ASMT 101 – Fundamentals of Assessment

T2L Support Services LLC

Dr. Larry Solliday, DM
President
lawrence.m.solliday.ctr@mail.mil
larry.solliday@t2linc.com
812-675-7739
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Introduction

Description

The Fundamentals of Assessment course focuses on basic demonstration assessment principles, policies, processes, and practices. This course covers the integrated Assessment process and provides the essential foundation knowledge needed by Assessment professionals and others to participate in Assessment activities more effectively.

Objective

The objective of the ASMT 101, Fundamentals of Assessment, is to emphasize basic demonstration and assessment principles, policies, processes, and practices. ASMT 101 covers the integrated assessment processes and provides the essential foundation knowledge needed by Assessment professionals and others to participate in demonstration and assessment activities more effectively. It is suitable for personnel in other technical acquisition management and program management positions who want to understand more about technology assessment and the critical role it plays in system acquisition.

Course Content

ASMT 101.U01 The Role of Assessment
ASMT 101.U02 Identifying Assessment Requirements
ASMT 101.U03 Assessment Processes
ASMT 101.U04 Technical Demonstration
ASMT 101.U05 Operational Demonstration
ASMT 101.U06 Operational Assessment
ASMT 101.U07 Range of Assessments
ASMT 101.U08 Interoperability
ASMT 101.U09 Data Management
ASMT 101.U10 Assessment Planning
ASMT 101.U11 Assessment Conduct
ASMT 101.U12 Assessment Observation and Analysis
ASMT 101.U13 Assessment Reporting
ASMT 101.U14 Assessment Practical Exercise

Course Schedule

Day One

- 0800 – 0900 The Role of Assessment
- 0900 – 1000 Identifying Assessment Requirements
- 1000 – 1200 Assessment Processes
- 1200 – 1300 Break
- 1300 – 1400 Technology Demonstration
- 1400 – 1500 Operational Demonstration
- 1500 – 1600 Operational Assessment
- 1600 – 1700 Team Building Exercise

Day Two

- 0800 – 1000 Range of Assessments
- 1000 – 1100 Interoperability
- 1100 – 1200 Data Management
- 1200 – 1300 Break
- 1300 – 1500 Assessment Planning
- 1500 – 1700 Assessment Conduct

Day Three

- 0800 – 1000 Assessment Observation and Analysis
- 1000 – 1200 Assessment Reporting
- 1200 – 1300 Break
- 1300 – 1700 Assessment Practical Exercise

Day Four

- 0800 – 1200 Assessment Practical Exercise
- 1200 – 1300 End of Course Wrap Up

ASMT 101.U01

The Role of Assessment

"What we do and why we do it."

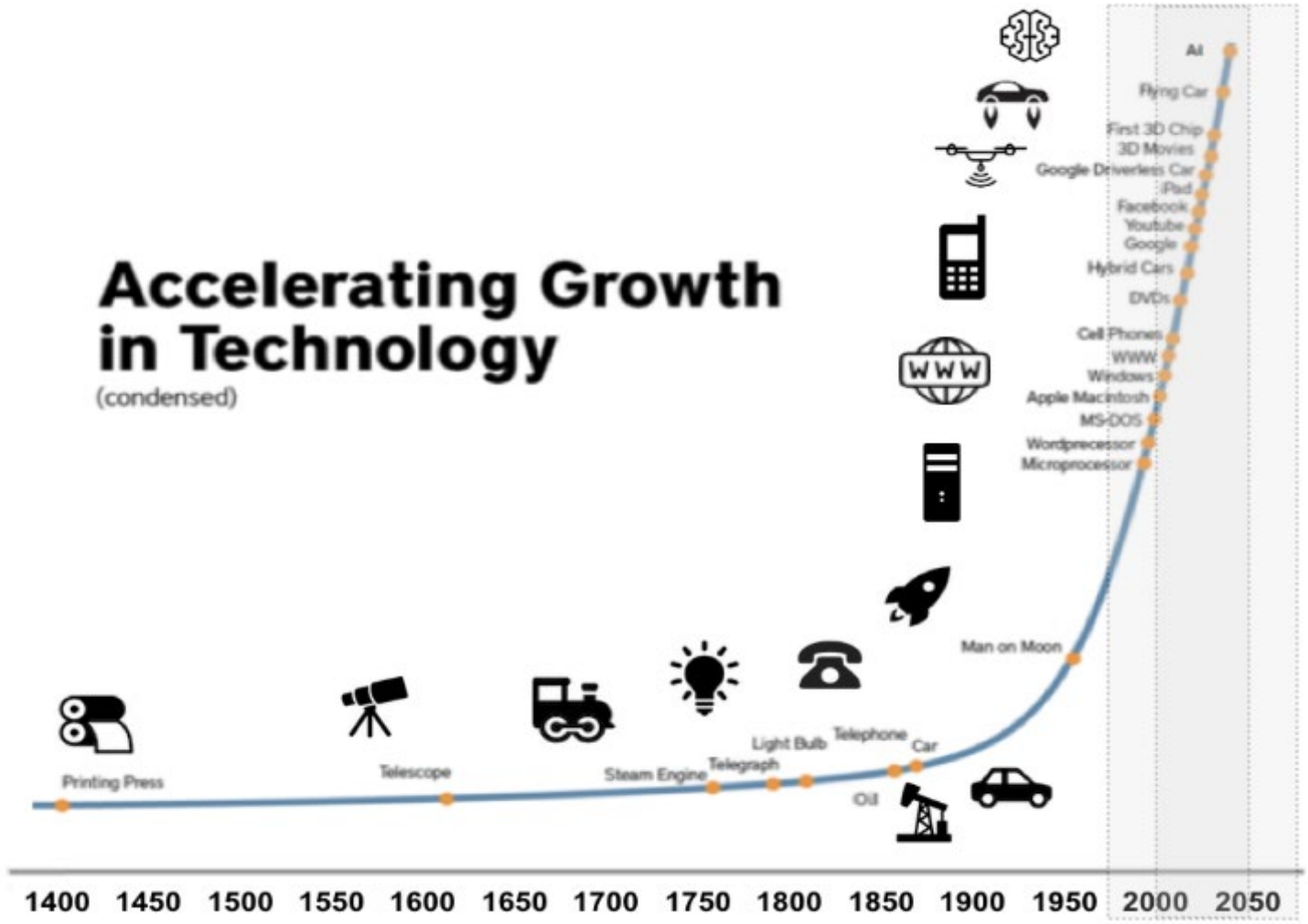
Learning Expectations

- Identify the purpose of Assessment.
- Recognize the differences between Assessment and Test and Evaluation (T&E).
- Recognize the typical Assessment activities utilized throughout each stage of the acquisition process.
- Recognize how Assessment helps to manage program risks, issues, and opportunities.
- Recognize ways and values of combining T&E and Assessment as part of an Integrated Test and Assessment Plan (ITAP).
- Describe typical roles and responsibilities of key Assessment personnel.
- Recognize the ethical responsibilities of Assessment personnel.

Background

- Today's adversaries are changing their tactics, techniques, and procedures at an accelerated pace.
- All Defense requirements cannot be satisfied by the same acquisition processes.
- Urgent requirements must be satisfied today while end-solutions are fielded tomorrow.
- Regardless of region or threat the Combatant Commanders are looking for the 70 to 75 percent solution today.
- Technology is evolving at an accelerated rate (acceleration fuels further acceleration).

Technology Acceleration



Law of Accelerating Returns

- Technology advances on a historical exponential basis versus an intuitive linear basis.
- As technology matures and evolves, those advancements become greater.
- Technological evolution, similar to biological evolution, is an evolutionary process that permits exponential growth to take place.

Note: https://www.businessinsider.com/...2015-5

The Role of Assessment

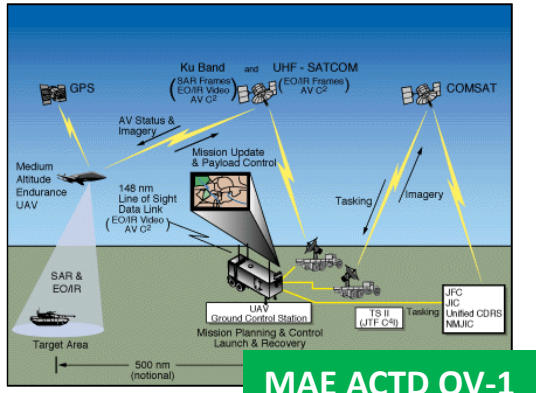
Goal

- Determine the utility of new and innovative emerging and enabling technologies and capabilities in a real-time operation and on a scale large enough to clearly establish operational utility and system effectiveness.

Key Principle

- Maintain a flexible approach to the advanced development process and avoid excessive rigidity and formality in documentation and process.

Demonstration and Assessment



MAE ACTD OV-1

GNAT 750

MQ-9 Reaper

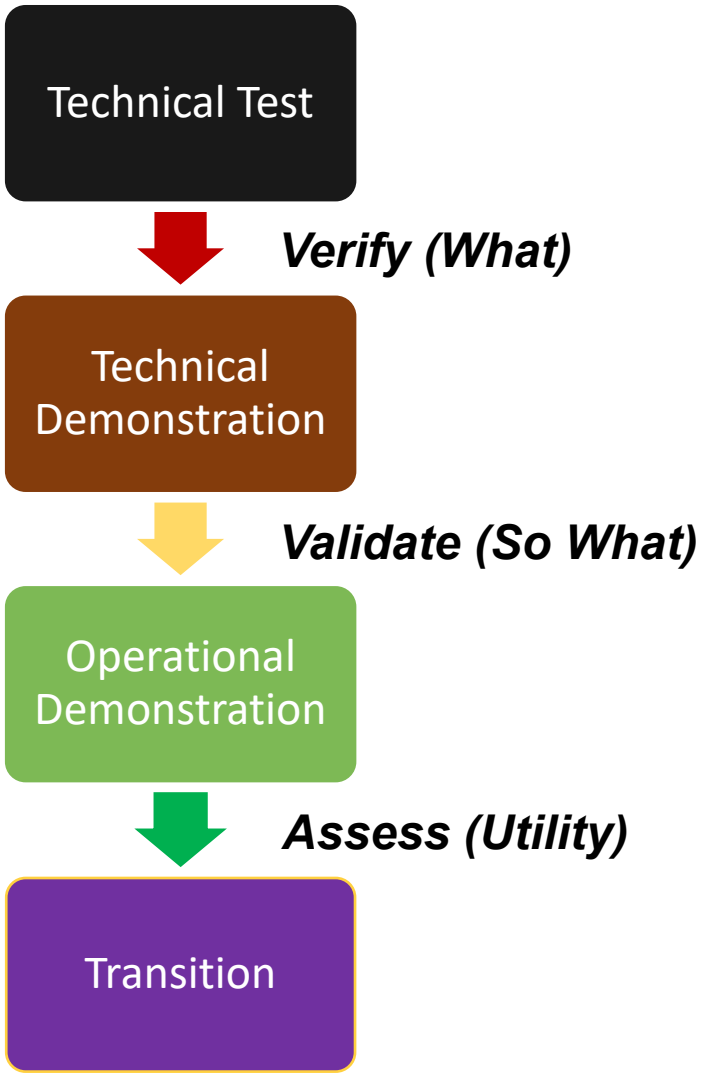
Technology Demonstration

- Systems with potential utility for the user and having relatively mature technology may be evaluated (assessed) by a user in an operational field environment.
- These systems are not subject to the normal acquisition test and evaluation (T&E) process.
- A favorable assessment may result in the decision to acquire additional systems for Service use, bypassing several of the normal acquisition phases.

Technology Assessment

- Purpose: Determine an emerging or enabling technology's operational utility and fully understand its potential and capabilities to address public and/or private market needs.
- Result: Transition emerging or enabling technologies based on public and/or private market needs, and operational requirements and technological needs.

Assessment Methodology



Technical Test -- "What did you build?"

- Verify Requirements and Specifications
- Factory and Lab Environments
- Users Participate as Observers Only

Technical Demonstration -- "Did you build it right?"

- Validate Performance and Effectiveness
- Controlled/Simulated Operational Environments
- Limited User Participation (Test Drive)

Operational Demonstration -- *"Does it support the mission?"*

- Assess Operational Utility (and Capabilities)
- Realistic Operational Environments
- Users Employ and Operate the System(s)

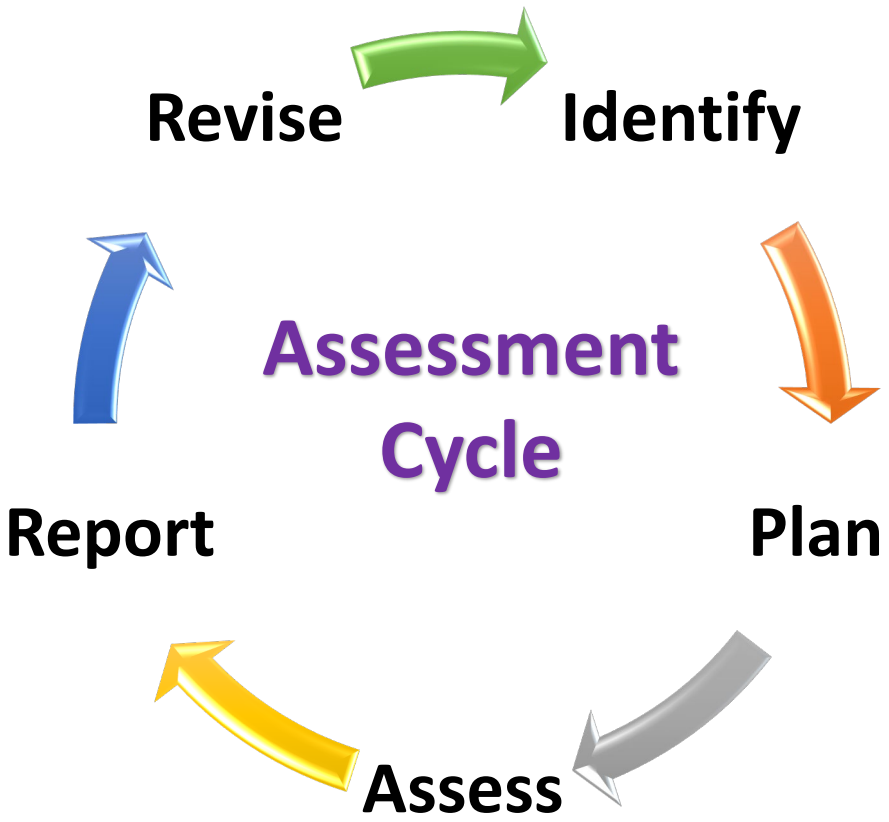
Transition -- *"Can we manage and sustain deployment?"*

- Develop Tactics, Techniques and Procedures (TTPs)
- Management, Operations, Sustainment, Maintenance, etc.
- Extended User Evaluation (Improvement)

Overarching Concepts

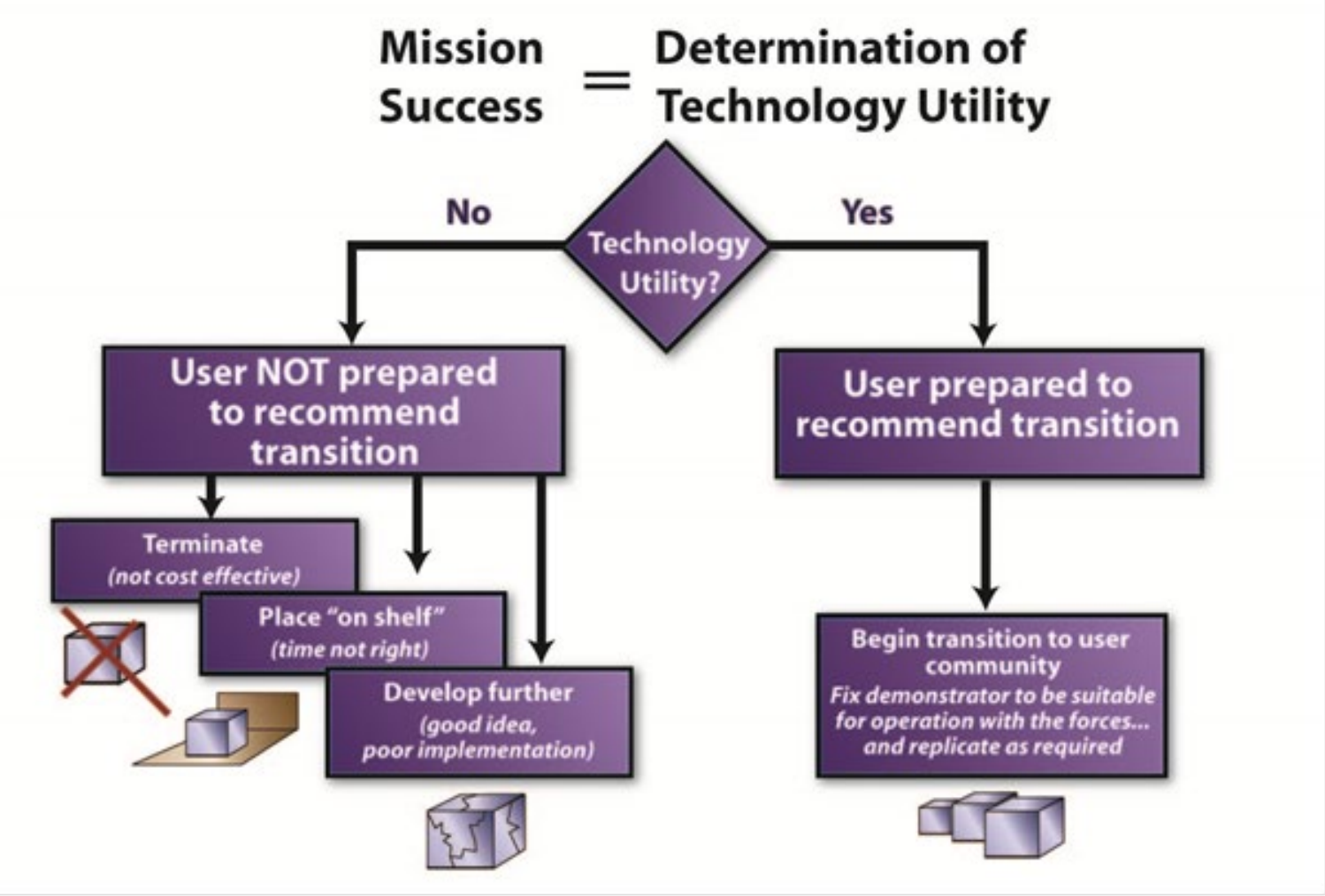
- ✓ Streamlined Processes
- ✓ Scalable
- ✓ Standardized Documentation
- ✓ Flexible
- ✓ Responsive
- ✓ Mobile Infrastructure
- ✓ Reliable
- ✓ Independent Assessment
- ✓ Proven Methodology

Focus Areas



- Provide a system with the highest potential of demonstrating utility.
- Develop employment concepts or procedures for the utility assessment and for use of residual program assets.
- Assess technology utility.
- Identify operational requirements.
- Identify, integrate, and accomplish tasks that will shorten the assessment/transition cycle.
- Identify suitability requirements.

Mission Success



What is Mission Success?

- A clear understanding of a system's utility.
- Even failure of the system or no operational utility could be considered a success.

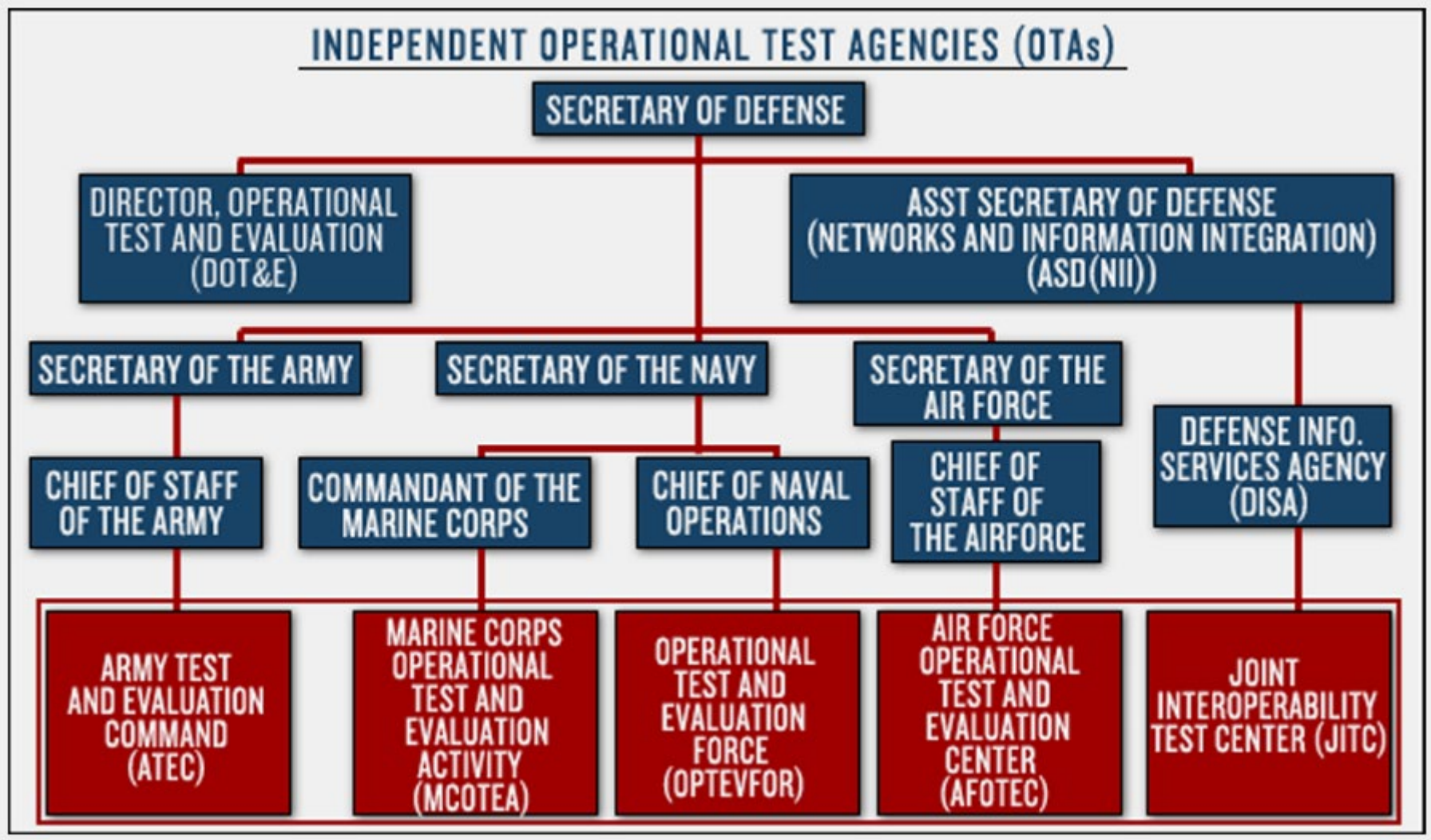
Test versus Assessment

Test and Evaluation

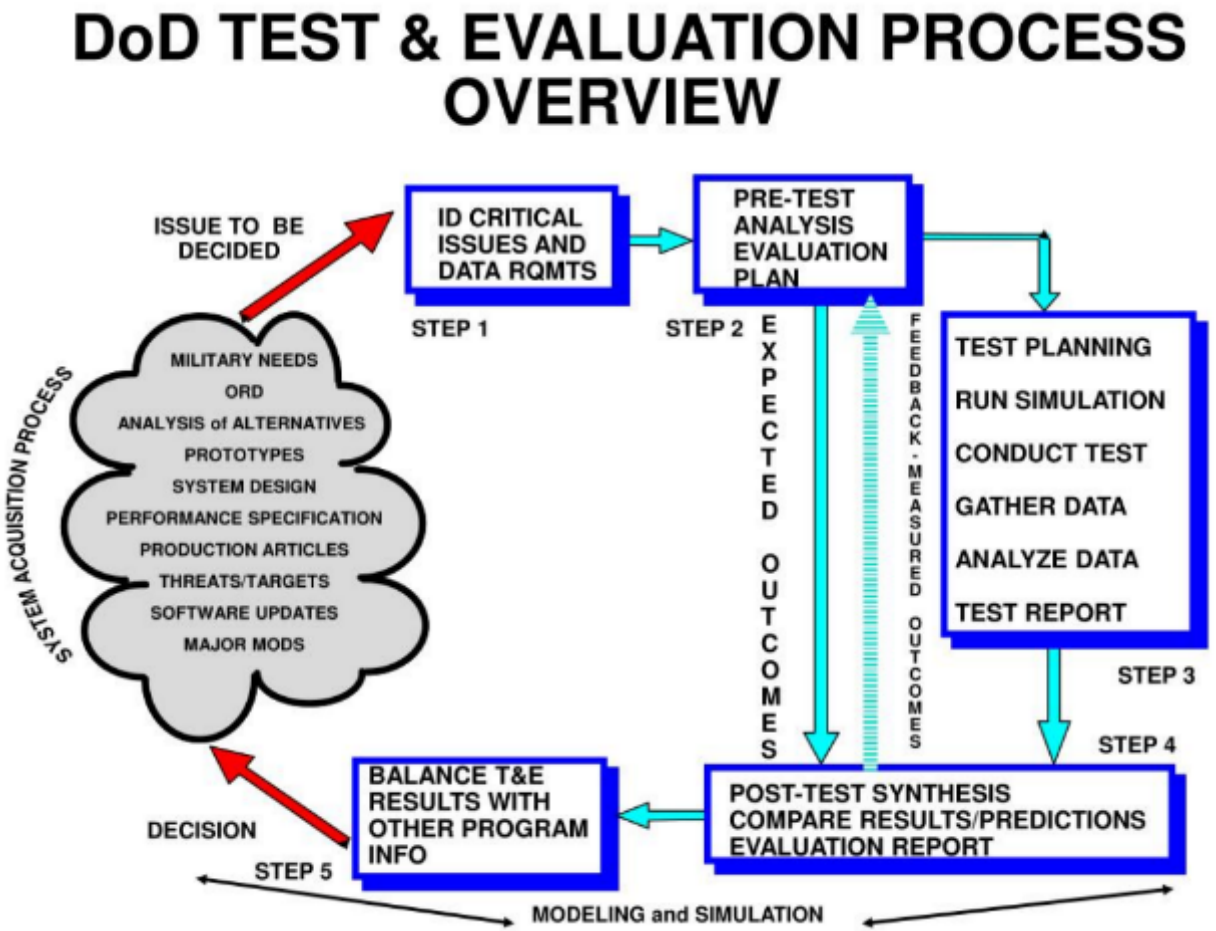
- Test and Evaluation (T&E) is a process by which a system or components are exercised, and results analyzed to provide performance-related information.
- T&E is a method of verification wherein performance is quantitatively measured and analyzed during or after a controlled application of a functional and/or environmental stimulus to determine the degree of compliance.
- The information has many uses including risk identification and risk mitigation and empirical data to validate models and simulations.
- T&E enables an assessment of the attainment of technical performance, specifications, and system maturity to determine whether systems are operationally effective, suitable and survivable for intended use, and/or lethal.
- T&E uses available tools, equipment, procedures, and/or service.
- There are various types of T&E defined in statute or regulation: Developmental Test and Evaluation (DT&E), Operational Test and Evaluation (OT&E), Live Fire Test and Evaluation (LFT&E), and Interoperability Certification.

