start T&E sustainment involvement earlier
  - Need better Govt/Industry collaboration Pre Milestone A
  - Lack of close coupling of cost into digital engineering
  - Lack of Interoperability tools
- The final areas was collaboration and the need capture data early in the process and automate data flow through the use of collaboration centers. By establishing routine interaction with govt. and industry to achieve desired collaboration. Another factor with collaboration is the lack of interoperable tools. The desire is for the end users to demand definitions for interoperable tools.

# Summary

- Successful meeting achieved
  - Diverse group and good feedback
- Areas of concern brought forward all groups
  - Collaboration
    - Collaboration centers needed
    - Interoperable tools needed
  - Requirements
    - Defining the problem early and clearly
    - CONOPS / mission needs statements with value
  - Culture
    - Better educated and informed personnel
    - Combat risk aversion