Note: DAU Glossary, https://www.dau.edu/glossary

Test versus Assessment



Test versus Assessment



Note: https://www.acqnotes.com/. . . /DoDT&EManagementGuide

Five Step T&E Process

- Early feedback on measurability and testability of baseline documents that describe the capability needed, and on test requirements and resources needed.
- Pre-test analysis of the evaluation objectives to determine types and quantities of data required, results expected, and analytic tools needed.
- Test activity and data management (the necessary tests are planned and executed, and data is screened for completeness, accuracy, and validity.
- Post-test synthesis and evaluation (the comparison of measured outcomes with the expected outcomes) tempered with technical and operational judgement.
- Decision Maker(s) weigh the T&E information against other programmatic information to decide a proper course of action.

Test versus Assessment

Demonstration

- Demonstration is a verification method in which qualitative determination of properties is made for an end-item, including software and/or the use of technical data and documentation.
- In this method, the properties being verified are observed, but not measured, while the end-item is being operated or exercised in a dynamic state.
- This verification method requires no instrumentation or special test equipment beyond that inherent to the system, and all data required for verification is obtained by observing operation of the system.

Assessment

- Assessment is a process to examine the utility of a new technology to determine its utility and system integrity by introducing operational concepts utilizing the new technology to solve critical military problems, address identified capability gaps, or meet established capability needs.
- Assessment is an independent assessment of systems, systems-of-systems, and/or families of systems and presents the information required to advance and accelerate the transition of emerging and enabling technologies and capabilities in the most efficient and effective manner possible.
- The primary goal of an assessment program is to determine the utility of a new technology in a real-time operation and on a scale large enough to clearly establish operational utility and systems effectiveness.
- A key principle of an assessment program is to maintain a flexible approach and to avoid excessive rigidity and formality in the documentation and process.

Test versus Assessment

"Testing is a Product"

- Statutory Requirement
- Test
- Evaluate
- Systematic and Objective
- Evaluator and Evaluatee
- Criteria set by the Evaluator
- Requirements and Standards
- Intended and Actual Outcomes
- Measurement is Comparative
- Testing makes Judgements

"Assessment is a Process"

- Customer Driven
- Demonstrate
- Observe
- Methodical and Interactive
- Assessor and Assessee
- Criteria is set by both Parties
- Effectiveness and Performance
- Areas of Improvement
- Measurement is Absolute
- Assessment seeks to Correct Deficiencies

Test versus Assessment

MQ-1B Predator

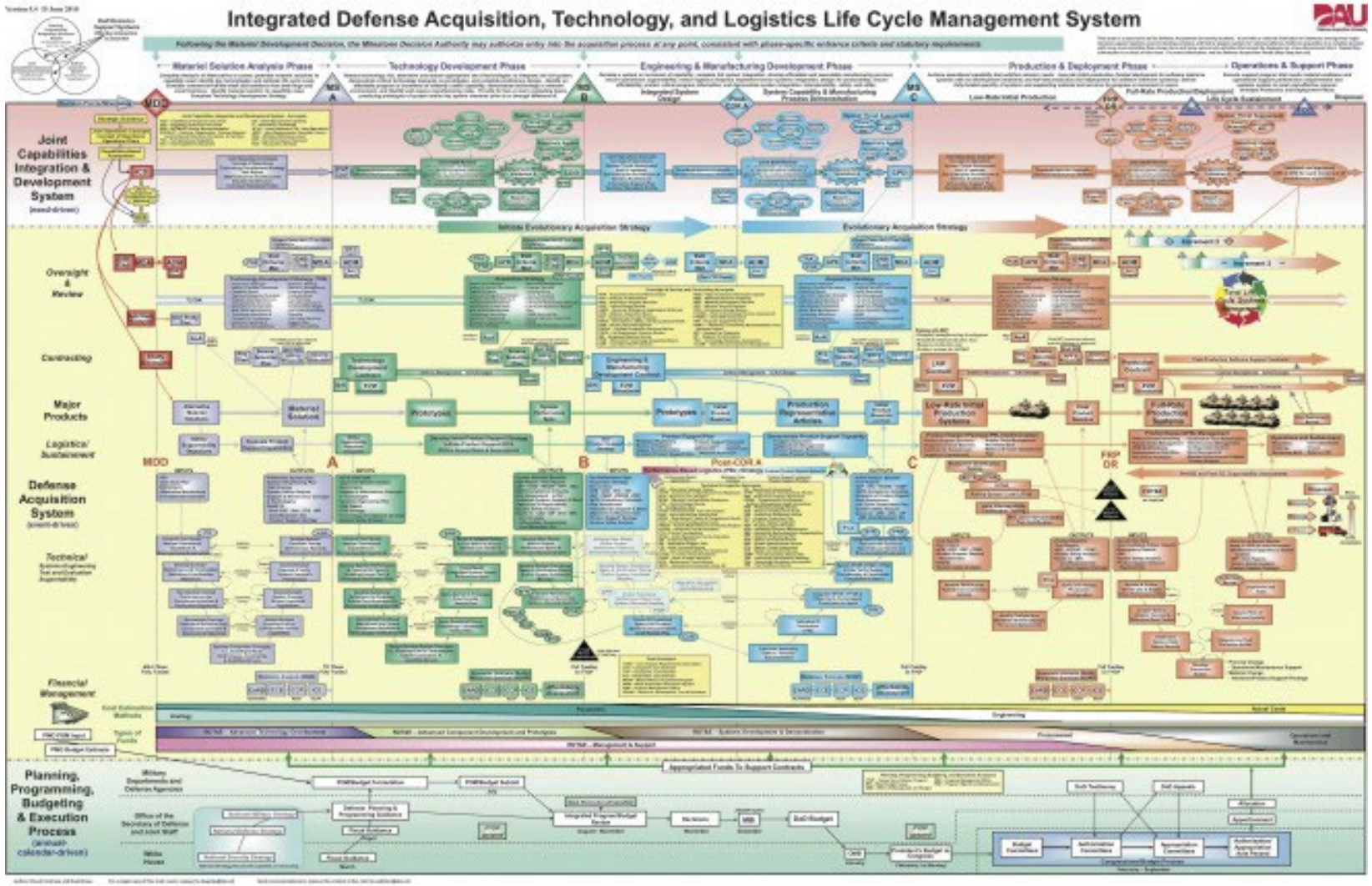
Specification	Requirement	Performance	Test	Assess
Thrust	120 hp	115 hp		
Speed	145 mph	135 mph		
Range	700 nm	675 nm		
Ceiling	26,000 ft	25,000 ft		
Payload	500 lbs	450 lbs		
M Takeoff	2,300 lbs	2,250 lbs		
		OVERALL	**FAILED**	**PASSED**

Assessment Activities in the Acquisition Process

Common focus areas for assessment programs and activities in the acquisition process include, but are not limited to:

- Provide a system with the highest potential of demonstrating utility.
- Develop employment concepts or procedures for the utility assessment and for use of residual program assets.
- Assess technology utility.
- Identify operational requirements.
- Identify, integrate, and accomplish tasks that will shorten the assessment/transition cycle.
- Identify suitability requirements.

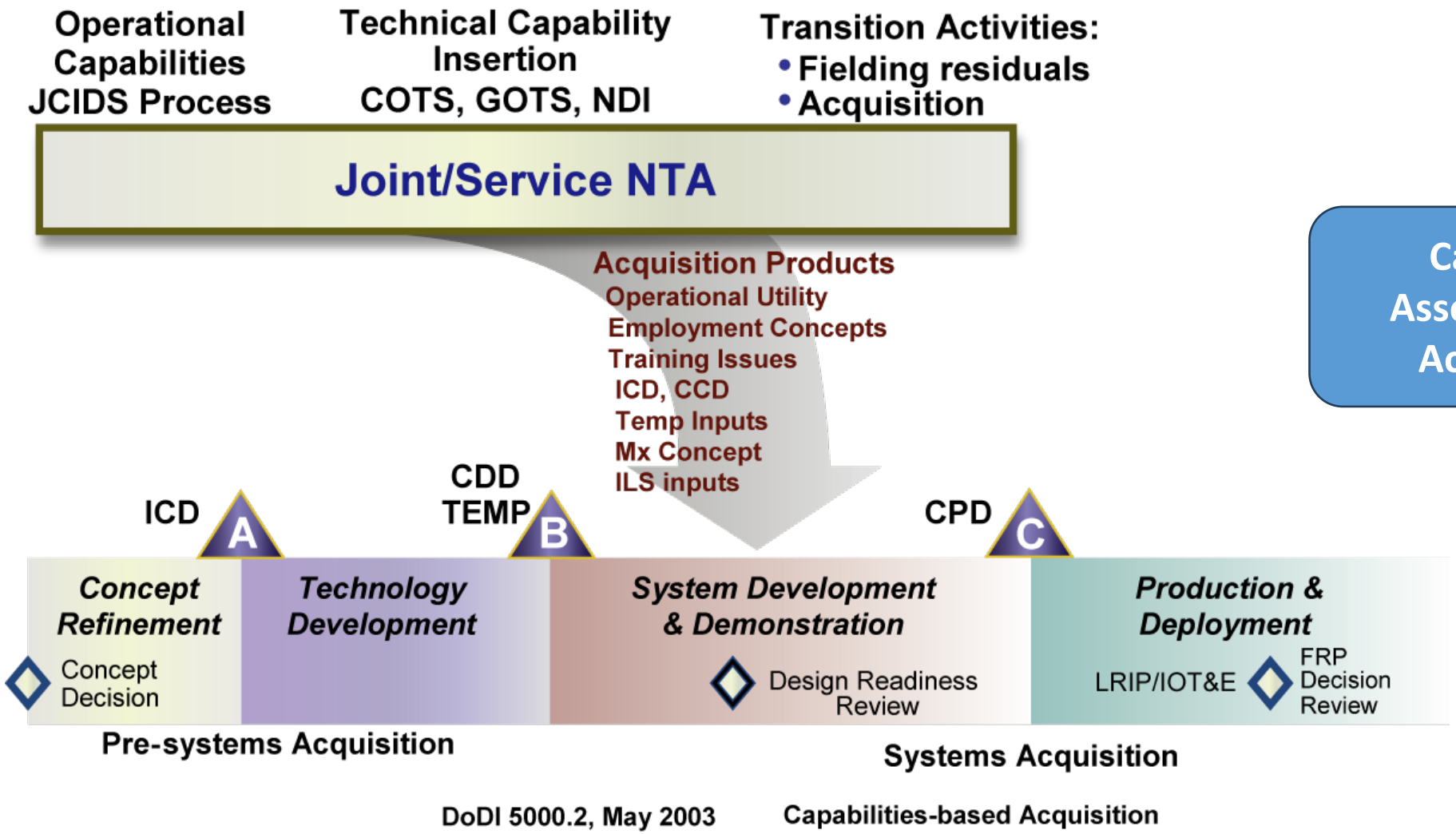
Integrated Defense AT&L Life Cycle Management System



Life Cycle Management

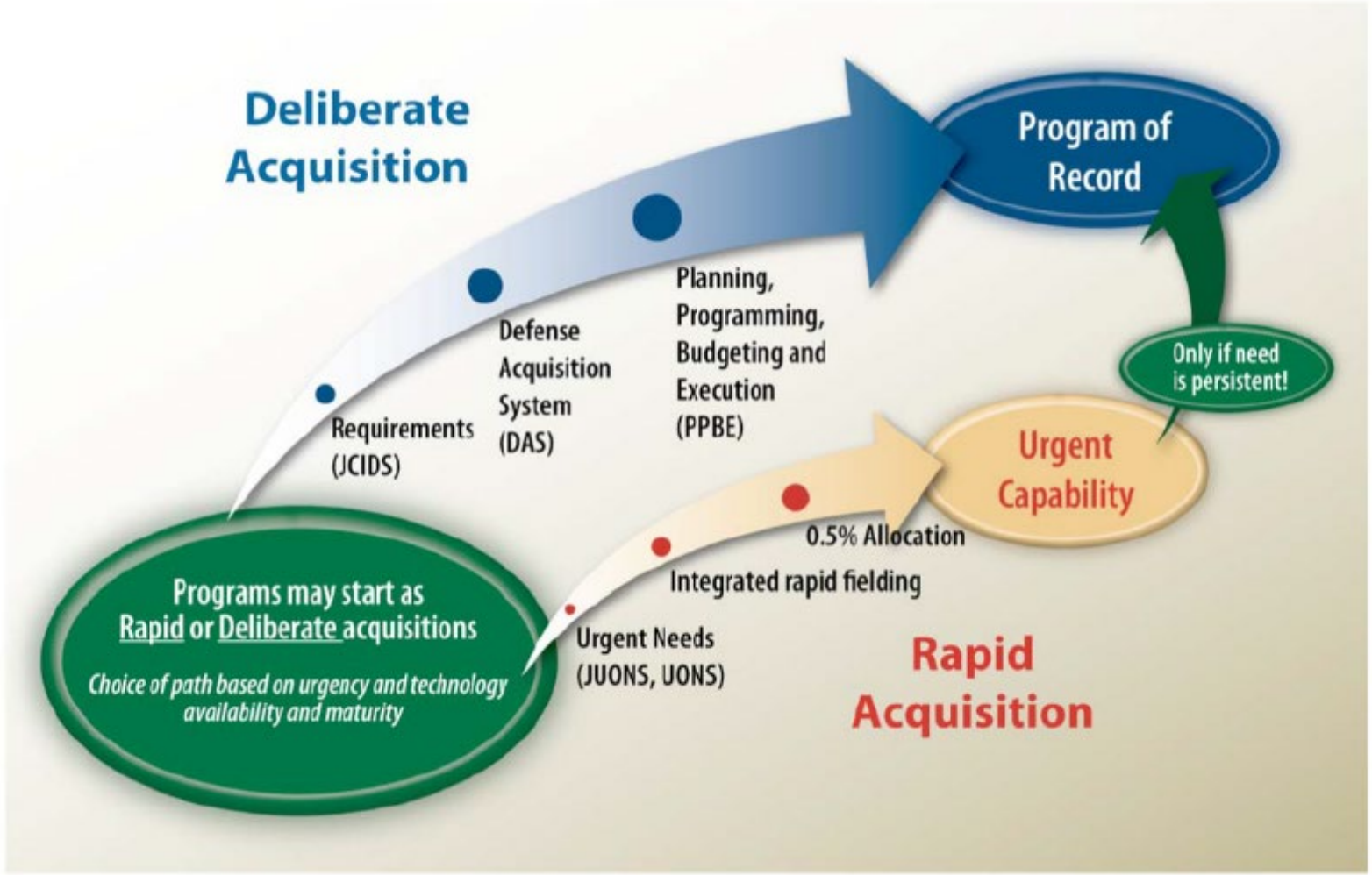
- Deliberate Acquisition
- Test and Evaluation (DT&E, OT&E, JT&E).
- Statutory Requirement
- Effectiveness and Suitability
- Immature Technology
- Major Defense Acquisition Programs (MDAP)/ACAT I or II
- Program of Record

Integrated Assessment Process



Capability Assessment to Acquisition

Rapid Acquisition

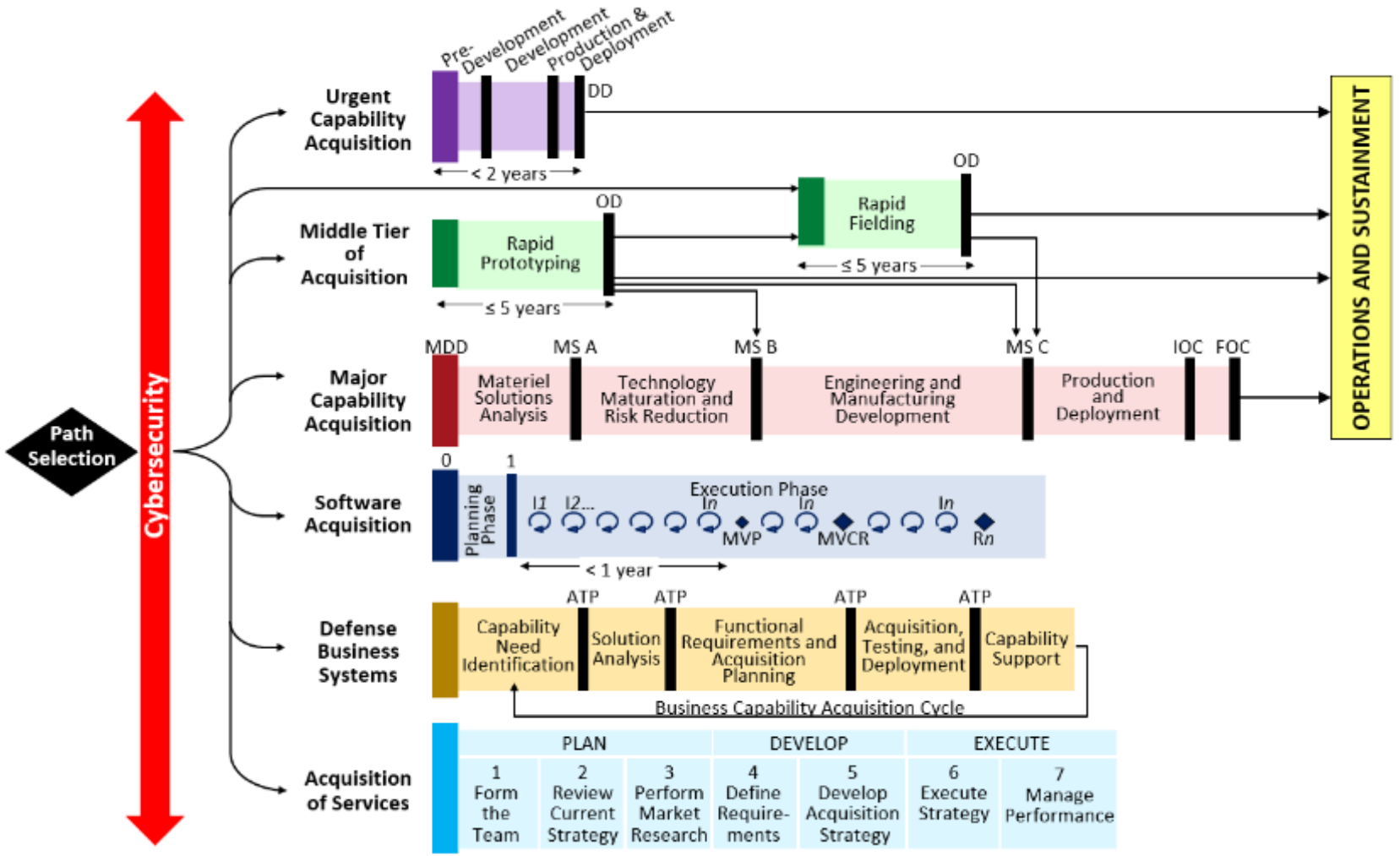


What is Rapid Acquisition?

- Demonstration and Assessment
- Service or Component Discretion
- Operational Utility (Capabilities Based)
- Mature or Maturing Technology
- Generally Non-MDAP Programs/ACAT III or less

Note: Fulfillment of Urgent Operational Needs

Adaptive Acquisition Framework



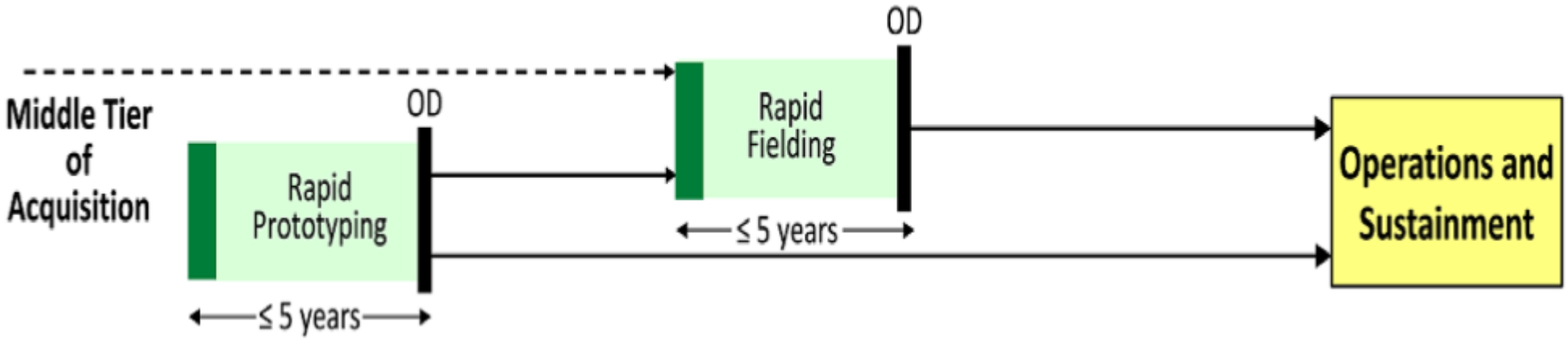
Tenets of the Defense Acquisition System

1. Simplify Acquisition Policy
2. Tailor Acquisition Approaches
3. Empower Program Managers
4. Data Driven Analytics
5. Active Risk Management
6. Emphasize Sustainment

Effective: July 2019

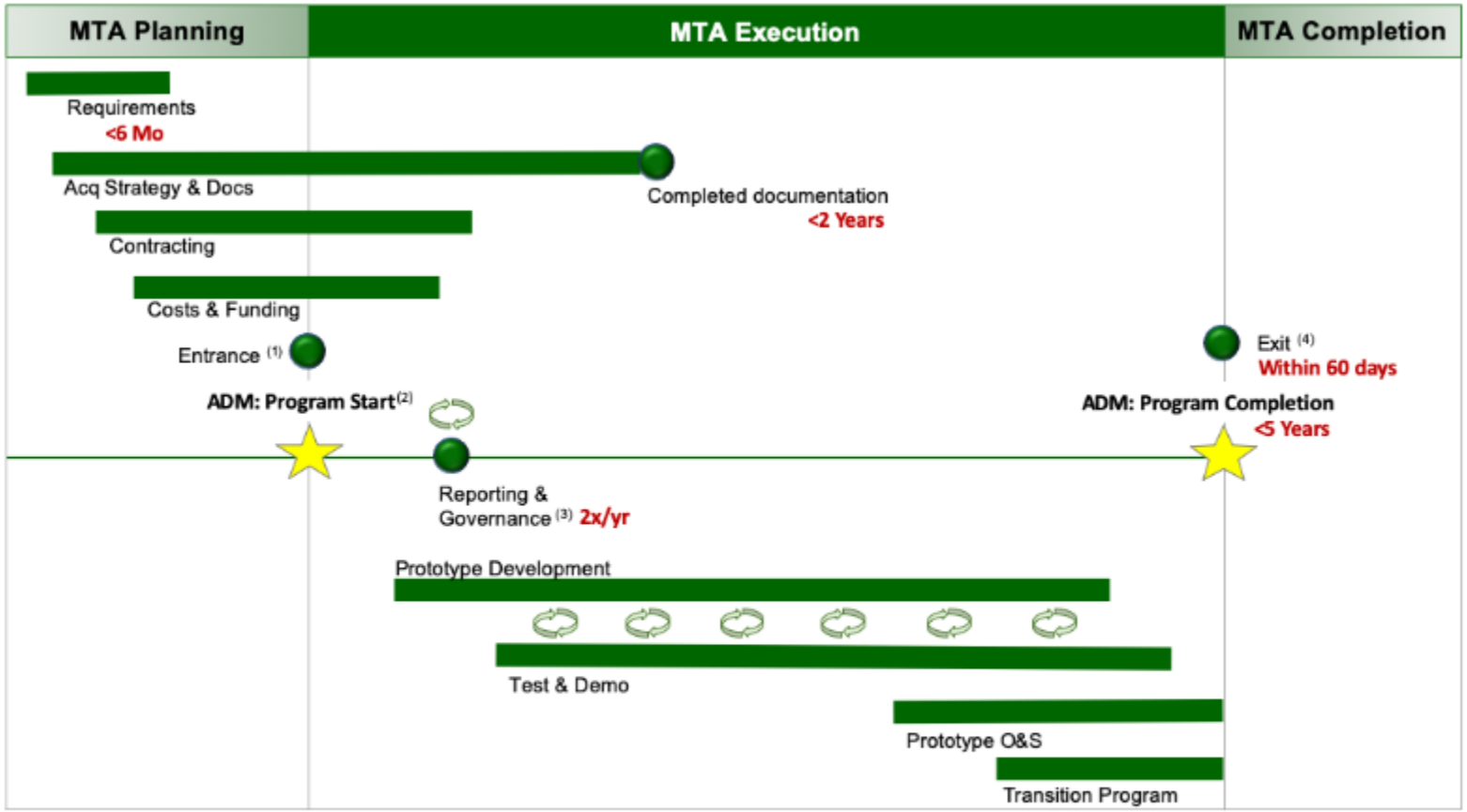
Note: AAF, https://www.aaf.dau.edu

Middle Tier of Acquisition – Rapid Prototyping



- The Middle Tier of Acquisition (MTA) pathway is used to rapidly develop fieldable prototypes within an acquisition program to demonstrate new capabilities and/or rapidly field production quantities of systems with proven technologies that require minimal development.
- The MTA pathway is intended to fill a gap in the Defense Acquisition System (DAS) for those capabilities that have a level of maturity to allow them to be rapidly prototyped within an acquisition program or fielded, within 5 years of MTA program start.
- The MTA pathway may be used to accelerate capability maturation before transitioning to another acquisition pathway or may be used to minimally develop a capability before rapidly fielding.

Middle Tier of Acquisition – Rapid Prototyping



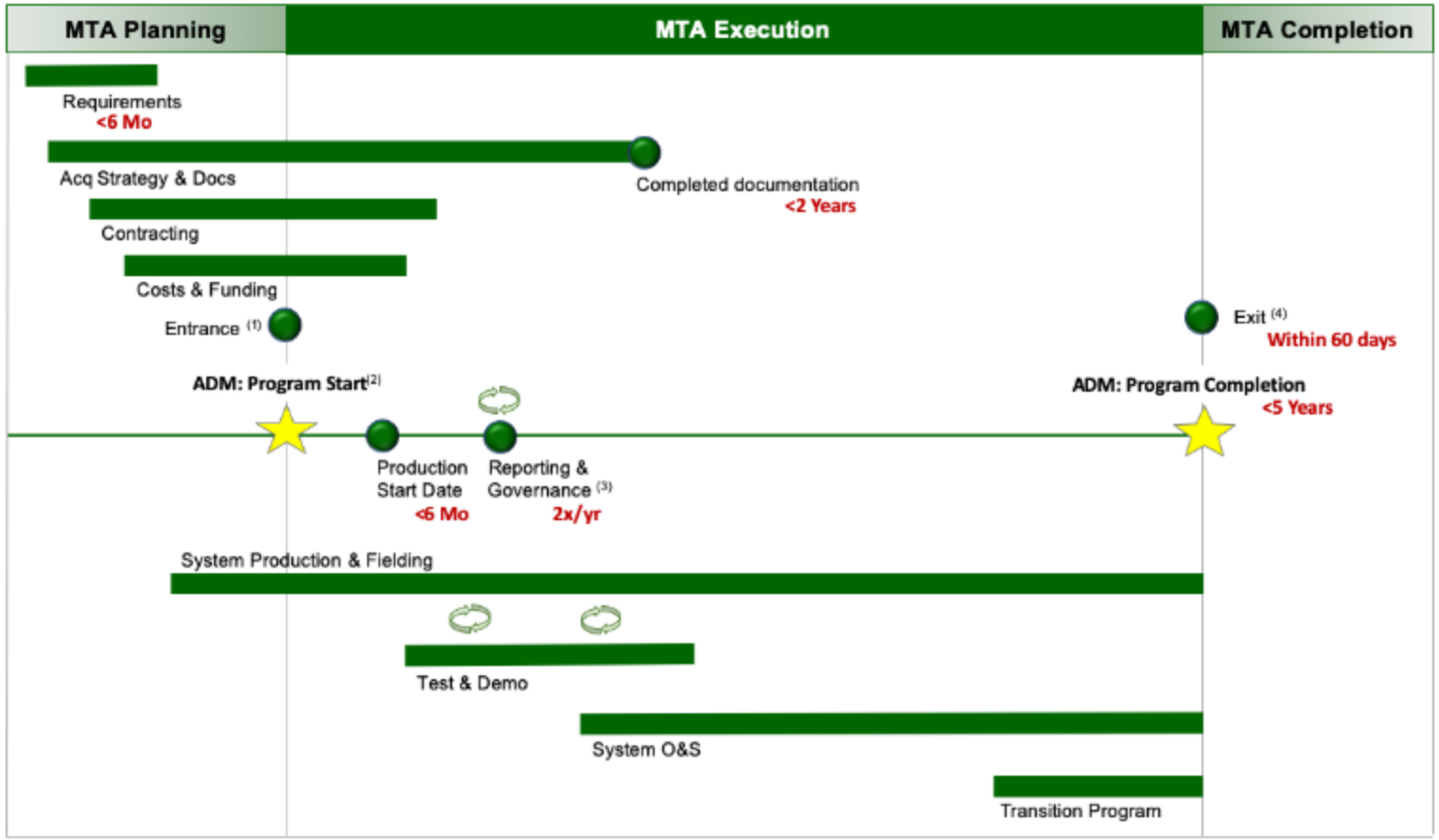
(1) *Major Systems*: Acquisition Decision Memorandum(ADM) signed by the Decision Authority (DA), Acquisition Strategy (which includes [1] Security, Schedule & Production Risks; [2] Test Strategy/Results; and [3] Transition Plan), and Program Identification Data (PID)
Non-Major Systems: ADM signed by the DA, PID
(2) Major Defense Acquisition Programs (MDAPs) require Under Secretary of Defense for Acquisition & Sustainment (USD(A&S)) Prior Written Approval
(3) Updated PID submitted twice a year with President's Budget and Program Objective Memorandum submissions to Office of Secretary of Defense (OSD)
(4) Signed Outcome ADM, Final PID, Assessment of Test Results

Rapid Prototyping Path

- Provides for the use of innovative technologies to rapidly develop fieldable prototypes to demonstrate new capabilities and meeting emerging military needs.
- Objective is to field a prototype meeting defined requirements that can be demonstrated in an operational environment and provide for a residual operational capability within five (5) years of the program start.
- Cannot exceed five (5) years to complete without a Defense Acquisition Executive (DAE) waiver.

Note: AAF, https://www.aaf.dau.edu

Middle Tier of Acquisition – Rapid Fielding



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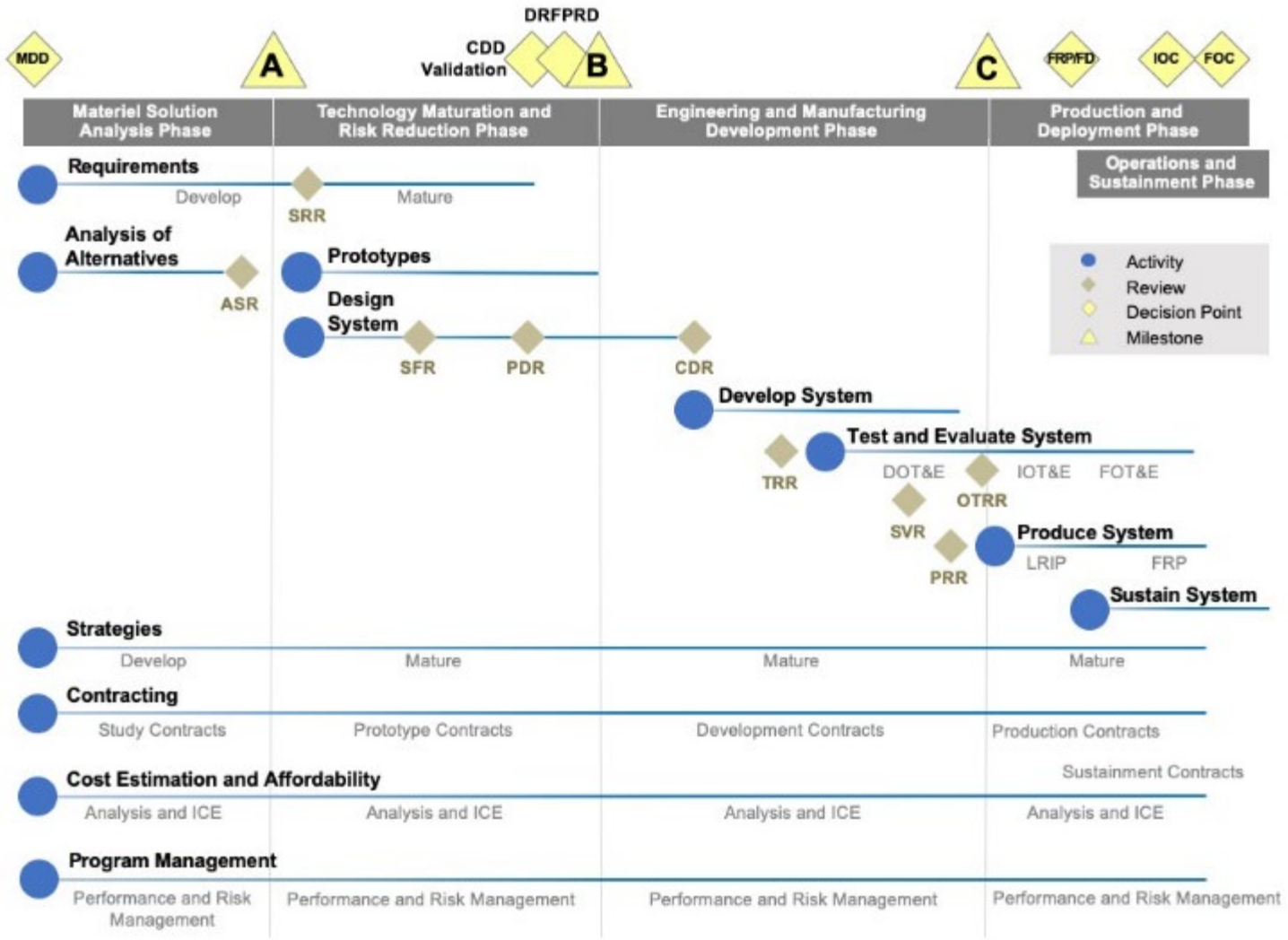
Rapid Fielding Path

- Provides for the use of proven technologies to field production quantities of new or upgraded systems with minimal development required.
- Objective is to begin production within six (6) months and complete fielding within five (5) years of the MTA program start date.
- Program production start cannot exceed six (6) without a Defense Acquisition Executive (DAE) waiver.
- Cannot exceed five (5) years to complete without a DAE waiver.

Note: AAF, https://www.aaf.dau.edu

Major Capability Acquisition

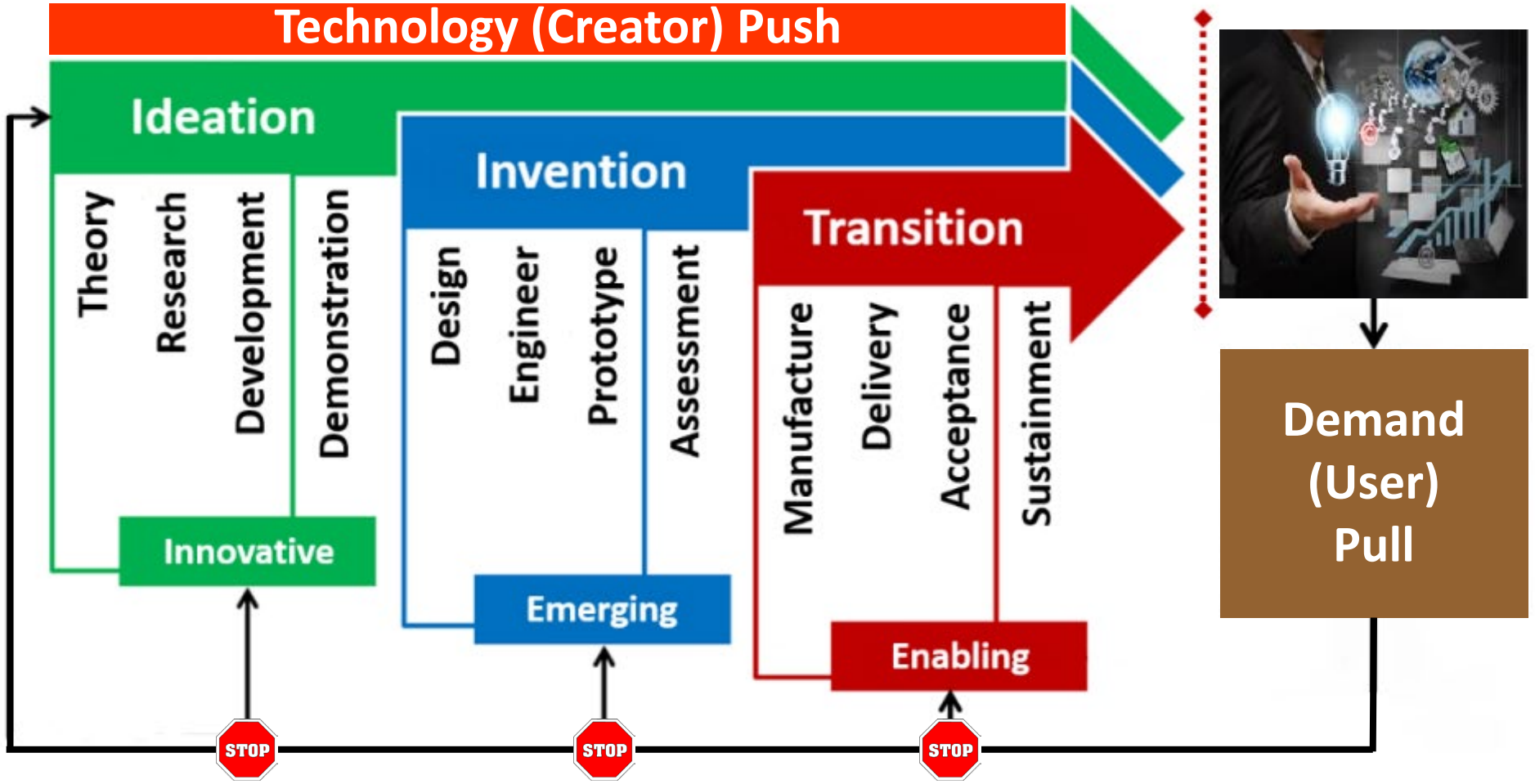


Major Capability Acquisition

- Acquire and modernize military unique programs that provide enduring capability.
- Typically follow a structured analyze, design, develop, integrate, test, evaluate, produce, and support approach.
- Designed to support major defense acquisition programs, major systems, and other complex acquisitions.
- Acquisition and product support processes, reviews, and documentation will be tailored based on the program size, complexity, risk, urgency, and other factors.

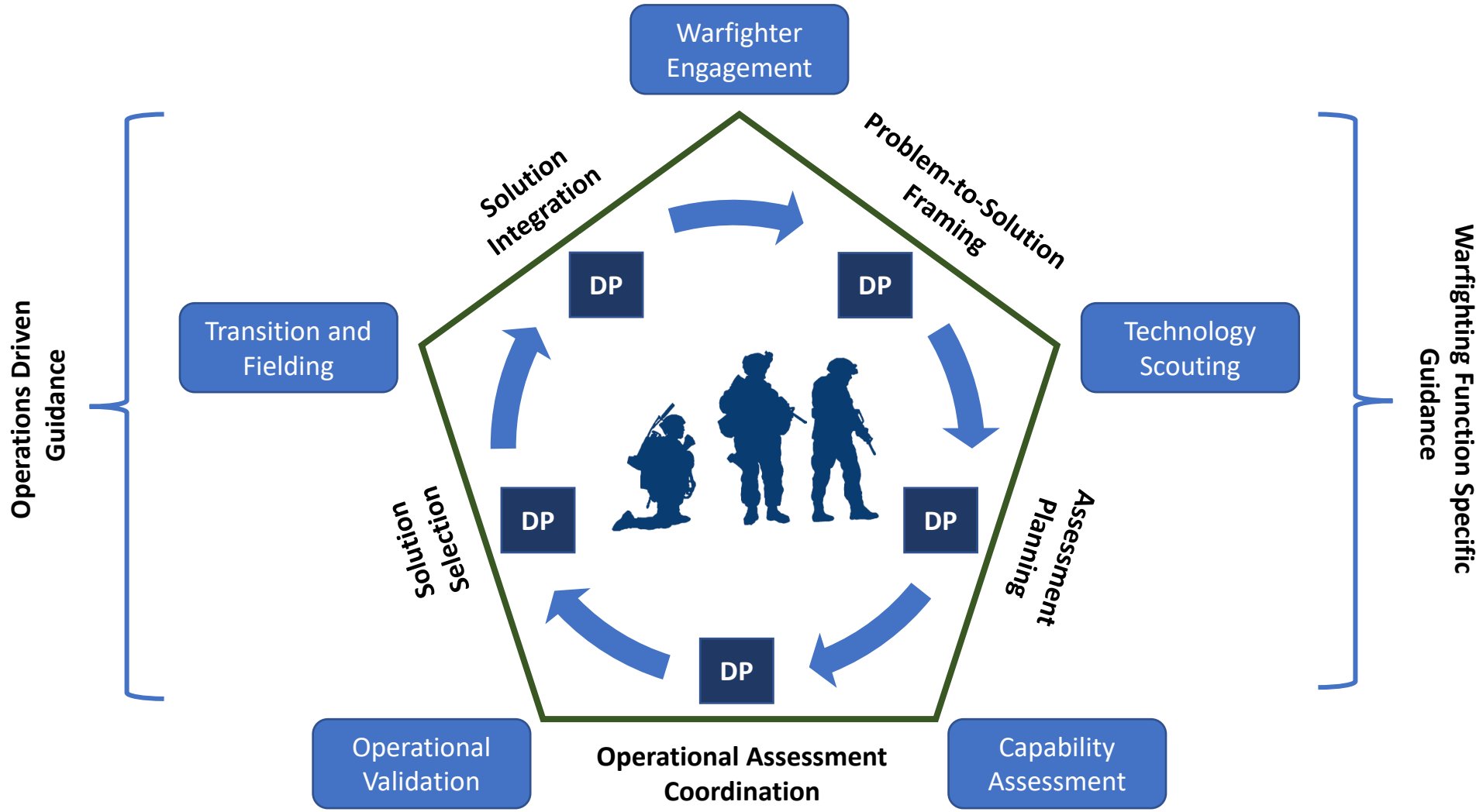
Note: AAF, https://www.aaf.dau.edu

Innovation Continuum

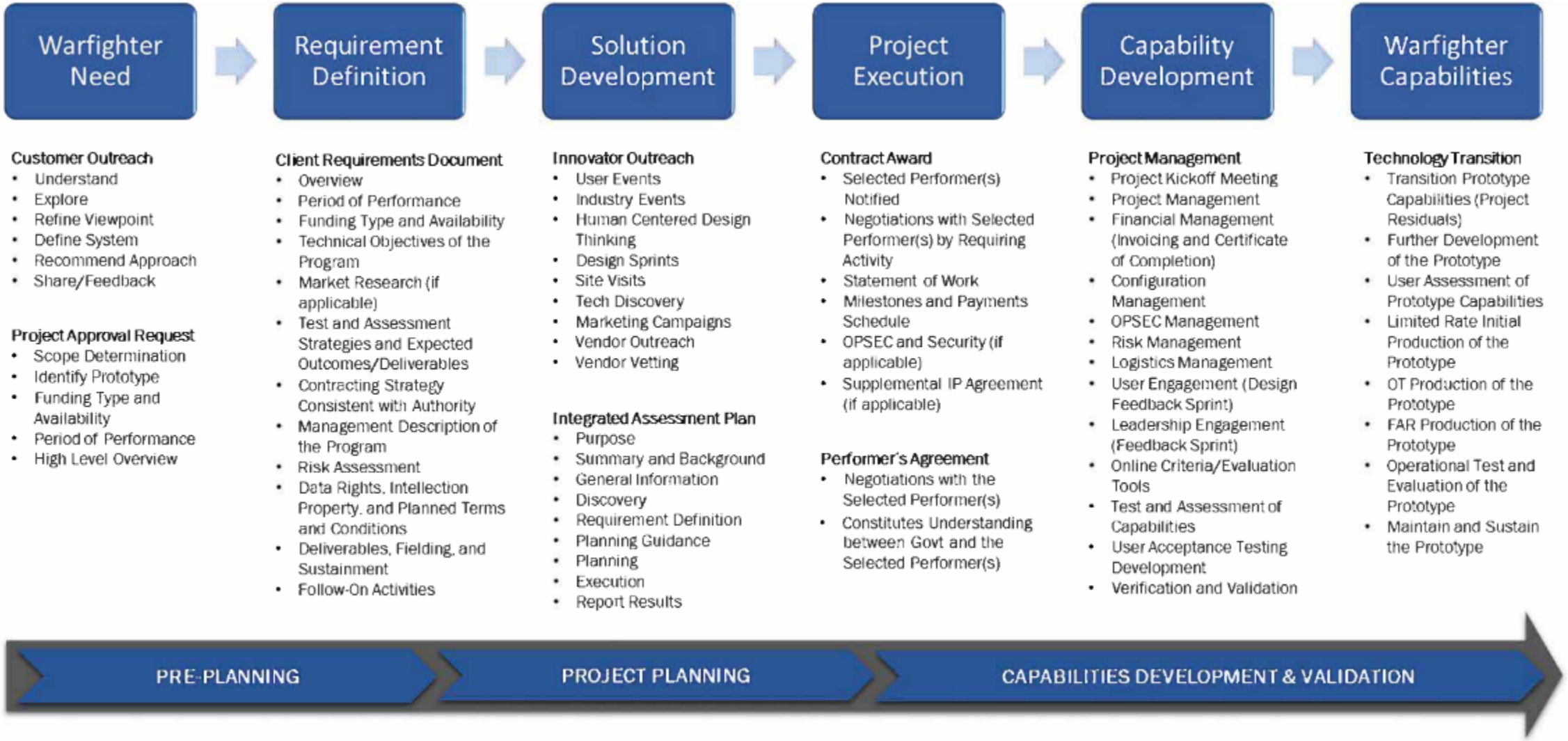


Identify, Demonstrate, Assess, Transition, and Sustain Innovative Concepts and Technologies

Innovation Cycle



Prototype Process



Risks, Issues, and Opportunities

Risks

- Something unplanned that might happen that could have a negative impact on your assessment.

Issues

- Something that is currently happening and is having a negative impact on your assessment.

Opportunities

- Something unplanned that might happen that you could exploit to have a positive impact on your assessment.

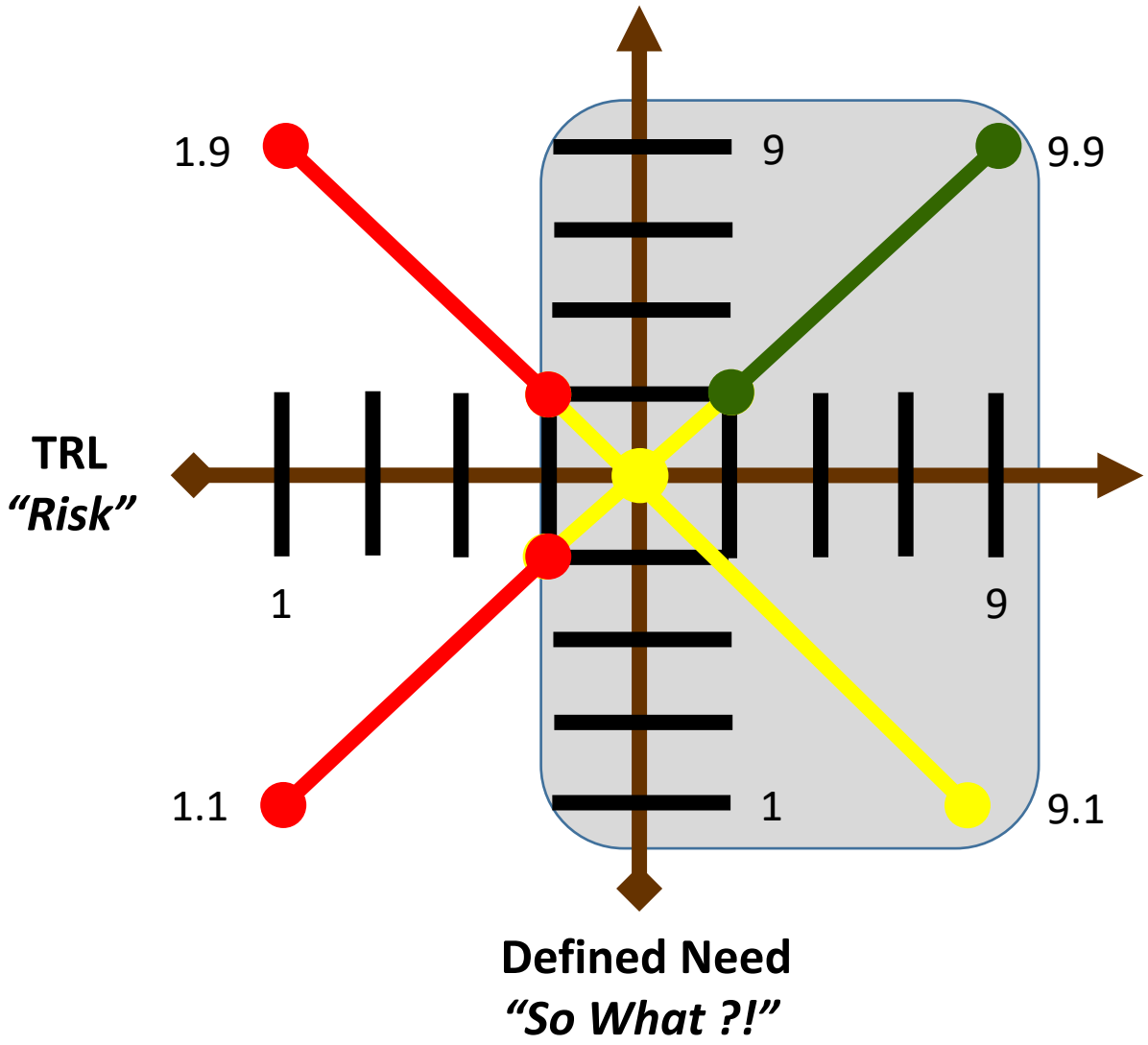
Risk Management

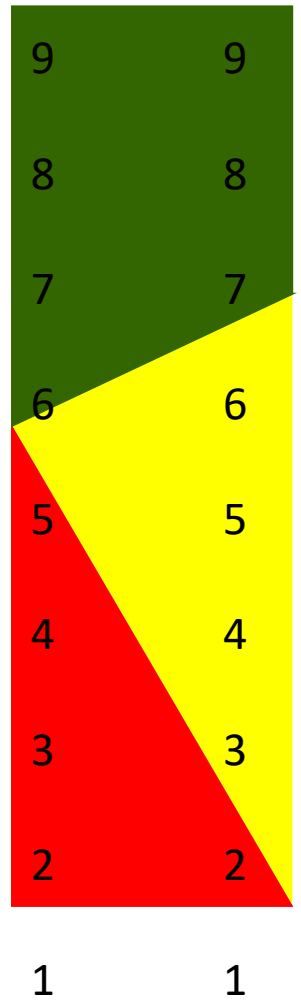
Technology Maturity Considerations

- If technology maturity or requirements stability risks exist, the Assessments Team should structure an assessment event to assess the technology early in the program life cycle, during the development pathway, to conduct technology assessment and risk reduction.
- If technologies are mature, the integration of components has been demonstrated, and the requirements are stable and achievable, the Assessments Team can consider assessing the technology at system development with acceptable risk.

Note: Risk Management Overview, https://www.dau.edu/. . . /Risk-Management.aspx

Risk Management

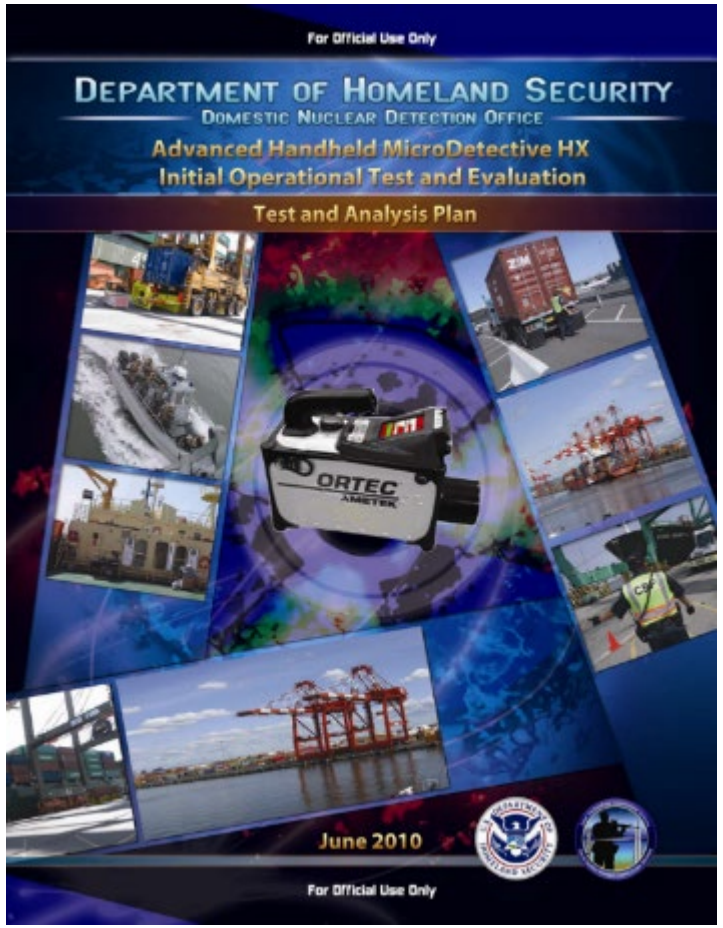




Risk Management and Technology Maturation

- Systems launch and operations.
- System development.
- Technology development and demonstration for each specific application before the beginning of full system development of that application.
- Focused technology development addressing specific technologies for once or more potential system applications.
- Basic research in new technologies and concepts (targeting identified goals and objectives, but not necessarily specific system requirements).

Integrated Test and Assessment



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Integrated Test and Assessment

- Integrated test and assessment is when a single test or assessment activity can provide data to satisfy multiple objectives as supported by an integrated test and assessment strategy.
- Integrated test and assessment may include combined contractor and government testing as well as integrated government developmental testing (DT) and operational testing (OT).
- Involves users and testers throughout the entire life cycle.
- When supported by the appropriate risk analysis, assessments can use data from integrated test events rather than a dedicated independent operational test event.

Note: DAU Test& Evaluation, https://aaf.dau.edu/dbs-test-evaluation

Integrated Test and Assessment

I. Introduction
- A. Program Overview
- B. Purpose
- C. System Description
- C. System Operating Concepts
- D. Event Overview
- F. Participating Organizations

II. Test Approach
- A. Test Design Overview
- B. Training
- C. Data Acquisition Plan
- D. Data Management and V&V
- E. Reporting
- F. Assessment Team Roles and Responsibilities
- G. Assumptions, Constraints, and Limitations

III. Analysis Approach
- A. Critical Operational Issues
- B. Analysis of Objectives

IV. Support Requirements
- A. Logistics
- B. Security
- C. Health and Safety
- D. Environmental Protection

V. Annexes
- A. References
- B. Test Procedures and Data V&V
- C. Data Trace
- D. Forms
- E. Questionnaires
- F. Equipment List
- G. Program Protection Plan
- H. Health and Safety Plan

Assessment Team Roles and Responsibilities

Lead Assessment Organization

- Organization is responsible for collecting, archiving, and analyzing data during assessment activities and providing a report of the results.

Assessment Lead

- Responsible for all aspects of the assessment and data collection effort.
- Oversees the Assessment Team and interfaces with the Technology Developer and other assessment stakeholders.
- Delivers daily briefings to the Assessment Team, users, and support personnel on safety and operational and physical security issues related to the event.
- Serves as a data collector, as needed.

Lead Analyst

- Serves as assistant Assessment Lead when necessary and as a Data Collector.
- Primary responsibility is to manage the data entry, verification, and analysis work in the field.
- Ensures that all data collectors enter information from their observation logs on a daily basis.

Data Collectors

- Responsible for observing assessment activities, completing daily observation logs, downloading electronic files, and entering collected data.
- Ensures users complete appropriate forms and questionnaires at the correct point in the assessment.
- Assist in the entry and verification of data.
- If permitted, photograph (record) assessment activities to document events.

Others

- Subject Mater Expert (SMEs), Engineers, Operations, Logistics, Photographers, IT Specialist, etc.

Assessment Team Roles and Responsibilities

Technology Developers

- Provide Assessor and User (if applicable) training on their respective technologies.
- Observe assessment activities on a non-interference basis.
- Provide maintenance support only if Assessors and/or Users (if applicable) have determined they cannot resolve a technology failure themselves.

Host Organization

- Provide the facilities for conducting the assessment.
- Provide experienced Users (if applicable).
- Provide the scenario (if applicable).
- Provide secure access (if needed) to communication and data storage capabilities.

Technology Users (if applicable)

- Provide demographic information on their backgrounds and experience levels.
- Participate in technology training.
- Operate the technologies under assessment.
- Participate in end-of-day hot wash briefings.
- Complete problem logs to document any technology failures that occur.
- Participate in interviews with the Lead Assessment Organization, as needed.
- Complete questionnaires to provide their subjective opinions of technology effectiveness, suitability, and mission impact.

Assessment Ethics

Based on the principles of objectivity (the lack of bias, judgement, and prejudice) and impartiality (equal treatment and fairness), the Assessments Team must conduct its activities related to adequacy, quality, and credibility.

- **Adequacy**
  - The amount of data and realism of assessment conditions must be sufficient to support the evaluation of the Critical Operational Issues (COIs) and other key assessment parameters.
- **Quality**
  - The assessment planning, control of assessment events, and the collection, analysis, and management of assessment data must provide clear and accurate assessment reports.
- **Credibility**
  - The conduct of the assessment and the collection, analysis, and management of assessment date must be separated from external influence and personal biases.

Learning Outcomes

- ✓ Identify the purpose of Assessment.
- ✓ Recognize the differences between Assessment and Test and Evaluation (T&E).
- ✓ Recognize the typical Assessment activities utilized throughout each stage of the acquisition process.
- ✓ Recognize how Assessment helps to manage program risks, issues, and opportunities.
- ✓ Recognize ways and values of combining T&E and Assessment as part of an Integrated Test and Assessment Plan (ITAP).
- ✓ Describe typical roles and responsibilities of key Assessment personnel.
- ✓ Recognize the ethical responsibilities of Assessment personnel.

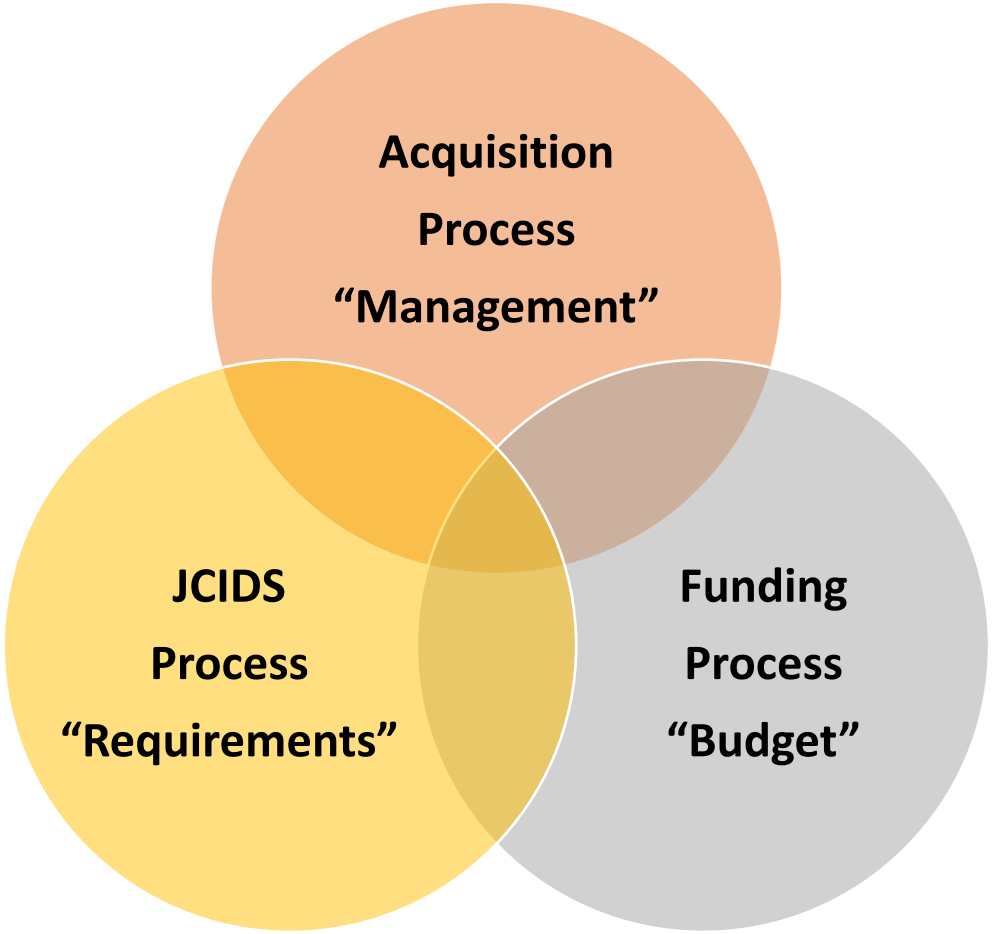
ASMT 101.U02

Identifying Assessment Requirements

Learning Expectations

- Identify key programmatic and Joint Capabilities Integration and Development System (JCIDS) documents and the role they play in Assessment.
- Define key assessment parameters, including Critical Technical Parameters (CTPs), Key Performance Parameters (KPPs), Measures of Effectiveness (MOEs), Measures of Suitability (MOSs), and Measures of Performance (MOPs).
- Recognize how key assessment parameters, including CTPs, KPPs, MOEs, MOSs, and MOPs, are used.
- Identify the main contents of a typical Integrated Assessment Plan (IAP).

JCIDS

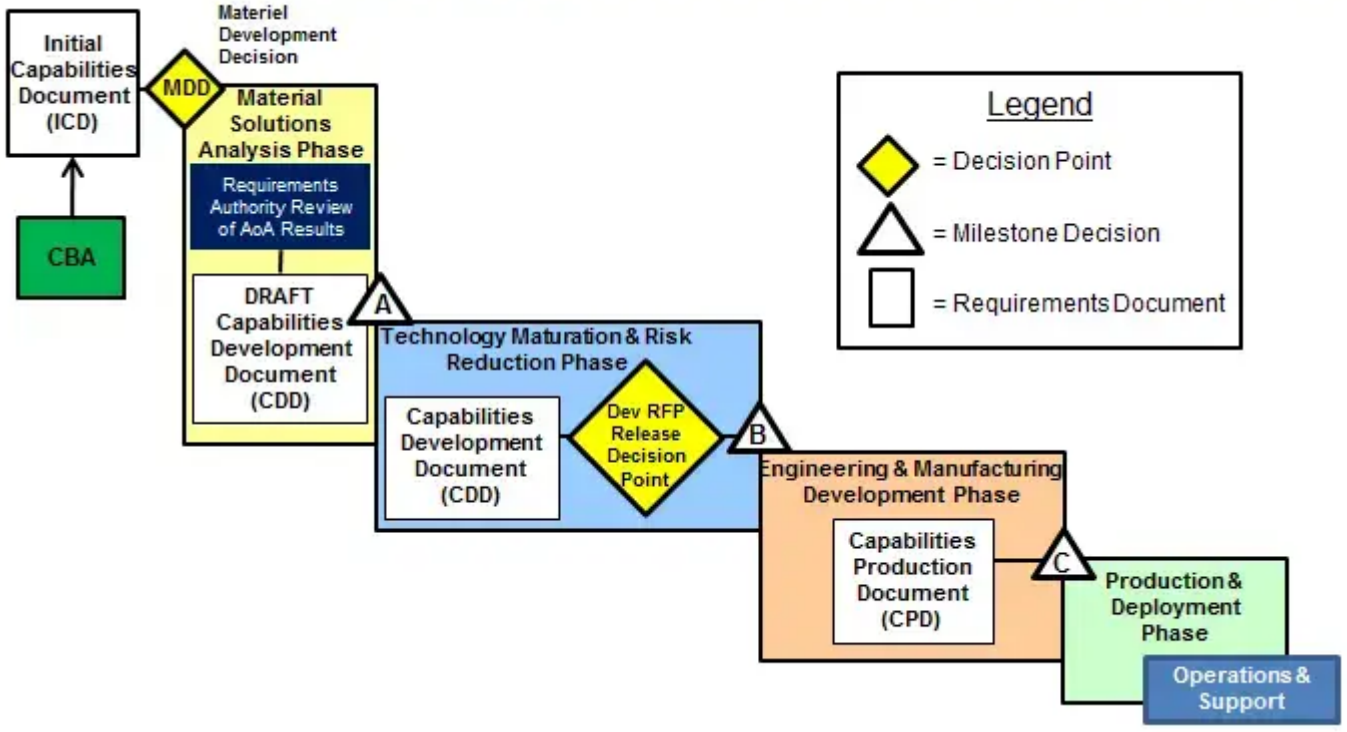


Note: JCIDS Process

Joint Capabilities Integration and Development System (JCIDS)

- The JCIDS process is one of three (3) processes (Acquisition, Requirements, and Funding) that support the Defense Acquisition System.
- Created to support the statutory responsibility of the Joint Requirements Oversight Council (JROC) to validate joint warfighting requirements.

Key Documents



Note: JCIDS Process

Key Documents include, but are not limited to:

- Initial Capabilities Document (ICD)
- Capabilities Development Document (CDD)
- Capabilities Production Document (CPD)
- System Threat Assessment Report (STAR)

Key Documents

Initial Capabilities Document (ICD)

- The ICD makes the case to establish the need for a materiel approach to resolve a specific capability gap.
- The ICD supports the analysis of alternatives (AoA), development of the TDS, and various milestone decisions.
- The ICD defines the capability gap in terms of the functional area(s), relevant range of military operations, time, obstacles to overcome, and key attributes with appropriate MOEs.
- Once approved, the ICD is not normally updated.

Key Documents

Capability Development Document (CDD)

- A CDD [includes the Information System (IS) CDD variant] specifies capability requirements in terms of developmental Key Performance Parameters (KPPs), Key System Attributes (KSAs), Additional Performance Attributes (APAs), and other related information necessary to support development of one or more increments of a materiel capability solution.
- A sponsor approved draft CDD is necessary for a Milestone A acquisition decision and each RFP release in support of the Technology Maturation and Risk Reduction (TMRR) phase of the Defense Acquisition System.
- A validated CDD is also necessary for each Development Request for Proposal (RFP) Release Decision Point and Milestone B acquisition decision.
- The CDD format is in the Joint Capabilities Integration and Development System (JCIDS) Manual, which is available online.

Key Documents

Capability Production Document (CPD)

- The Capability Production Document (CPD) captures the information necessary to support production, testing, and deployment of an affordable and supportable increment within an acquisition strategy.
- The CPD identifies, in threshold/objective format, the specific attributes that contribute most significantly to the desired operational capability.
- The CPD is prepared during the Engineering & Manufacturing Development (EMD) Phase to guide the Production and Deployment phase after the Critical Design Review (CDR) and is used to measure the contractor's delivery.
- The CPD is required for the Milestone C Review and must be certified prior to a program proceeding into the Production and Development (PD) Phase.

Key Documents

System Threat Assessment Report (STAR)

- A concise description of the projected future operational threat environment, the system-specific threat, the reactive threat that could affect program decisions, and when appropriate, the results of interactive analysis obtained when evaluating the program against the threat.
- Threat projections start at initial operational capability (IOC) and extend over the following 10 years.
- Provides the basis for the test design of threat scenarios and the acquisition of appropriate threat targets, equipment, or surrogates.
- Provides threat data for test and evaluation.

Assessment Parameters

Assessment Parameters include, but are not limited to:

- Critical Operational Issues (COIs)
- Critical Technical Parameters (CTPs)
- Key Performance Parameters (KPPs)
- Key System Attributes (KSAs)
- Measures of Effectiveness (MOEs)
- Measures of Suitability (MOSs)
- Measures of Performance (MOPs)

Applying Assessment Parameters

Critical Operational Issues (COIs)

- Key operational effectiveness or suitability issues that must be examined in operational test and evaluation to determine the system's capability to perform its mission.
- COIs must be relevant to the required capabilities and of key importance to the system being operationally effective, operationally suitable and survivable, and represent a significant risk if not satisfactorily resolved.
- A COI is normally phrased as a question that must be answered in the affirmative to properly evaluate operational effectiveness (e.g., “Will the system detect the threat in a combat environment at adequate range to allow successful engagement?”) and operational suitability (e.g., "Will the system be safe to operate in a combat environment?).
- COIs are critical elements or operational mission objectives that must be examined, are related to Measures of Effectiveness (MOE) and Measures of Suitability (MOS) and are included in the Test and Evaluation Master Plan (TEMP).

Applying Assessment Parameters

Critical Operational Issues (COIs) Examples

- A COI is normally phrased as a question that must be answered in the affirmative to properly evaluate operational effectiveness. The following are four examples of critical operational issues statements:
  - Will the platform/system (or subsystem/equipment) detect the threat in a combat environment at the adequate range to allow a successful mission?
  - Will the system be safe to operate in a combat environment?
  - Can the platform/system (or subsystem/equipment) accomplish its critical missions?
  - Is the platform/system (or subsystem/equipment) ready for Joint and, if applicable, Combined operations?

Note: https://acqnotes.com/acqnote/careerfields/critical-operational-issues

Applying Assessment Parameters

Critical Technical Parameters (CTPs)

- A measurable critical system characteristic that, when achieved, allows the attainment of a desired operational performance capability.
- CTPs are measures derived from desired user capabilities and are normally used in Developmental Test and Evaluation (DT&E).
- CTPs should have a direct or significant indirect correlation to key Capability Development Document (CDD), required system specifications or Concepts of Operation (CONOPS), and from technical performance measures as specified by the System Engineering Plan (SEP).
- CTPs should be focused on critical design features or risk areas.

Applying Assessment Parameters

Critical Technical Parameters (CTPs) Examples

- Altitude
- Availability
- Cost
- Cruising Speed
- Maintainability Issues
- Range
- Reliability
- Technical Maturity

Applying Assessment Parameters

Key Performance Parameters (KPPs)

- Performance attribute of a system considered critical or essential to the development of an effective military capability.
- KPPs are contained in the CDD and the updated CDD and are included verbatim in the Acquisition Program Baseline (APB).
- KPPs are expressed in term of parameters which reflect Measures of Performance (MOPs) using a threshold/objective format.
- KPPs must be measurable, testable, and support efficient and effective Test and Evaluation (T&E).
- Mandatory KPPs [Force Protection (FP), Survivability, Sustainment, Net-Ready (NR), Training, and Energy] are specified in the Joint Capabilities Integration and Development Systems (JCIDS) Manual.

Applying Assessment Parameters

Key Performance Parameters (KPPs) Examples

- Command and Control (C2) – Encompasses the exercise of authority and direction by a command over assigned and attached forces in the accomplishment of the mission.
  - Contact - detect/discriminate/classify type/identify friendly.
  - Information - ability to create, store, discover, access, modify, or reconfigure.
  - Accurate engagement decision/engagement sequence.
  - Automated mission planning.
  - Initial report accuracy.
  - Speed of initial report.
  - Communication throughput while mobile/non-mobile.
  - Interoperable.
  - Net ready.
  - Networked with specific sensors/units.
  - Waveform compatibility.
  - Works with legacy systems.
  - Internal growth.
  - Types of broadcast supported/scalability.

Applying Assessment Parameters

- Battlespace Awareness (BA) - The ability to understand dispositions and intentions as well as the characteristics and conditions of the operational environment that bear on national and military decision making by leveraging all sources of information to include Intelligence, Surveillance, Reconnaissance, Meteorological, and Oceanographic.
- Fires – To use available systems to create a specific lethal or nonlethal effect on a target.
- Movement and Maneuver - Disposing joint forces to conduct campaigns, major operations, and other contingencies by securing positional advantages before combat operations commence and by exploiting tactical success to achieve operational and strategic objectives.
- Protection - Conserving the joint force's fighting potential through active defensive measures, passive defensive measures, applying technology and procedures, and emergency management and response.
- Sustainment - The provision of logistics and personnel services necessary to maintain availability of materiel and support operations until mission accomplishment.

Note: https://jitc.fhu.disa.mil/jitc_dri/pdfs/jcids_manual_19jan12.pdf

Applying Assessment Parameters

Key System Attributes (KSAs)

- Performance attribute of a system considered important to achieving a balanced solution/approach to a system, but not critical enough to be designated as a Key Performance Parameter (KPP).
- KSAs must be measurable, testable, and support efficient and effective Test and Evaluation (T&E). KSAs are expressed in terms of Measures of Performance (MOPs).
- KSAs are listed in the Capability Development Document (CDD) and Capability Production Document (CPD).
- Availability, Reliability, and Ownership Cost are mandatory KSAs.

Applying Assessment Parameters

Key System Attributes (KSAs) Examples

- Availability - A measure of the degree to which an item is in an operable state and can be committed at the start of a mission when the mission is called for at an unknown (random) point in time.
- Reliability - The most common measures of reliability is Mean Time Between Failures (MTBF) or Mean Time Between Maintenance (MTBM).
- Ownership Cost - Total ownership cost (TOC) includes the elements of a program's life-cycle cost, as well as other related infrastructure or business processes costs not necessarily attributed to the program in the context of the defense acquisition system.

Note: https://acqnotes.com/acqnote/acquisitions/key-system-attributes

Applying to Assessment Parameters

Measures of Effectiveness (MOEs)

- The data used to measure the military effect (mission accomplishment) that comes from using the system in its expected environment.
- That environment includes the system under test and all interrelated systems, that is, the planned or expected environment in terms of weapons, sensors, command and control, and platforms, as appropriate, needed to accomplish an end-to-end mission in combat.
- MOEs should use assessment metrics that are measurable, quantifiable, adaptable, resourced, and pertinent.

Applying Assessment Parameters

Measures of Effectiveness (MOEs) Best Practices

- MOEs should use assessment Indicators that are relevant, measurable, responsive, and resourced so there is no false impression of task or objective accomplishment.
- MOEs should be easily understood and evaluated (complicated MOEs are more difficult to evaluate and can lead to confusion and a lack of understanding of the real issue).
- A mix of quantitative and qualitative indicators is used to evaluate MOEs to mitigate the risk of misinterpretation and overcome the limits of raw data in understanding complex situations.

Note: https://acqnotes.com/acqnote/tasks/measures-of-effectivenessrequirements

Applying Assessment Parameters

Developing Measures of Effectiveness (MOEs) Indicators

- The goal in developing MOEs is to create clear and appropriate "indicators" to inform an evaluation. An MOE could be expressed into five elements:
  - Short Title: the name.
  - Definition: a clear description of what is measuring.
  - Unit of Measure: may be quantifiable or qualitative.
  - Benchmark: a value that would define the desired state in terms of the particular aspect of the operational environment being measured.
  - Formula: an expression of how changes in the value affect the MOE (i.e., is it more or less better?).

Note: https://acqnotes.com/acqnote/tasks/measures-of-effectivenessrequirements

Applying Assessment Parameters

Characteristics of Measures of Effectiveness (MOEs) Indicators

- Relates to performance.
- Objective
- Simple to state.
- Testable
- Complete
- Clear
- States any time dependency.
- States any environmental conditions.
- Can be measured quantitatively (if required, may be measured statistically or as a probability).
- Easy to measure.
- Select only MOEs that measure the degree to which the desired outcome is achieved.
- Use the same MOEs to measure more than one condition when appropriate.
- Structure so that they have measurable, collectible, and relevant indicators.
- Write as statements (not questions).
- Maximize clarity

Note: https://acqnotes.com/acqnote/tasks/measures-of-effectivenessrequirements

Applying Assessment Parameters

Measures of Suitability (MOSs)

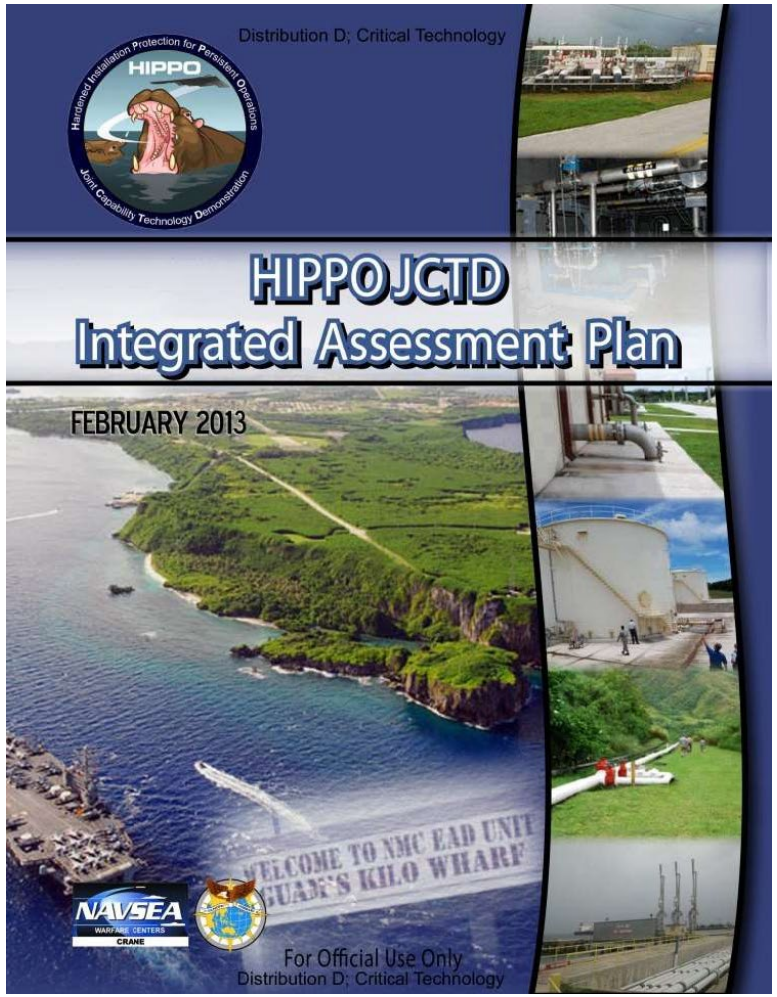
- Measure of an item's ability to be supported in its intended operational environment.
- MOSs typically relate to readiness or operational availability and, hence, reliability, maintainability, and the item's support structure.
- Several MOSs and/or Measures of Performance (MOPs) may be related to the achievement of a particular Measure of Effectiveness (MOE).

Applying Assessment Parameters

Measures of Performance (MOPs)

- System-particular performance parameters such as speed, payload, range, time-on-station, frequency, or other distinctly quantifiable performance features.
- MOPs are necessary for correlation to specific MOEs in order to determine the optimal levels of effort for objective achievement.
- A careful analysis of the relationship between MOPs and MOEs may reveal the need to shift courses of action (COAs) if the current plan is inefficient or have adverse effects.
- Several MOPs and/or Measures of Suitability (MOSs) may be related to the achievement of a particular Measure of Effectiveness (MOE).

Integrated Assessment Plan



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Integrated Assessment Plan (IAP)

- The IAP is normally prepared by the Assessment Team during the initial planning phase of the assessment program.
- The IAP provides the blueprint for the issues and objectives that the specific program utility assessment will address, the scenarios and conditions that will be addressed, and the data collection and reporting for each of the assessment issue objectives.

Integrated Assessment Plan

I. Overview
- A. Purpose and Scope
- B. Coalition / Joint / Interagency Operational Problem
- C. Desired Capabilities
- D. Capabilities Solution
- E. Top Level CONEMP or CONOP
- F. Operational View – 1 (Operational View-1)
- G. System View – 1 (System View-1)

II. Operational Assessment Approach
- A. Schedule
- B. Demonstration Venues and Participants
- C. Pre-Certification Opportunities and Aspects
- D. Procedures (aligned with TTPs)
- E. Data Requirements and Resources
- F. Constraints (as applicable)

III. Operational Utility Assessment Framework
- A. Coalition / Joint / Interagency Operational Problem
- B. Critical Operational Issues
- C. Top Level Capabilities and Metrics As Applied to Joint Functional Capability Area
- D. Measures of Performance (MOP) and Measures of Effectiveness (MOE)

IV. Operational Utility Assessment Reporting

V. Networks/Equipment/Facilities/Ranges/Sites

VI. Assessment Management
- A. Team
- B. Approach

VII. Acronyms and Terms

VIII. Glossary

IX. Related Documents

Exercise

COIs, MOEs, MOSs, and MOPs (COI Data Trace) ! ! !

Development Component	Question	Description	Inputs	Contained in...
System	*What is the technology/capability?*	The complete technology being assessed.	Industry Partner engagements, White Paper(s), Quad Charts, Implementation Directives	All documentation (***technology description***)
Critical Operational Issue (COI)	*Is the technology effective, suitable, significant, and sustainable?*	An overarching question that must be answered to properly evaluate operational effectiveness, suitability, and impact.	Standing COIs for P&E Assessments, White Papers, Quad Charts, Implementation Directives	TCW, COI Data Traces (*collaborative Excel versions*), IAP, TSEP, LOOs, AED, QLB, FLB, SVR ****COIs finalized immediately following initial contact and TCW completion****
Major Component	*How is the capability achieved?*	The base elements the system directly related to the overall capability.	Industry Partner engagements, White Paper(s), Quad Charts, Implementation Directives	IAP, TSEP, LOOs AED, SVR; **technology description**
Function	*What does the technology do to provide the capability?*	The discrete actions and activities performed by a system to provide the capability.	Industry Partner engagements, White Paper(s), Quad Charts, Implementation Directives	**IAP, TSEP, LOOs, AED, QLB, FLB, SVR; technology description**
Objective	*What will be learned?*	Statements that break down the COI into clearly defined manageable tasks and are developed to orient the measures needed to resolve the COI.	Industry Partner engagements, White Paper(s), Quad Charts, Implementation Directives, TCWs, Portfolio Team Engagements	TCW (*initial*), COI Data Traces (collaborative Excel workbooks), IAP, TSEP, AED, QLB (*as overview*), FLB (*as overview*), SVR ****Objectives refined throughout assessment process****
Measure of Effectiveness (MOE)	*How is performance connected to function?*	A quantitative or qualitative measure of the ability of a system to meet its requirements from a given perspective.	Industry Partner engagements, White Paper(s), Implementation Directives, SME engagements, Portfolio Team Engagements, Open-Source Research	COI Data Traces (*collaborative Excel workbooks*), IAP, TSEP, LOOs, AED, QLB, FLB, SVR ****MOEs refined throughout assessment process****
Measure of Performance (MOP)	*What are the components of function?*	A measure of a system's performance is expressed as speed, payload, range, time-on-station, frequency, or other distinctly quantifiable performance features.	Industry Partner engagements, White Paper(s), Implementation Directives, SME engagements, Portfolio Team Engagements, Open-Source Research	COI Data Traces (*collaborative Excel workbooks*), IAP, TSEP, LOOs, AED, QLB, FLB, SVR ****MOPs refined throughout assessment process****
Measure of Suitability (MOS)	*What enables function in a relevant environment?*	A measure of an item's ability to be supported in its intended operational environment. MOSs typically relate to readiness or operational availability and, hence, reliability, maintainability, and the item's support structure.	Industry Partner engagements, White Paper(s), Implementation Directives, SME engagements, Portfolio Team Engagements, Open-Source Research	COI Data Traces (*collaborative Excel workbooks*), IAP, TSEP,LOOs, AED, QLB (as overview), FLB (*as overview*), SVR ****MOS' refined throughout assessment process****
Indicators	*What observations will provide relevant data?*	Assessment metrics that are measurable, quantifiable, adaptable, resourced, and pertinent.	Industry Partner engagements, White Paper(s), Implementation Directives, SME engagements, Portfolio Team Engagements, Open-Source Research, Direct Observation of Technology	Descriptions of results in LOOs and SVRs.

Learning Outcomes

- ✓ Identify key programmatic and Joint Capabilities Integration and Development System (JCIDS) documents and the role they play in Assessment.
- ✓ Define key assessment parameters, including Critical Technical Parameters (CTPs), Key Performance Parameters (KPPs), Measures of Effectiveness (MOEs), Measures of Suitability (MOSs), and Measures of Performance (MOPs).
- ✓ Recognize how key assessment parameters, including CTPs, KPPs, MOEs, MOSs, and MOPs, are used.
- ✓ Identify the main contents of a typical Integrated Assessment Plan (IAP).

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Assessment Process

Learning Outcomes

- Identify the six main phases in the Assessment process.
- Identify the tasks, milestones, and documents associated with Phase One (Review/Refine Program Strategy).
- Identify the tasks, milestones, and documents associated with Phase Two (Review/Refine Mission Analysis).
- Identify the tasks, milestones, and documents associated with Phase Three (Issue Planning Guidance).
- Identify the tasks, milestones, and documents associated with Phase Four (Develop Plans and Resource Estimate).
- Identify the tasks, milestones, and documents associated with Phase Five (Plan, Execute, and Support Events).
- Identify the tasks, milestones, and documents associated with Phase Six (Consolidate and Report Demonstration Results).

Assessment Process (Six Phases)

The Assessment Process is framed by six phases (steps) starting with the development of assessment strategies and ending with the consolidation of reporting of assessment results.

- Review/Refine Program Strategy
- Review/Refine Mission Analysis
- Issue Planning Guidance
- Develop Plans and Resource Estimates
- Plan, Execute, and Support Events
- Consolidate and Report Demonstration Results

Phase One: Review/Refine Program Strategy

Review/Refine Program Strategy

- Starts the process of assisting the client with defining the scope of the test and assessment program and determining how it will be executed.
- Conducted in conjunction with the technology developer and the intended user (to include applicable transition personnel).
- Documented in a plan referred to as the Client Requirements Document (CRD). The CRD is the primary tool used to document the client's program scope, test and assessment support needs and requirements, user roles and responsibilities, operational issues for determining the utility of emerging or enabling technologies and capabilities, and reviews the program general test and assessment methods, processes, and procedures.

Phase One: Review/Refine Program Strategy

Review/Refine Program Strategy also includes, but is not limited to:

- Consolidate and review technology and assessment program information.
- Consolidate, review, or draft initial critical issues.
- Support client to establish integrated teams and working groups.
- Schedule and conduct the first assessment meeting.
- Establish a candidate list of mission-critical tasks for assessment.
- Draft potential new mission-critical tasks.
- Establish a candidate employment concepts list.
- Identify the key user community (e.g., operators, planners, and decision makers).
- Identify support requirements for the technology development team.

Phase One: Review/Refine Program Strategy

The CRD will include, but will not be limited to:

- Points of Contact
- Background
- Objectives
- Requirements
- Funding
- Milestones and Deliverables
- Approvals

Phase One: Review/Refine Program Strategy

Client Requirements Document

[Project Name]

[Project Date]

Client POC:	Assessment POC:
Title:	Title:
Organization:	Organization:
Address:	Address:
Phone:	Phone:
Email:	Email:

BACKGROUND
xxxxx

OBJECTIVES
xxxxx

REQUIREMENTS
xxxxx

DISCOVERY
xxxxx

STRATEGIES AND OBJECTIVES
xxxxx

PLANNING GUIDANCE
xxxxx

Click Doc To View

PLANNING
xxxxx

EXECUTION
xxxxx

REPORT RESULTS
xxxxx

FUNDING
xxxxx

MILESTONES AND DELIVERABLES
xxxxx

APPROVALS
xxxxx

[Name]	Date
[Title]	
[Organization]	

[Name]	Date
[Title]	
[Organization]	

Phase Two: Strategies and Objectives

Strategies and Objectives

- Develop and define the strategies and objectives of the test and assessment program and how that program will be executed to support user driven test and assessment requirements.
- This includes working with all stakeholders to include, but not limited to, the technology developer and the intended user.
- Assist the client with coordinating an operational mission analysis to create the framework for establishing employment concepts and procedures for the utility assessment.
- Provide support analysis to determine user sponsor support requirements to the technology developer and the test and assessment team.

Phase Two: Strategies and Objectives

Strategies and Objectives also include, but is not limited to:

- Review or refine mission analysis.
  - Conduct a preliminary mission analysis.
  - Schedule employment concepts workshop.
  - Conduct workshop.
  - Identify how the potential operational characteristics of the technology may affect existing policy and procedures.
  - Review critical issues and facilitate combined brainstorming session.
  - Hypothesize employment concepts, procedures, and mission-critical tasks in functional working groups.
  - Review critical issues.
  - Review list of mission-critical tasks.
  - Review employment concepts list and hypothesize other employment concepts, procedures, and mission-critical tasks.
  - Select employment concepts for assessment.

Phase Two: Strategies and Objectives

- Select mission-critical tasks for assessment and their associated critical measures and conditions.
- Define possible new mission-critical tasks with measures and conditions.
- Prioritize issues, mission-critical tasks, employment concepts, and procedures.
- Present issues, mission-critical tasks, employment concepts, and procedures.
- Validate and prioritize critical issues, mission-critical tasks, employment concepts, and procedures.
- Identify candidate locations for technology utility assessment.

• Review or refine program support analysis.

- Review known support requirement facts and develop assumptions for unknown support facts.
- Identify integrated product team (IPT) requirements.
- Determine user staff support requirements.
- Determine user component support requirements.
- Determine organizations that are willing and able to provide support.
- Develop support task list.

Phase Two: Strategies and Objectives

- Prepare and conduct mission analysis briefing.
  - Determine the program execution mission-critical task list by consolidating results, facts, and assumptions from operational and support mission analyses.
  - Assign tasks to organizations and IPTs for execution of the program mission-critical tasks identified above.
  - Identify IPT requirements and outline IPT and working group charters.
  - Establish agenda for briefing.
  - Schedule and conduct briefing.

Phase Two: Strategies and Objectives

Employment Concepts Workshop (aka, Warfighter Workshop)

Phase Three: Issue Planning Guidance

Issue Planning Guidance

- Providing planning guidance for the user sponsor assessment and support efforts.
- Planning guidance provides input for team charters, client management plans, and the Integrated Test Assessment Plan (ITAP) for the utility assessment.

Phase Three: Issue Planning Guidance

Issue Planning Guidance also includes, but is not limited to:

- Assessment Team Leader to draft team and working group charters for client approval.
- Assign a Client Management Plan (CMP) coordinator to consolidate planning results.
- Provide client management plan inserts to the client.
- Provide initial planning guidance.
- Provide operational mission analysis results to the client organization.
- Provide guidance for transitioning the emerging or enabling technology to identified user groups.
- Conduct reviews and provide subsequent guidance.

Phase Four: Develop Plans and Resource Estimate

Develop Plans and Resource Estimate includes, but is not limited to:

- The development of assessment plans and resources estimates.
- Support to the client during the development of the CMP, the ITAP, the resources estimate to support the program, and a decision briefing for execution approval.

Phase Four: Develop Plans and Resource Estimate

Develop Plans and Resource Estimate also includes, but is not limited to:

- Support Development of CMP (CMP Outline).
  - Situation (Background)
  - Mission (Client's Mission Statement)
  - Execution (Taskings, Instructions, and Guidance)
  - Administration and Logistics
  - Command and Control
- Develop ITAP.
  - Review and approve demonstration venues selected by the test and assessment.
  - Review and approve the concept for data collection provided by the test and assessment team leader to address the program assessment issues and objectives.
  - Review and approve example analytical products for each objective.
  - Set document review and publication timetables.

Phase Four: Develop Plans and Resource Estimate

- Support Development of a Technology Transition Plan (TTP).
  - Conduct mission analysis for program residuals.
  - Assess the scope of refurbishment and initial provisioning plans for residual(s).
  - Determine follow-on provisioning requirements for the remaining lifecycle of the program residual operational capabilities assets.
  - Prepare a memorandum of agreement (MOA) for provisioning requirements, training (operations and maintenance), and acceptance of residual asset(s).
  - Prepare operations and maintenance budget estimates.
  - Coordinate with identified user(s) to assume responsibility for program residual asset(s).
- Estimate Resources.
  - Determine the resource requirements for concepts development and operational documentation needs.
  - Determine the resource requirements for the technology utility assessment.
  - Determine the resource requirements for the user sponsor support to the development team.
  - Determine the resource requirements for the residual transition activities.

Phase Four: Develop Plans and Resource Estimate

- Set Briefing Milestone.
  - Prepare and present briefing.

Phase Five: Plan, Execute, and Support Events

Plan, Execute, and Support Events

- Serve as the lead assessment activity for planning and executing demonstration and assessment events.
- Support the client oversight effort for integration of demonstrations and assessments into existing events or operational missions and develops assessment reports.
- Continuously refine the CMP and ITAP missions, taskings, and objectives, and coordinates with the client to integrate the results of technology development and developer demonstrations and assessments.

Phase Five: Plan, Execute, and Support Events

Plan, Execute, and Support Events also includes, but is not limited to:

- Design Demonstration and Integrate into Events.
  - Validate or revise assessment objectives and concept recommendations for the demonstration event.
  - Determine if any special working groups are required for the demonstration planning or execution.
  - Issue assessment planning guidance.
  - Coordinate with the assessment demonstration hosts.
  - Coordinate and develop individual demonstration execution documents (DED).
  - Conduct demonstration assessment planning reviews.
  - Conduct demonstration service and support planning reviews.
  - Establish and review system operational documents.
  - Review and approve planning documents, DEDs, and reports.
  - Execute demonstration plan.

Phase Five: Plan, Execute, and Support Events

- Provide User Sponsor Support.
  - Identify schedules for key development phase demonstration or technical test events.
  - Assign the appropriate test and assessment team and user subject matter experts (SME) to participate and provide feedback.
  - Identify the milestone schedule for operational capabilities readiness reviews.
  - Provide system capability recommendations to the developer that improve technology utility during the test and assessment program.
  - Record on-site technical test or demonstration observations and prepare after-action report (AAR).

Phase Six: Consolidate and Report Demonstration Results

Consolidate and Report Demonstration Results

- Develop the utility assessment report for client approval and coordinates input for transitioning the emerging or enabling technology or capability to the identified user community.
- The consolidation of all test and assessment program supporting documents and determines disposition for operational documents created by the users and supports the development of a residual plan when residual asset(s) remain within the test and assessment program.
- Provide the requirements determined during (derive from) the test and assessment program.

Phase Six: Consolidate and Report Demonstration Results

Consolidate and Report Demonstration Results includes, but is not limited to:

- Analyze and Report Results during Assessment Events.
  - Follow the client's publication timetable.
  - Follow the client's review process.
  - Determine requirements for any briefings.
  - Ensure that the report has an operational direction to inform the program community of the user's perspective.
  - Approve the demonstration report, interim report, or summation report.
  - Follow the pre-coordinated program distribution plan.
  - Determine if the demonstration addressed the demonstration objectives.
  - Identify system changes to the developer, when necessary.

Phase Six: Consolidate and Report Demonstration Results

- Analyze and Report Results after Assessment Events.
  - Follow the client's publication timetable.
  - Follow the client's review process.
  - Determine requirements for any briefings.
  - Ensure that the report has an operational direction to inform the program community of the user's perspective.
  - Approve the demonstration report, interim report, or summation report.
  - Follow the pre-coordinated program distribution plan.
  - Determine if the demonstration addressed the demonstration objectives.
  - Request system changes to the developer, when necessary.
  - Consolidate and update operational documentation.

Phase Six: Consolidate and Report Demonstration Results

- Review and Approve Assessment Report.
  - Compare all demonstration reports with the program assessment plan.
  - Determine if all issues and objectives have been addressed satisfactorily with the user community.
  - Identify uncorrected shortfalls.
  - Determine the payoff for correcting uncorrected shortfalls.
  - Provide report.
  - Staff utility decision.
- Prepare Transition Packet
  - Prepare and assemble packet contents.
  - Provide utility decision to the client.
  - Provide recommendation for any residual program asset(s).
  - Provide the operational documentation created during the program by the user community and the user assessment team.
  - Provide transition recommendations and requirements.
  - Submit final utility assessment report.
  - Consider other actions.
  - Coordinate with the transition team.

Phase Six: Consolidate and Report Demonstration Results

Key Assessment Artifacts

- Client Management Plan (CMP)
- Assessment Plan [aka, the Assessment Execution Document (AED)]
- Integrated Assessment Plan (IAP)
- Demonstration Execution Document (DED)
- Quick Look Brief (QLB)
- Situation Reports (SITREPs)
- After Action Report (AAR)
- Lessons Learned
- Employment Concepts
- Systems Characteristics
- Final Assessment Report

Learning Outcomes

- ✓ Identify the six main phases in the Assessment process.
- ✓ Identify the tasks, milestones, and documents associated with Phase One (Review/Refine Program Strategy).
- ✓ Identify the tasks, milestones, and documents associated with Phase Two (Review/Refine Mission Analysis).
- ✓ Identify the tasks, milestones, and documents associated with Phase Three (Issue Planning Guidance).
- ✓ Identify the tasks, milestones, and documents associated with Phase Four (Develop Plans and Resource Estimate).
- ✓ Identify the tasks, milestones, and documents associated with Phase Five (Plan, Execute, and Support Events).
- ✓ Identify the tasks, milestones, and documents associated with Phase Six (Consolidate and Report Demonstration Results).

ASMT101.U04

Technical Demonstration (TD)

Learning Expectations

- Identify the focus, main activities, and products associated with TD.
- Identify key organizations involved in TD.
- Differentiate between TD, OD, and OA.
- Recognize ways and values of combining TD, OD, and OA activities.

Demonstration

What is a Demonstration?

- A demonstration is a verification method in which qualitative determination of properties is made for an end-item, including software and/or the use of technical data and documentation.
- Properties being verified are observed, but not measured, while the end-item is being operated or exercised in a dynamic state.
- This verification method requires no instrumentation or special test equipment beyond that inherent to the system under demonstration, and all data required for verification is obtained by observing operation of the system under demonstration.

Technical versus Operational

Innovative Concept	Emerging Technology	Enabling Technology	Capabilities
Technical Demonstration	**Operational Demonstration**	**Operational Assessment**	**Operations and Sustainment**
• Factory or Lab Visit • Vendor Demonstration • User Observation • Observation Plan • Observation Report	• Operational Environment • Vendor Demonstration • User Participation • Demonstration Plan • Demonstration Report	• Utility Assessment • Vendor Supported • User Participation • Assessment Plan • Assessment Report	• Terminate or Transition • New or Existing Program • Acquisition Plan • User Training • Operations and Sustainment • Lessons Learned
			
Ideation	**Demonstration**	**Test and Assess**	**Transition**

Technical Demonstration

Focus

- Technical Capabilities
- Technical Performance

Activities

- Vendor led demonstration.
- Vender determined location or at a location determined by the vendor and agreed to by the government (or visa-versa).
- Does not have to be in an operational relevant environment.

Products

- Results of the demonstration will provide initial verification of a system's claimed performance and capabilities (***it does what they say it will do***).

Learning Outcomes

- ✓ Identify the focus, main activities, and products associated with TD.
- ✓ Identify key organizations involved in TD.
- ✓ Differentiate between TD, OD, and OA.
- ✓ Recognize ways and values of combining TD, OD, and OA activities.

ASMT 101.U05

Operational Demonstration (OD)

Learning Expectations

- Identify the focus, main activities, and products associated with OD.
- Identify key organizations involved in OD.
- Differentiate between TD, OD, and OA.
- Recognize ways and values of combining TD, OD, and OA activities.

Technical versus Operational

Innovative Concept	Emerging Technology	Enabling Technology	Capabilities
Technical Demonstration	**Operational Demonstration**	**Operational Assessment**	**Operations and Sustainment**
• Factory or Lab Visit • Vendor Demonstration • User Observation • Observation Plan • Observation Report	• Operational Environment • Vendor Demonstration • User Participation • Demonstration Plan • Demonstration Report	• Utility Assessment • Vendor Supported • User Participation • Assessment Plan • Assessment Report	• Terminate or Transition • New or Existing Program • Acquisition Plan • User Training • Operations and Sustainment • Lessons Learned
			
Ideation	**Demonstration**	**Test and Assess**	**Transition**

Operational Demonstration

Focus

- Technical Performance and its Operational Relevance
- Technical Functionality and Operational Relevance of the Whole Capability

Activities

- Vendor led demonstration.
- Vender determined location or at a location determined by the vendor and agreed to by the government (or visa-versa).
- Takes place in an operationally relevant environment.

Products

- Results of the demonstration will verify and initially validate a system's claimed performance and operational capability.

Learning Outcomes

- ✓ Identify the focus, main activities, and products associated with OD.
- ✓ Identify key organizations involved in OD.
- ✓ Differentiate between TD, OD, and OA.
- ✓ Recognize ways and values of combining TD, OD, and OA activities.

ASMT 101.U06

Operational Assessment (OA)

Learning Expectations

- Identify the focus, main activities, and products associated with OA.
- Identify key organizations involved in OA.
- Differentiate between TD, OD, and OA.
- Recognize ways and values of combining TD, OD, and OA activities.

Technical versus Operational

Innovative Concept	Emerging Technology	Enabling Technology	Capabilities
Technical Demonstration	**Operational Demonstration**	**Operational Assessment**	**Operations and Sustainment**
• Factory or Lab Visit • Vendor Demonstration • User Observation • Observation Plan • Observation Report	• Operational Environment • Vendor Demonstration • User Participation • Demonstration Plan • Demonstration Report	• Utility Assessment • Vendor Supported • User Participation • Assessment Plan • Assessment Report	• Terminate or Transition • New or Existing Program • Acquisition Plan • User Training • Operations and Sustainment • Lessons Learned
			
Ideation	**Demonstration**	**Test and Assess**	**Transition**

Operational Assessment

Focus

- Does the capability solve operational issues and achieve mission task needs?

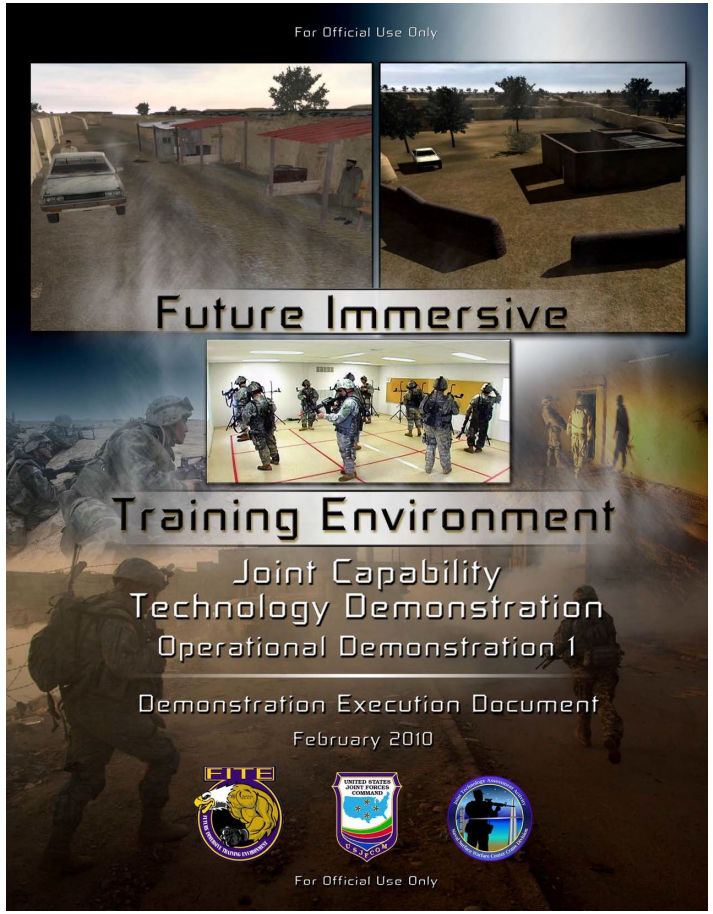
Activities

- Government led, vendor supported demonstration in an operational environment or the actual/intended user/component environment based on an overarching scenario and vignettes.
- User participation.

Products

- Verify and validate a system's claimed performance and operational capability leading to an informed acquisition decision.
- Demonstrate operational utility to support production-fielding decisions.

Integrated Demonstrations



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Key Aspects

- Integrated demonstrations require comprehensive demonstration and assessment planning that coordinates all demonstration and assessment stakeholders and activities.
- Integrated demonstrations produce the opportunity to collect both qualitative and quantitative data useful to all assessors to address developmental, sustainment, and operational issues early in the technology development process.
- Integrated demonstrations create shared assessment events in which a single assessment point can provide data to satisfy multiple objectives.
- Demonstration Execution Document (DED).

Learning Outcomes

- ✓ Identify the focus, main activities, and products associated with OA.
- ✓ Identify key organizations involved in OA.
- ✓ Differentiate between TD, OD, and OA.
- ✓ Recognize ways and values of combining TD, OD, and OA activities.

Exercise

Team Building Exercise (Marketplace)

Class Schedule

Day One

- 0800 – 0900 The Role of Assessment
- 0900 – 1000 Identifying Assessment Requirements
- 1000 – 1200 Assessment Processes
- 1200 – 1300 Break
- 1300 – 1400 Technology Demonstration
- 1400 – 1500 Operational Demonstration
- 1500 – 1600 Operational Assessment
- 1600 – 1700 Team Building Exercise

Day Two

- 0800 – 1000 Range of Assessments
- 1000 – 1100 Interoperability
- 1100 – 1200 Data Management
- 1200 – 1300 Break
- 1300 – 1500 Assessment Planning
- 1500 – 1700 Assessment Conduct

Day Three

- 0800 – 1000 Assessment Observation and Analysis
- 1000 – 1200 Assessment Reporting
- 1200 – 1300 Break
- 1300 – 1700 Assessment Practical Exercise

Day Four

- 0800 – 1200 Assessment Practical Exercise
- 1200 – 1300 End of Course Wrap Up

ASMT 101.U07

Range of Assessments

"The Secret Sauce"

Learning Expectations

- Identify the five different types of assessments.
- Recognize how Technology Readiness Levels (TRL) can be used to frame and support Assessment.
- Identify the focus, main activities, and products associated with a Technology Survey.
- Identify the focus, main activities, and products associated with a Technical Capability Test (TCT).
- Identify the focus, main activities, and products associated with a Technical Performance Evaluation (TPE).
- Identify the focus, main activities, and products associated with a System Integration Test (SIT).
- Identify the focus, main activities, and products associated with an Operational Utility Assessment (OUA).
- Distinguish between event-driven and schedule-driven Assessment.
- Describe how Assessment Readiness Reviews are used.

Key Aspects

Key Aspects

- The Range of Assessments provides the rigor (the formal, objective, and repeatable process) required to assess emerging and enabling technologies and bridge research and development (R&D) and prototyping to the prudent and practical application of those technologies.
- The Range of Assessments can be applied to the various tasks of assessment, and its application facilitates the demonstration, acceptance, modification, or rejection of emerging and enabling technologies on a rational basis.
- The Range of Assessments is scalable based on the complexity and duration of the technology and the event.

Range of Assessments

Potential to address a need?

TECHNOLOGY SURVEY

Does the tech solve an operational problem?

TECHNICAL CAPABILITY TEST

Determine tech performance and its operational relevance.

TECHNICAL PERFORMANCE EVALUATION

Determine tech functionality and its operational relevance to the whole capability.

SYSTEM INTEGRATION TEST

Does capability solve operational issues and mission task needs?

OPERATIONAL ASSESSMENT

MOE, MOP based driven by tech requirements and operational needs

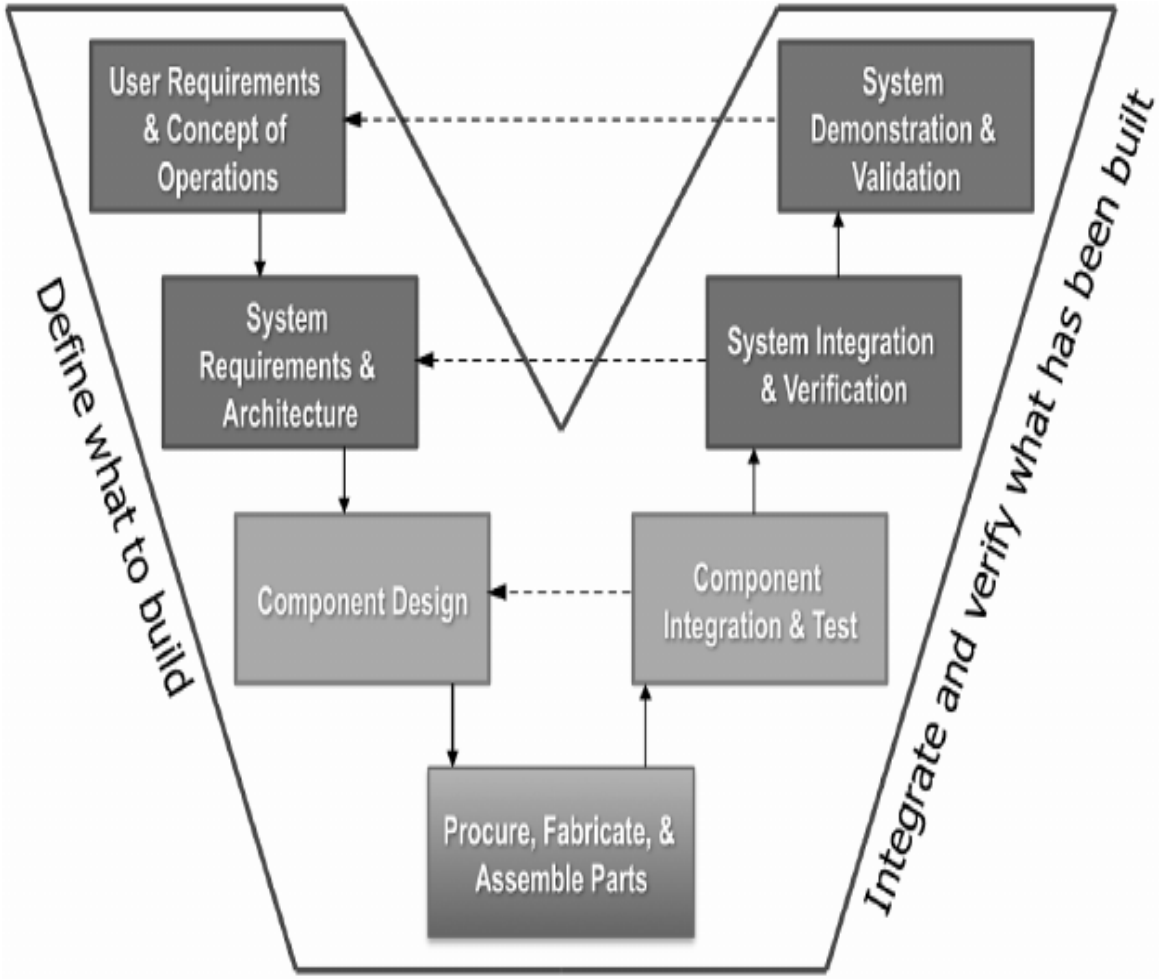
PROGRAM of RECORD DT/OT

Increasing Scope and Complexity = Increasing Costs and Duration

Technology Readiness Levels

DEPLOYMENT	TRL 9	Transition	Actual System Proven in Operational Environment
	TRL 8	Qualification	System Complete and Qualified
	TRL 7	Verification	System Prototype Demonstrated in Operational Environment
DEVELOPMENT	TRL 6	Demonstration	Technology Demonstrated in Relevant Environment
	TRL 5	Prototyping	Technology Validated in Relevant Environment
	TRL 4	Development	Technology Validated in Lab Research Environment
RESEARCH	TRL 3	Concept	Experimental Proof of Concept
	TRL 2	Feasibility	Technology Concept Formulated
	TRL 1	Research	Basic Principles Observed

Validation versus Verification



Validation

- The assessment of the operational test authority that the system is suitable for operations and continued production, if planned.

Verification

- The task of determining whether a system or product meets the requirements established for it.

Technology Survey

Question/Issue

- Potential to address a need (JUONS or other requirement).

Location

- Determined by the technology developer.

Duration

- Execute: 10-15 Working Days
- Report: 2-5 Working Days

Product

- Letter of Observation (LOO)

Decision

- Informs technology down selection and need for other assessment(s).
- Go/No-Go to another level of assessment.

Technical Capability Test

Question/Issue

- Demonstrate technical merit to solve an operational problem.

Location

- Determined by the technology developer with the concurrence of the government.

Duration

- Execute: 20-30 Working Days
- Report: 5-10 Working Days

Product

- Procedural test summary and data analysis brief or report.

Decision

- Informs and recommends technical development.
- Conclusions based on demonstrated technical, not operational performance.
- Continue or stop development or proceed to other level of assessment.

Technical Performance Evaluation

Question/Issue

- Determine technical performance and its operational relevance against a limited operational problem set.

Location

- In a suitable test facility/range to support operations.

Duration

- Execute: 45-90 Working Days
- Report: 10-15 Working Days

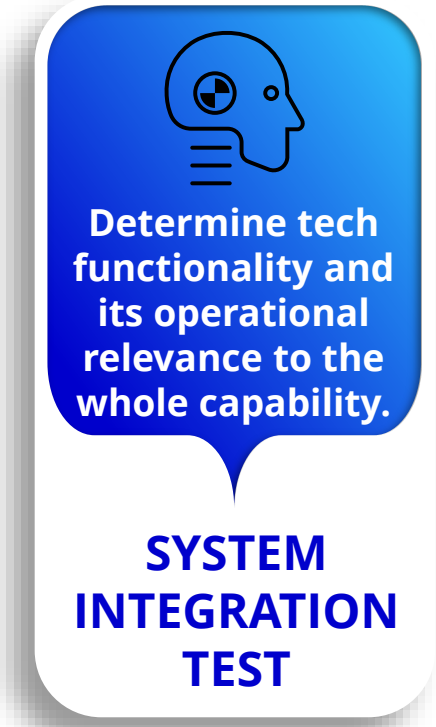
Product

- Technical Performance Evaluation Report

Decision

- Validate technical maturity, operational relevance, need for modification, cost, availability, and DOTMILPF or suitability and effectiveness attributes.
- Findings support TRL validation.

Systems Integration Test



Question/Issue

- Determine technical functionality and operational relevance of whole capability [the integration of the system(s)].

Location

- In a suitable test facility/range to support operations.

Duration

- Execute: 60-120 Working Days
- Report: 20-30 Working Days

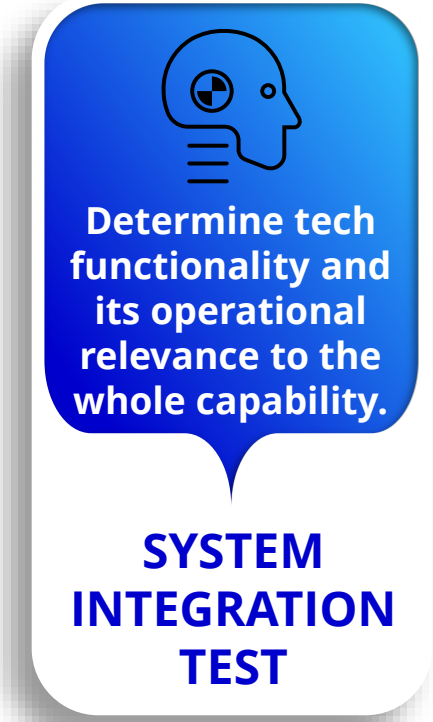
Product

- Functional and Operational Evaluation Report.

Decision

- Collapse DT/OT into system integration assessments to speed acquisition and fielding.
- Findings are impacted by the time and resources allocated to the test.

System Integration Test



Question/Issue

- Determine technical functionality and operational relevance of whole capability [the integration of the system(s)].

Location

- In a suitable test facility/range to support operations.

Duration

- Execute: 60-120 Working Days
- Report: 20-30 Working Days

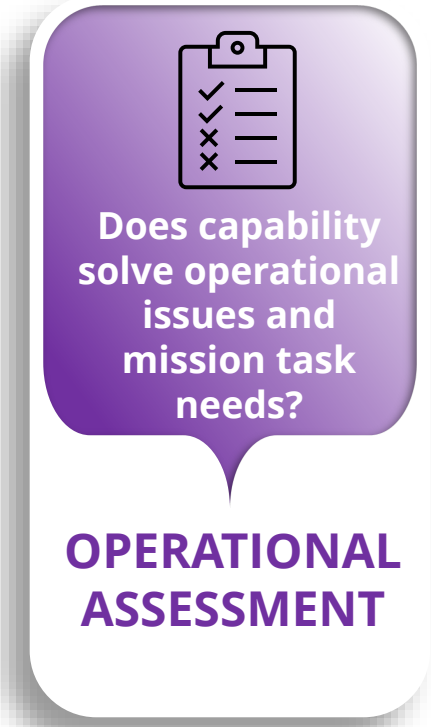
Product

- Functional and Operational Evaluation Report.

Decision

- Collapse DT/OT into system integration assessments to speed acquisition and fielding.
- Findings are impacted by the time and resources allocated to the test.

Operational Utility Assessment



Question/Issue

- Does capability solve operational issues and achieve mission task needs?

Location

- In representative environment with intended users.

Duration

- Execute: 60-120 Working Days
- Report: 5-30 Working Days

Product

- Operational Utility Assessment Report

Decision

- Demonstrate operational utility to support production-fielding decisions.
- Findings are impacted by the time and resources allocated to the test.
- Can support pre or post milestone activities (Acquisition Framework).

Program of Record (DT/OT)

Question/Issue

- MOE, MOP based driven technical requirements and operational needs concurrently.

Location

- Tailored to program needs.

Duration

- Execute: TBD based on individual programs.
- Report: 30-60 Working Days.

Product

- As required.

Decision

- Preliminary and critical design reviews and milestone requirements based on acquisition strategy.
- JCIDS documentation.

Range of Assessments

Type	Question/Issue	Plan-Execute-Report Cycle	Product & Delivery Time	Decision Support
Technology Survey	Potential to address need? (JUONS or other requirement).	10-15 workdays – vendor/developer visit.	Letter of Observation; 2-5 working days.	Go/No-Go to another level of assessment.
Technical Capability Test	Demonstrate technical merit to solve an operational problem.	20-30 workdays.	Procedural test summary and data analysis brief or report; 5-10 working days.	Continue or stop development or proceed to other level of assessment.
Technical Performance Evaluation	Determine technical performance and its operational relevance.	45-90 workdays (see note 1).	Technical Performance Evaluation Report; 10-15 working days.	Validate maturity, operational relevance, need for modification, cost, availability.
System Integration Test	Determine technical functionality and operational relevance of whole capability.	60-120 workdays (see note 1).	Functional and Operational Evaluation Report; 20-30 working days.	Collapse DI/OT into system integration assessments to speed acquisition and fielding.
Operational Assessment	Does capability solve operational issues and achieve mission task needs?	60-120 workdays (see note 1).	JCTD style Operational Utility Assessment Report; Quick Look Brief 5 working days; report 30 working days.	Demonstrate Operational Utility to support production-fielding decisions.
Program of Record DT/OT	MOE, MOP based driven by technical requirements and operational needs concurrently.	Tailored to individual program (see note 2).	Above and as required by DOD 5000 series, system acquisition; 30-60 working days.	Preliminary & Critical Design Reviews & Milestone Requirements based on acquisition strategy.

Increasing Cost/Duration

1. Depends on number of like capabilities under evaluation and complexity of performance trials.
2. May utilize all described types of assessment under Title 10 to enable systems acquisition process through milestones.

Event versus Schedule

Event Driven Assessment

- Formulated at the start of a technology assessment program.
- Links assessment decisions to demonstrated accomplishments in development, testing, and initial production.
- Constitutes a broad set of concepts that provide direction and control for the overall assessment effort.
- Level of detail reflected in the technology assessment program increases as the technology under assessment matures.
- It is critical that Assessment interests are represented during technology program development to ensure all program decisions are supported by adequate demonstration and assessment results.

Event versus Schedule

Schedule Driven Assessment

- The assessment is performed and managed under an overriding constraint of time.
- The assessment becomes schedule driven when the sponsor or the customers determines time constrains the assessment process.
- The management of the assessment process is primarily based on the delivery date of the final report.
- Time is a key consideration for making assessment related decisions.
- Scheduling (and completing) the assessment activity is prioritized over other considerations and activities.

Assessment Readiness Review

Assessment Readiness Review

- The Assessment Readiness Review (ARR) will determine if assessment procedures are complete.
- The ARR will assure that the technology developer and/or vendor is prepared for formal assessment.
- Assessment procedures will be evaluated for compliance with assessment plans and for adequacy in accomplishing assessment requirements.
- The ARR is conducted at the end of assessment planning and prior to assessment conduct.

Assessment Readiness Review

Assessment Readiness Review Questions

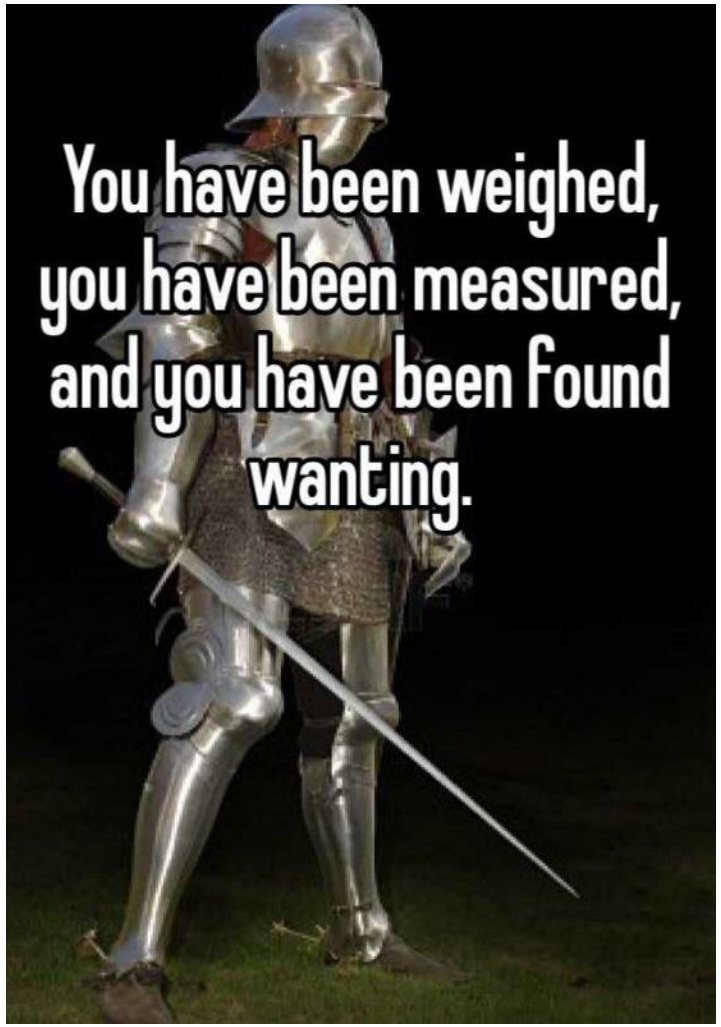
- Why are we assessing?
- What is the purpose of the planned assessment?
- Does the planned assessment verify a requirement that is directly traceable back to a system specification or other program requirement?
- What are we assessing (subsystem, system, a system of systems, other)?
- Is the configuration of the system under assessment sufficiently mature, defined, and representative to accomplish planned assessment objectives and/or support defined program objectives?
- Are we ready to begin assessment?
- Have all planned preliminary assessments been conducted, and are the results satisfactory?
- What is the expected result and how can/do the assessment results affect the program?
- Is the planned assessment properly resourced (people, test articles or articles, facilities, data systems, support equipment, logistics, etc.)?
- What are the risks associated with the assessment and how are they being mitigated?
- What are the hazards and Environment, Safety, and Occupational Health (ESOH) risks associated with the specific assessment?
- Have the necessary safety releases, spectrum clearances, airspace clearances, etc., been provided to the technology developer and/or the assessors prior to the conduct or any assessment?
- What is the fallback plan should a technical issue or potential showstopper arise during assessment?

Assessment Readiness Review

Assessment Readiness Review Criteria

- Completed and approved assessment plans for the system under assessment.
- Completed identification and coordination of required assessment resources.
- The judgment that previous component, subsystem, and system assessment results form a satisfactory basis for proceeding into planned assessments.
- Identified risk level acceptable to the program leadership.

Assessment Readiness Review



Assessment Readiness Review Board (the Evaluators)

- Program Manager
- Director of Assessments
- Technical Advisor
- Test Engineer
- Logistician
- Safety
- Communications
- User Community
- Other Subject Matter Expert(s)

Exercise

Planning Tool: Technology Coordination Worksheet

Introduce Technology that will be planned for and assessed as part of the practical exercise.

- Handheld GPS Device (Oregon 550t)
- Mobile GPS Device (Garmin)
- Cell Phone (Samsung S23+)
- Starlink Terminal

Learning Outcomes

- ✓ Identify the five different types of assessments.
- ✓ Recognize how Technology Readiness Levels (TRL) can be used to frame and support Assessment.
- ✓ Identify the focus, main activities, and products associated with a Technology Survey.
- ✓ Identify the focus, main activities, and products associated with a Technical Capability Test (TCT).
- ✓ Identify the focus, main activities, and products associated with a Technical Performance Evaluation (TPE).
- ✓ Identify the focus, main activities, and products associated with a System Integration Test (SIT).
- ✓ Identify the focus, main activities, and products associated with an Operational Utility Assessment (OUA).
- ✓ Distinguish between event-driven and schedule-driven Assessment.
- ✓ Describe how Assessment Readiness Reviews are used.

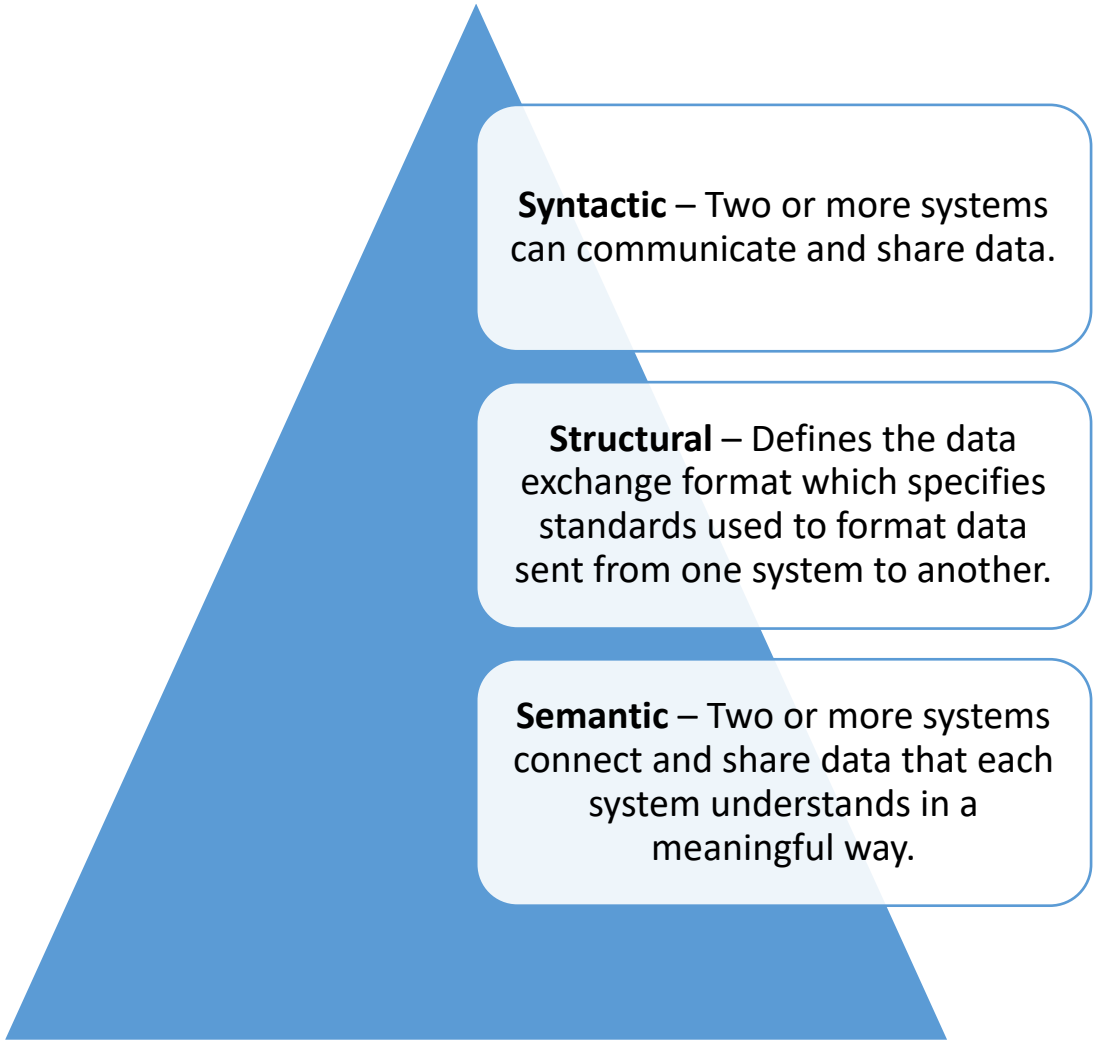
ASMT 101.U08

Interoperability

Learning Expectations

- Identify key aspects of assessing interoperability.
- Describe the role of the Joint Interoperability Test Command (JITC) in interoperability assessment.

Interoperability



Key Aspects

- Interoperability is a characteristic of a system to work with other systems.
- Interoperability testing verifies the compatibility of different systems, applications, or devices.
- Interoperability testing ensures that data exchange and functionality are consistent and reliable across various platforms and environments.
- Interoperability is not Integration (connecting systems, applications, and devices so that data from one can be accessed by the other one).

Joint Interoperability Test Command (JITC)

- JITC tests technologies that pertain to the multiple branches of the armed services and government.
- DoD's only Joint Interoperability Certifier and non-Service Operational Test Agency for Information Technology (IT)/National Security Systems.
- JITC is the premier test and evaluation organization advancing global net-centric testing in support of warfighting capabilities.
- Provides risk-based Test Evaluation & Certification (TE&C) services, tools, and environments to ensure Joint Warfighting IT capabilities are interoperable and support mission needs.

Note: https://jitc.fhu.disa.mil

Learning Outcomes

- ✓ Identify key aspects of assessing interoperability.
- ✓ Describe the role of the Joint Interoperability Test Command (JITC) in interoperability assessment.

ASMT 101.U09

Data Management

Learning Expectations

- Identify key aspects of data management in Assessment.
- Identify criteria for determining data management requirements.
- Describe the elements of an assessment database.

Data Management

Key Aspects

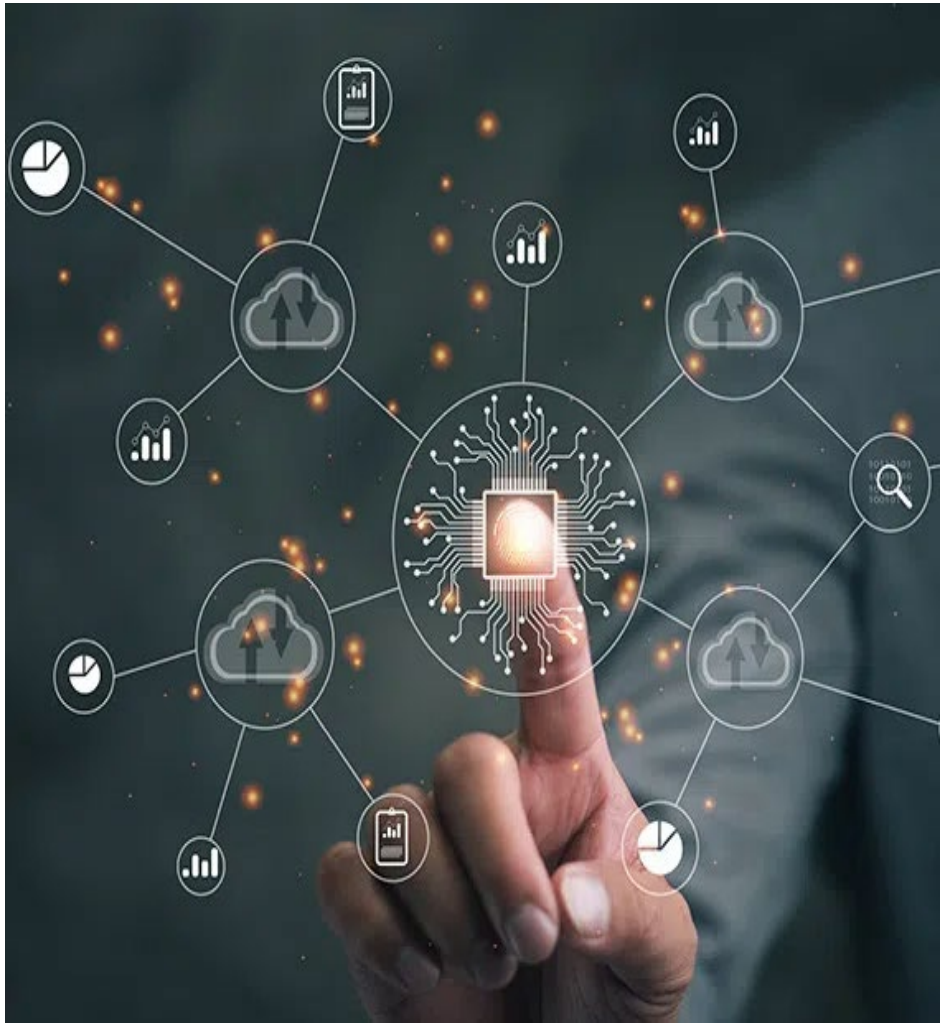
- Data requirements for all assessment efforts must be identified early in the planning process.
- Data management and governance are essential aspects of the assessment process to ensure the quality, security, and efficiency of the assessment process.
- Data management involves the creation, storage, maintenance, and disposal of assessment data.
- Data governance defines the policies, roles, and responsibilities for assessment data usage and protection.

Data Management

Determine Data Management Requirements

- Understand assessment data sources (where you obtain or generate the assessment data).
- Define data management policies and procedures and ensure they align to polices and procedures for your organization or program.
- Implement a data governance framework (roles, responsibilities, and processes) to monitor, control, and improve assessment data quality, security, and compliance.
- Apply data quality management practices to ensure assessment data meets the expectations and needs of the users and stakeholders.
- Put into place data security and privacy measures to protect assessment data from unauthorized access, use, disclosure, modification, or destruction.
- Conduct data management audits and reviews that evaluate and verify data management performance and governance and identify and address gaps, errors, and risks in data management processes, policies, and procedures.

Assessment Database



Elements of an Assessment Database

- An organized repository of related information stored in a manner that enables it to be easily accessed, managed, and updated.
- Used for the systematic storage, retrieval, and modification of information for analysis.
- Databases can be:
  - Hierarchical (data is stored in a tree-like or parent-child structure).
  - Network (hierarchical structure allowing for child data to be linked to multiple parents).
  - Object-Oriented (data is stored as objects).
  - Relational (data is stored in a tabular structures to enable scalability, efficiency, and quick-to-respond queries).

Learning Outcomes

- ✓ Identify key aspects of data management in Assessment.
- ✓ Identify criteria for determining data management requirements.
- ✓ Describe the elements of an assessment database.

ASMT 101.U10

Assessment Planning

Learning Expectations

- Identify key aspects of Assessment Planning.
- Recognize how capabilities are translated into assessment criteria.
- Describe typical assessment planning metrics.
- Identify guidelines for assessment management.
- Describe the key elements of a Technology Survey Execution Plan (TSEP).
- Describe the key elements of an IAP.

Assessment Planning

Key Aspects

- Planning is the most important part of the assessment process.

Assessment Criteria

Characteristics of a Good Assessment

- Reliable – Reliability is the consistency of a measure (whether the results can be reproduced under the same conditions).
- Valid – Validity refers to the accuracy of a measure (whether the results really do represent what they are supposed to measure).
- Objective – Objectivity refers to the lack of favoritism toward one side or another (freedom from bias).
- Usable – Usability focuses on how well stakeholders understand and use the assessment products to achieve their goals.

Assessment Planning Metrics

- **Scope**
- **Schedule**
- **Resources**
- **Environment**
- **Tools**
- **Risk Management**
- **Exit Criteria**

✓**Actionable** – Capable of being acted on (actionable information).

✓**Accessible** – Able to be reached and easily understood.

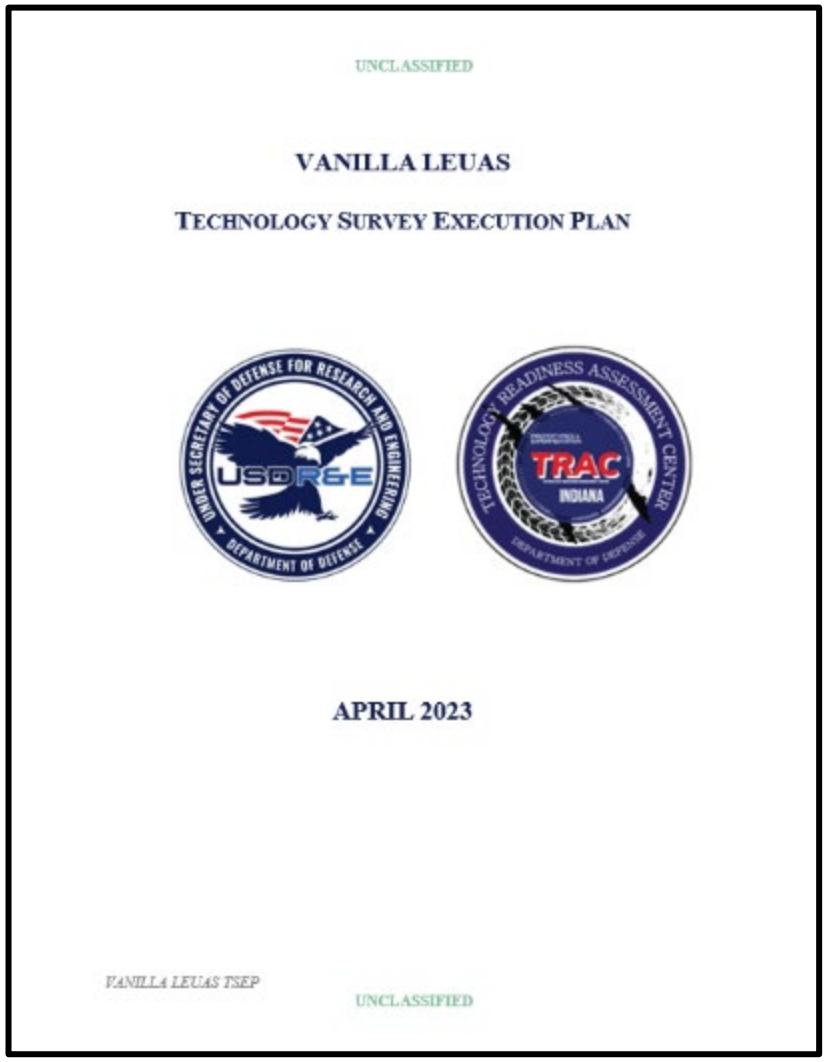
✓**Auditable** – Able to be verified or confirmed (qualified).

Assessment Management

Identify the primary tasks and activities required to be performed so that all aspects of a system (or systems) demonstrated are adequately assessed.

- The resources and support requirements required for all phases of the assessment.
- Assessment objectives and metrics.
- Program schedule with assessment events and reporting requirements that incorporate report generation timelines.
- Assessment phase objectives to include entrance and exit criteria.
- Program decisions and data requirements to support those decisions.
- Data collection requirements.
- Funding sources for all assessment resources.

Body of Evidence – TSEP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VANILLA LEUAS

TECHNOLOGY SURVEY EXECUTION PLAN

APRIL 2023

VANILLA LEUAS TSEP

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Technology Survey Execution Plan (TSEP)

- The TSEP provides the data and collection plan for the Baseline Assessment developed by the Assessment Team to initially assess a technology's potential to address a need.
- Based on the outcomes of the Baseline Assessment, the TSEP may be modified and updated to support a potential Functional Assessment to assess the technical merit of a technology to solve an operational problem.
- The TSEP serves as the foundational document, along with the IAP, to develop the Assessment Execution Document (AED).

EXEMPLAR – F2DR TSEP

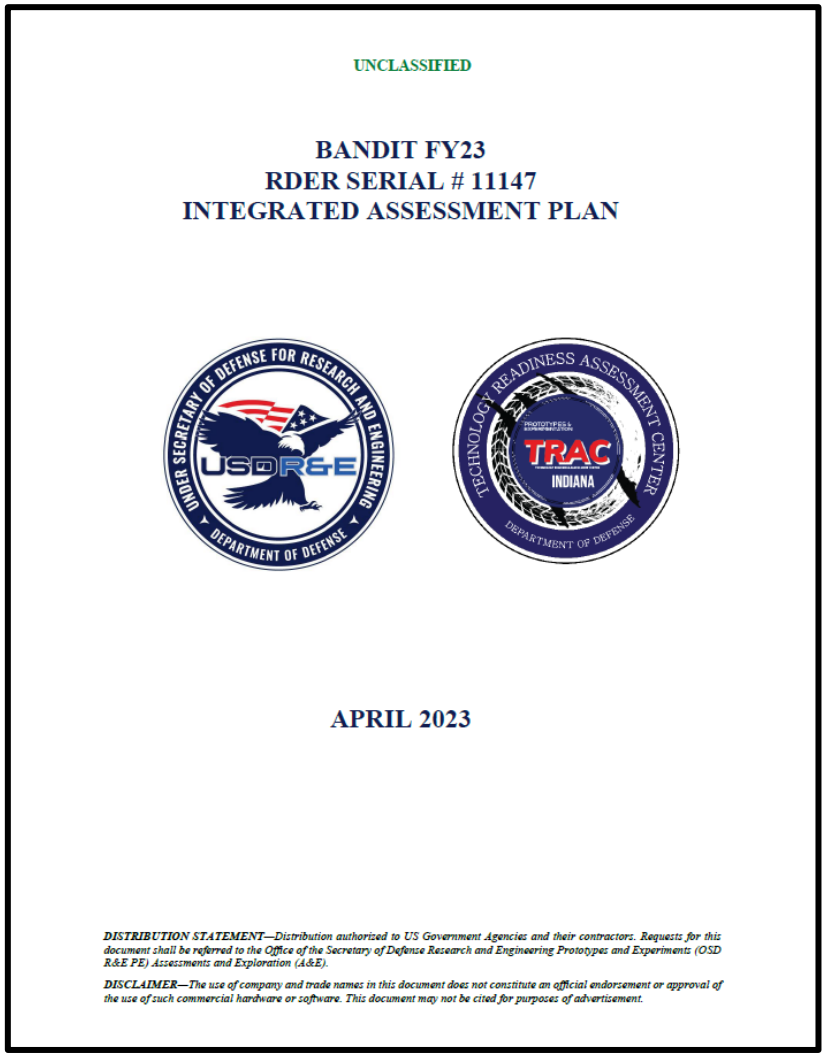
Body of Evidence – TSEP

I. Introduction
- A. Purpose
- B. Background
- C. Operational Problem
- D. Technology Description
- E. Top Level CONEMP Approach
- F. Objectives and General Assessment Approach

II. Execution
- A. Location
- B. Technology Survey Schedule
- C. Scenario
- D. Limitations and Constraints

III. Assessment Methodology
- A. Data Sources
- B. Report Plan
- C. Top Level Capabilities and Metrics
- D. Approach to the Objectives
- E. COI 1 (Performance Effectiveness)
- F. COI 2 (Usability)
- G. COI 3 (Mission Impact)
- H. COI 4 (Exportability)

Body of Evidence – IAP



UNCLASSIFIED

BANDIT FY23
RDER SERIAL # 11147
INTEGRATED ASSESSMENT PLAN

APRIL 2023

DISTRIBUTION STATEMENT—Distribution authorized to US Government Agencies and their contractors. Requests for this document shall be referred to the Office of the Secretary of Defense Research and Engineering Prototypes and Experiments (OSD R&E PE) Assessments and Exploration (A&E).

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Integrated Assessment Plan (IAP)

- The IAP provides an overview of the general assessment approach that will apply to an entire program. It is generally written at the start of a multi-year program to present the assessment organization's approach for the life of the program.
- The IAP ensures demonstrations and assessments are conducted in a coordinated and integrated manner, and that the results are used to inform decisions regarding further development, procurement, or deployment of the technology.

Body of Evidence – IAP

Tips for Drafting the IAP

- Three basic sections: (1) Overview, (2) Assessment Methodology, and (3) Assessment Framework.
- Strive to keep the IAP around 20 pages. Most other assessment documents will be around 10 pages.
- Focus on the methodological approach since that is the primary purpose of an IAP.
- Save the field execution and logistics for the event-specific AEDs.
- Place all information in the main hard copy document. Whereas AEDs and reports may use hyperlinks or annexes to access more detailed information, the IAP will be self-contained primarily in the main body.

Body of Evidence – IAP

I. Introduction
- A. Purpose
- B. Background
- C. Operational Problem
- D. Key Objectives
- E. Technology Description
- F. Top Level Concept of Operation (CONOP) Approach
- G. Objectives and General Assessment Approach
- H. Integrated Management Team (IMT) Participants

II. Demonstration Methodology
- A. Demonstration Schedule
- B. Demonstration Description
- C. Training
- D. Limitations and Constraints

III. Assessment Methodology
- A. Data Sources
- B. Assessment Team Organization
- C. Data Management and Analysis
- D. Reporting Plan
- E. Top Level Capabilities and Metrics
- F. Approach to the Objectives
- G. COI 1 (Performance Effectiveness)
- H. COI 2 (Usability)
- I. COI 3 (Mission Impact)
- J. COI 4 (Exportability)

IV. Annex A (Data Collection Forms)
- A. Observation Log
- B. Test Incident Report (TIR)
- C. DOTMLPF-P Observations
- D. Constraints and Limitations data Collection Form

V. Annex B (Assessment Activities)
- A. A&E Assessment Process
- B. TD Pre-Assessment Activities
- C. TD Event Execution
- D. OD Pre-Assessment Activities
- E. OD Event Execution
- F. OA Pre-Assessment Activities
- G. OA Event Execution

VI. Annex C: Crosswalk
- A. Requirements Cross Walked to Assessment Measures
- B. Assessment Measures Cross Walked to Experimentation Event

VII. Annex D: Acronyms

VIII. Annex E: Units of Measure

IX. Annex F: Glossary

X. Annex G: References

Learning Outcomes

- ✓ Identify key aspects of Assessment Planning.
- ✓ Recognize how capabilities are translated into assessment criteria.
- ✓ Describe typical assessment planning metrics.
- ✓ Identify guidelines for assessment management.
- ✓ Describe the key elements of a Technology Survey Execution Plan (TSEP).
- ✓ Describe the key elements of an IAP.

Exercise

Draft a TSEP to conduct a Technology Survey of:

- Handheld GPS Device (Oregon 550t)
- Mobile GPS Device (Garmin)
- Cell Phone (Samsung S23+)
- Starlink Terminal

ASMT 101.U11

Assessment Conduct

Learning Expectations

- Identify key aspects of conducting an Assessment.
- Describe the main steps in conducting an Assessment.
- Identify common data sources and data errors.
- Identify pre-assessment, during-assessment, and post-assessment events.
- Describe the key elements of a Demonstration Execution Document (DED).
- Describe the key elements of an Assessment Execution Document (AED).

Assessment Conduct

Key Aspects

- Conduct is the most important part of the assessment process.

Technical versus Operational

Technical Demonstration

- Factory or Lab Visit
- Vendor Demonstration
- User Observation
- Observation Plan
- Observation Report

Operational Demonstration

- Operational Environment
- Vendor Demonstration
- User Participation
- Demonstration Plan
- Demonstration Report

Operational Assessment

- Utility Assessment
- Vendor Supported
- User Participation
- Assessment Plan
- Assessment Report

Acquisition and/or Transition

- Terminate or Transition
- New / Existing Program
- Acquisition Plan
- User Training
- Operations and Sustainment
- Lesson Learned

Assessments

Experiments

Range of Assessment

Potential to address a need?

TECHNOLOGY SURVEY

- Factory or Lab Visit
- Vendor Demonstration
- Establishes Technical Baseline
- Go/No-Go Decision to Proceed Further for Assessment

Demonstrate technical merit to solve an operational problem.

TECHNICAL CAPABILITY TEST

- Relevant Environment
- Vendor Demonstration
- Procedural Test to Determine Technical Merit
- Go/No-Go Decision Point

Determine technical performance and its operational relevance.

TECHNICAL PERFORMANCE EVALUATION

- Relevant Environment
- Vendor Demonstration
- Validate Maturity and Operational Relevance
- Go/No-Go Decision Point

Goal of the Assessment Process

During a technology's tenure under assessment, the Assessment Team aims to accomplish:

- **1st** – A **Baseline Assessment** during a Technology Survey that demonstrates a technology's baseline performance and readiness for further assessment (TRL 4 or better).
- **2nd** – A **Functional Assessment** during a Technical Capability Test (TCT) or Technical Performance Evaluation (TPE) that demonstrates a technology can function at the defined baseline outside the laboratory environment (TRL 5).
- **3rd** – A **Vignette Assessment** during the TPE that demonstrates the technology can operate in a complex, relevant environment while demonstrating multiple functionalities at once (TRL 6).

Baseline Assessment

What is a Baseline Assessment?

- First step of the assessment process.
- A structured interview of the engineering team.
  - Provides assessors with an understanding of the operation of the technology.
  - Review the current status of the initiative.
- Measure basic performance characteristics of technologies against specifications provided by vendor.
  - Measures collected should answer the question "**Does this system do what the vendor claims it can do?**"
  - Identifies abilities and limitations of each technology individually before moving on to the next stage of assessment.

When is a Baseline Assessment performed?

- During the Technology Survey.

Baseline Assessment

What is a Baseline Assessment?

- First step of the assessment process.
- A structured interview of the engineering team.
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  - Measures collected should answer the question "**Does this system do what the vendor claims it can do?**"
  - Identifies abilities and limitations of each technology individually before moving on to the next stage of assessment.

When is a Baseline Assessment performed?

- During the Technology Survey.

Baseline Assessment

Exemplar – BANDIT LOO

Functional Assessment

What is a Functional Assessment?

- Second step of the assessment process.
- A Functional Assessment focuses on measuring the technology's performance within a narrowly defined set of objectives in a semi-complex environment.
- Serves as a stepping-stone between baseline and vignette-based assessments.
- Functional Assessment events should focus on proving a single objective at a time.

When is a Functional Assessment performed?

- During a TCT if the technology is slated for another Risk Reduction Event (RRE) between its Technology Survey and Technical Performance Evaluation.
- During a TPE.
  - Should comprise most of the demonstration and assessment event.

Functional Assessment

Exemplar – Vanilla LEUAS

Vignette Assessment

What is a Vignette Assessment?

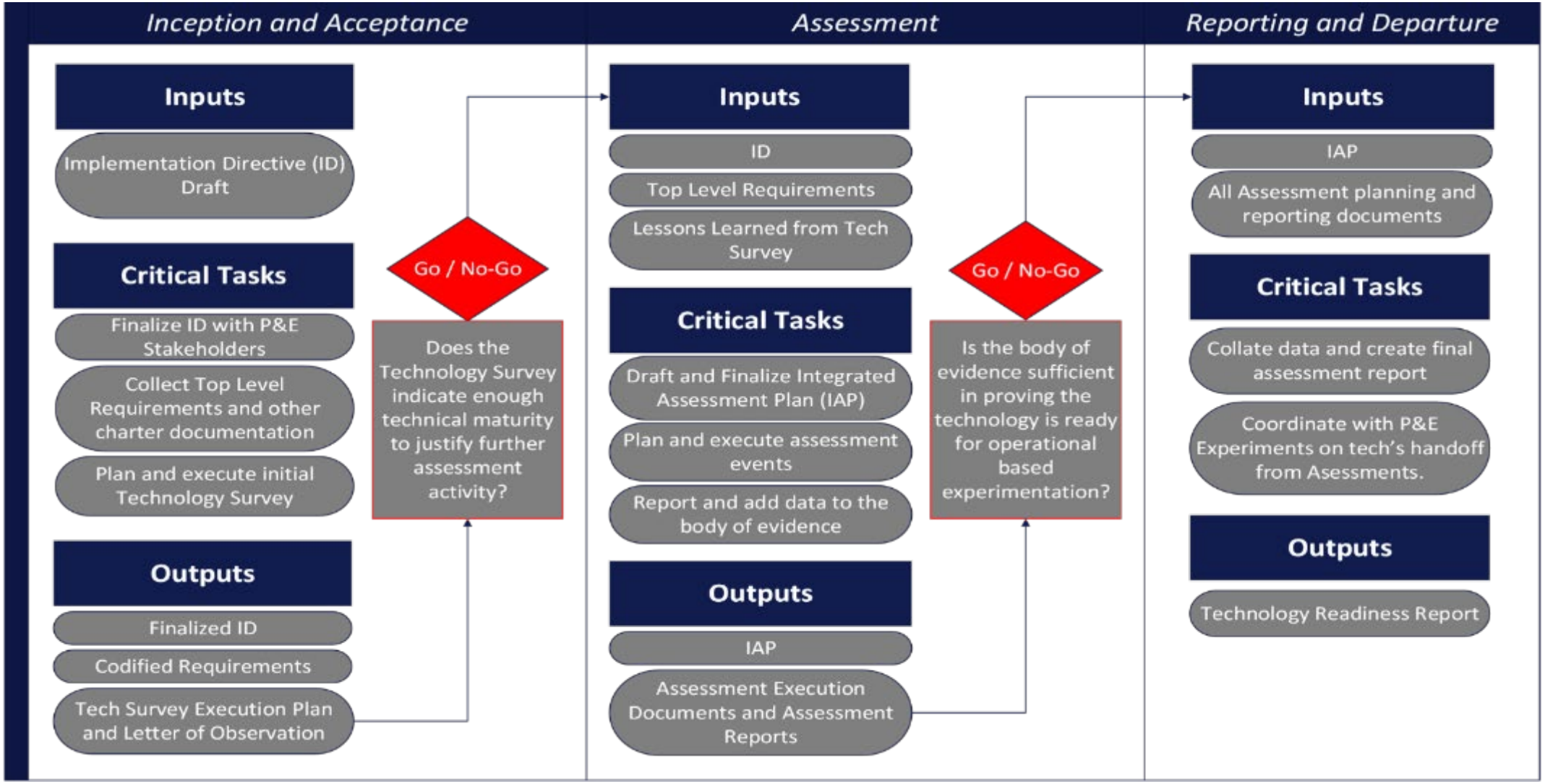
- Third step in the assessment process.
- Focused on demonstrating the technology's ability to function and maintain the baseline established in earlier assessment in a complex, relevant environment.
- Interaction with other assessment elements provided by the government or other participating technologies.
- Should demonstrate multiple technology objectives in a unified event.
- Not as focused on technical rigor, but rather on what can be learned from operating the systems in a relevant environment with representative variables such as compilatory systems or common challenges.
- Serves as the bridge between Technical Demonstrations (TDs) and Operational Demonstrations (ODs)/Operational Assessments (OAs).

Vignette Assessment

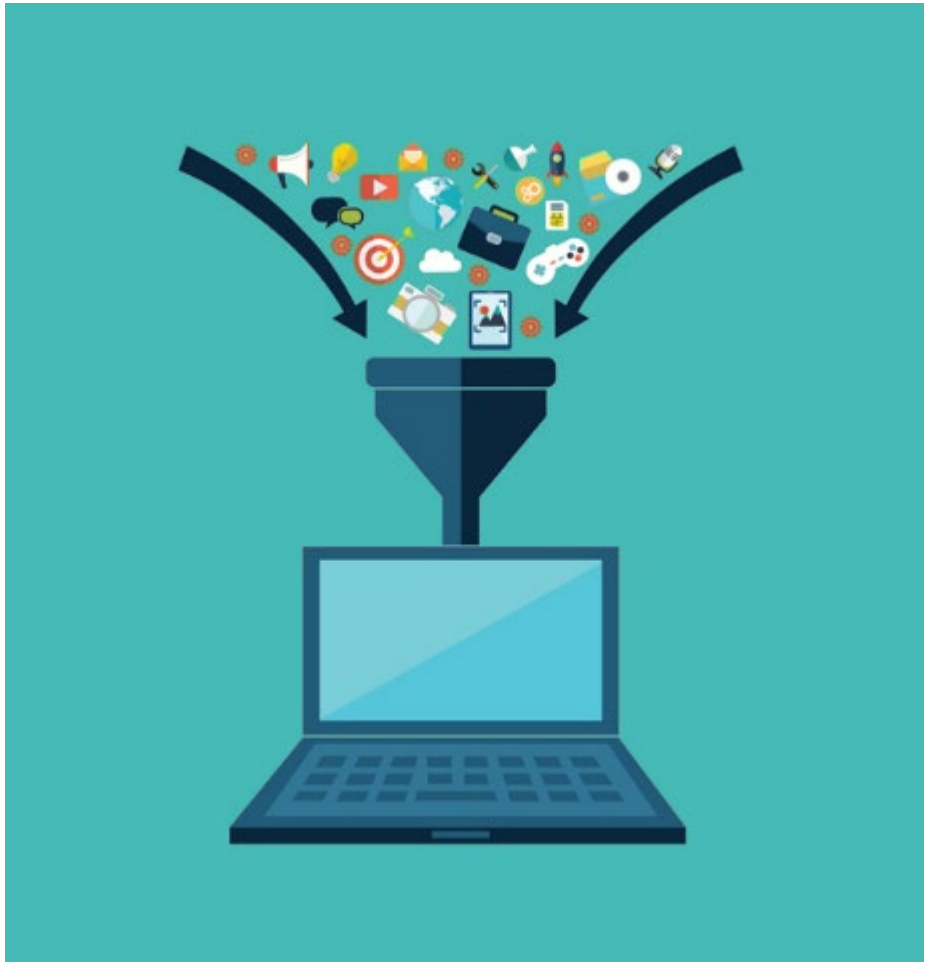
When is a Vignette Assessment performed?

- During a TPE.
- Should comprise a small portion of the event and serve as a capstone in the systems full assessment after the goals of the Baseline and/or Functional Assessments are accomplished.

Conducting as Assessment



Assessment Data



Data Sources

- Primary – Primary data is collected during the assessment from data sources (such as a surveys and interviews) or through observation.
- Secondary – Secondary data is existing data that has been collected for a purpose other than the assessment but is available for use in the assessment (planning, execution, and reporting).

Assessment Data

Data Errors

- Poorly designed assessment surveys and questions.
- Gross Errors – Human oversight and mistakes such as misreading an instrument.
- Random Error – Irregular and unpredictable fluctuations in the experimental and environmental conditions such as changes in temperature.
- Systematic Errors – Environmental (changes in temperature, electromagnetic, frequency, etc.), Observational (such as individual bias or carelessness in observation), and Instrumentational (constraints of data collection devices or misuse of the device) errors.

Assessment Events

Pre-Assessment

- Assessment Planning
  - Draft the IAP and TSEP
- Initial Planning Conference
  - Finalize the TSEP
- Technology Surveys
  - Letter of Observation (LOO)
- Mid-Planning Conference
  - Draft Refine IAP and Draft AED
- Final Planning Conference
  - Refine IAP and Refine AED
- Assessment Readiness Review
  - Go/No Decision

Assessment Events

During Assessment

- STARTEX
- Baseline Assessment
  - Observations and Data Collection
- Functional Assessment
  - Observations and Data Collection
- Vignette Assessment
  - Observation and Data Collection
- DV Day
  - Draft and Present FLB
- ENDEX

Assessment Events

During Assessment

- STARTEX
- Baseline Assessment
  - Observations and Data Collection
- Functional Assessment
  - Observations and Data Collection
- Vignette Assessment
  - Observation and Data Collection
- DV Day
  - Draft and Present FLB
- ENDEX

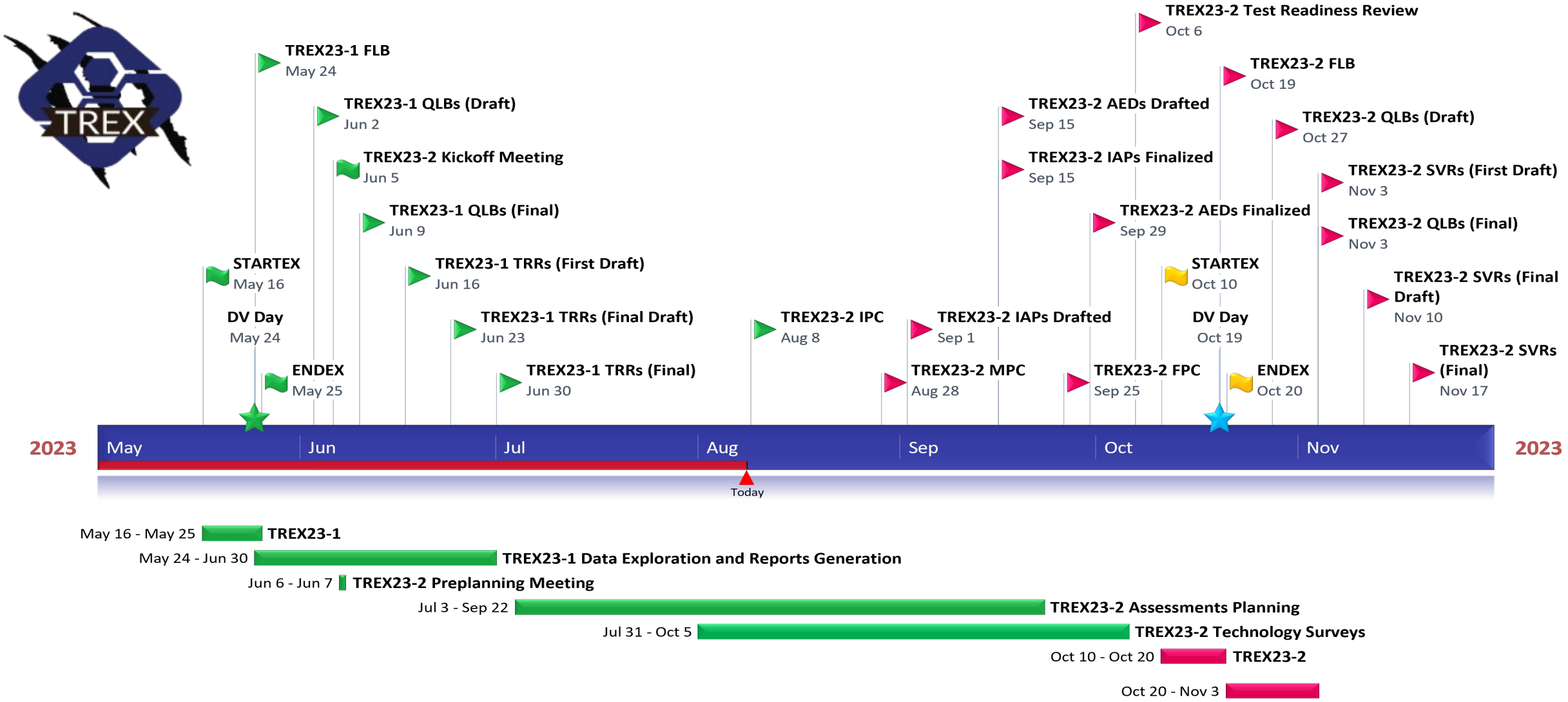
Assessment Events

Post Assessment

- Data Exploration and Reports Generation
  - Draft and Present QLB
  - Draft and Present SVR
  - Collect and Present EXSUMs

Do it Again and Again and Again ! ! !

Assessment Event Exemplar



Demonstration Execution Document

Key Aspects

- The Demonstration Execution Document (DED) provides a detailed plan to execute the demonstration.
- The DED is very similar to the Assessment Execution Document (AED). The DED focuses primarily on the objectives and event details of the demonstration (TD, OD, or OA). The AED focuses primarily on the assessment of the technology.
- The DED identifies the activities that must be completed before, during, and after the demonstration to support the TD, OD, or OA of the participating technologies.
- Portions of the DED will feed sections of the AED (and visa versa).

Demonstration Execution Document

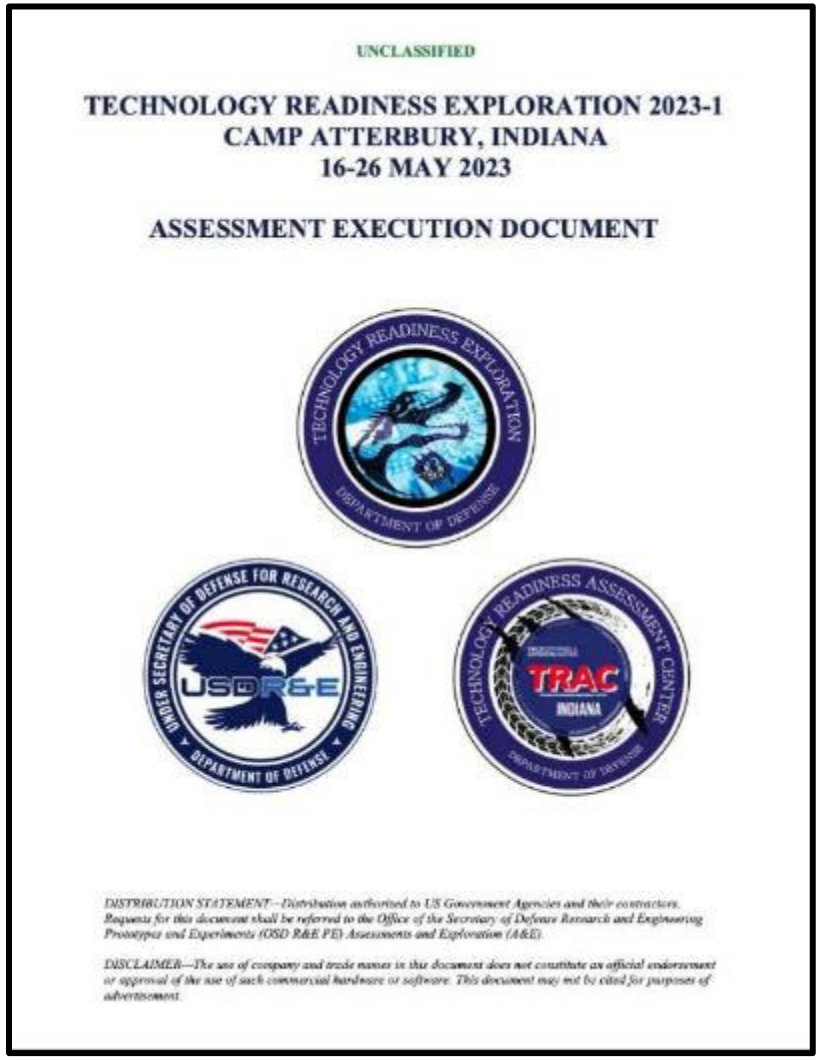
I. Introduction
- A. Background
- B. Purpose and Scope
- C. Participating Technologies
- C. Employment Concepts
- D. Event Objectives
- E. Previous Events
- F. Participating Organizations

II. Execution
- A. Event Overview
- B. Support Requirements
  - Logistics
  - Communications
  - Facilities
  - Equipment
  - Transportation, Lodging, and Messing
  - Security (OPSEC, COMSEC, INFOSEC, etc.)
  - Environmental Protection Plan
  - Roles and Responsibilities

III. Analysis and Reporting
- A. Approach to the Objectives
- B. Reporting

IV. Annexes
- A. Detailed Program Information
- B. Detailed Technology Information
- C. Event Details
  - Scenario
  - Master Scenario Events List
  - Limitations
- D. Field Support Requirements

Body of Evidence – AED



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TECHNOLOGY READINESS EXPLORATION 2023-1
CAMP ATTERBURY, INDIANA
16-26 MAY 2023

ASSESSMENT EXECUTION DOCUMENT

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Assessment Execution Document (AED)

- The AED provides the detailed assessment approach and methodology for the demonstration and assessment of technologies and capabilities.
- The AED provides the data collection and analysis methodology developed by the Assessment Team to determine the technical performance and operational relevance of each technology and capability under assessment during a Vignette Assessment.
- **Note:** Certain assessment efforts may require a companion Demonstration Execution Document (DED).

EXEMPLAR – LSNRS AED

Body of Evidence – AED

Tips for Drafting the AED

- Three basic sections: (1) Introduction, (2) Field Execution, and (3) Analysis and Reporting.
- Strive to keep the main body of the document at about 10-20 pages.
- Include high-level information in the main body. The main body should provide the basic information needed to execute the assessment.
- Use annexes within the document to provide the detailed information. If you choose to, you may use hyperlinks to allow the reader to easily access the detailed information in the annexes when needed.
- Print and distribute the entire document.

Body of Evidence – AED

I. Introduction
- A. Purpose
- B. Background
- C. Operational Problem
- D. Technology Description
- E. Objectives and General Assessment Approach
- F. Participants

II. Execution
- A. Location
- B. Assessment Schedule
- C. Scenario
  - Background
  - Operational Environment
  - Mission

III. Assessment Methodology
- A. Data Sources
- B. Methodology
- C. Analysis of Objectives
- D. Critical Operational Issues
- E. COI 1 (Performance Effectiveness)
- F. COI 2 (Usability)
- G. COI 3 (Mission Impact)
- H. COI 4 (Exportability)
- I. Reporting Plan

IV. Command and Control
- A. Assessment Team Organization

V. Annex A: Data Collection Forms
- A. Appendix A-1: Observation Log
- B. Appendix A-2: Test Incident Report (TIR)
- C. Appendix A-3: Demographics Form
- D. Appendix A-4: Training Survey
- E. Appendix A-5: OD Survey

VI. Annex B: Assessment Activities (Example)
- A. OD Pre-Assessment Activities
- B. OD Event Execution

VII. Annex: Requirements Crosswalk (Example)

Body of Evidence – AED - Annex

I. Introduction
- A. Purpose
- B. Background
- C. Operational Problem
- D. Technology Description
- E. Objectives and General Assessment Approach

II. Execution
- A. Location
- B. Assessment Schedule
- C. Scenario
- D. Scope and Test Design
- E. Limitations

III. Assessment Methodology
- A. Analysis of Objectives
- B. Methodology
- C. Analysis of Objectives
- D. COI 1 (Performance Effectiveness)
- E. COI 2 (Suitability)
- F. COI 3 (Mission Impact)
- G. COI 4 (Exportability)

Learning Outcomes

- ✓ Identify key aspects of conducting an Assessment.
- ✓ Describe the main steps in conducting an Assessment.
- ✓ Identify common data sources and data errors.
- ✓ Identify pre-assessment, during-assessment, and post-assessment events.
- ✓ Describe the key elements of a Demonstration Execution Document (DED).
- ✓ Describe the key elements of an Assessment Execution Document (AED).

Exercise

Draft an AED to support the assessment of:

- Handheld GPS Device (Oregon 550t)
- Mobile GPS Device (Garmin)
- Cell Phone (Samsung S23+)
- Starlink Terminal

Class Schedule

Day One

- 0800 – 0900 The Role of Assessment
- 0900 – 1000 Identifying Assessment Requirements
- 1000 – 1200 Assessment Processes
- 1200 – 1300 Break
- 1300 – 1400 Technology Demonstration
- 1400 – 1500 Operational Demonstration
- 1500 – 1600 Operational Assessment
- 1600 – 1700 Team Building Exercise

Day Two

- 0800 – 1000 Range of Assessments
- 1000 – 1100 Interoperability
- 1100 – 1200 Data Management
- 1200 – 1300 Break
- 1300 – 1500 Assessment Planning
- 1500 – 1700 Assessment Conduct

Day Three

- 0800 – 1000 Assessment Observation and Analysis
- 1000 – 1200 Assessment Reporting
- 1200 – 1300 Break
- 1300 – 1700 Assessment Practical Exercise

Day Four

- 0800 – 1200 Assessment Practical Exercise
- 1200 – 1300 End of Course Wrap Up

Assessment Observation and Analysis

Learning Expectations

- Identify key aspects of analyzing Assessment observation results.
- Identify principles and strategies for data analysis and system assessment.
- Distinguish between T&E and demonstration, observation, and assessment.
- Distinguish between qualitative and quantitative analysis.
- Describe basic statistical concepts and their use in demonstration and assessment.

Assessment Observation and Analysis

Key Aspects

- Assessment observation and analysis is the most important part of the assessment process.

Principles and Strategies

Data Analysis

- Data analysis is the process of systematically applying statistical and/or logical techniques to describe and illustrate, condense, and recap, and evaluate data.
- Data analysis is an ongoing, iterative process where data is continuously collected and analyzed almost simultaneously.

Note: https://ori.hhs.gov/.../datamanagement

Principles and Strategies

Reliability
The consistency of a measure (can the results be reproduced under the same conditions).

VERSUS

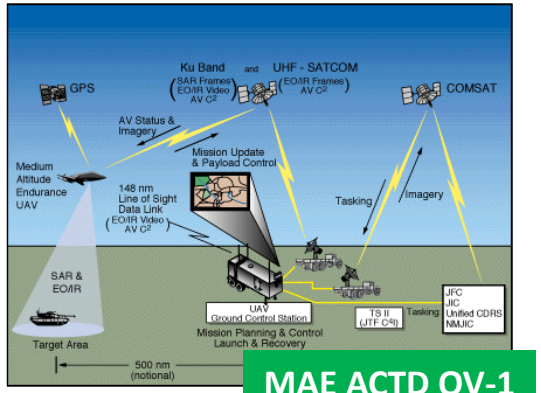
Validity
The accuracy of a measure (do the results really represent what they are supposed to measure).

Note: https://www.scribbr.com/.../reliability-and-validity

Data Analysis considerations and issues include:

- Having the necessary skills to analyze.
- Concurrently selecting data collection methods and appropriate analysis.
- Drawing unbiased inference.
- Inappropriate subgroup analysis.
- Following acceptable norms for disciplines.
- Determining statistical significance.
- Lack of clearly defined and objective outcome measurements.
- Providing honest and accurate analysis.
- Manner of presenting data.
- Environmental/contextual issues.
- Data recording method.
- Partitioning ‘text’ when analyzing qualitative data.
- Training of staff conducting analyses.
- Reliability and Validity.
- Extent of analysis.

Principles and Strategies



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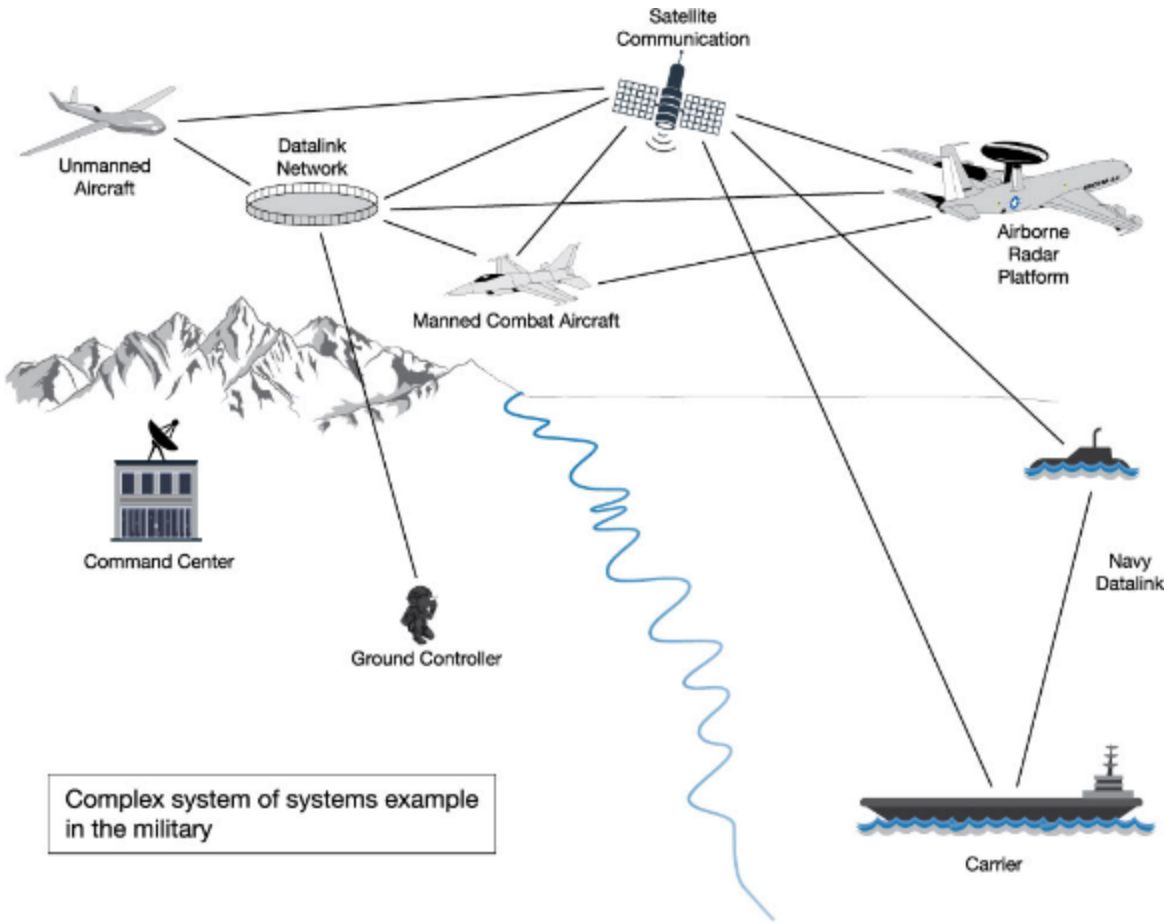
Technical Assessment

- An assessment of a program's technical progress measured against the expected/planned performance for a defined period of time.
- An objective means of identifying, quantifying and monitoring a system's technical risks.
- A rigorous method to help define corrective actions that may be needed to address, and resolve identified technical risks.
- Takes place early in a system's life cycle and continues through operations and support.

Principles and Strategies



Complex system of systems example in the military

System Assessment

- An independent assessment of systems, systems-of-systems, and/or families of systems.
- Determine the Technical progress of a system based on the application of technical indicators such as MOEs, MOPs, KPPs, etc.

Note: https://sdm.mit.edu/the-evolution...defense

Principles and Strategies

Note: https://www.dau.edu/node/179736

Utility Assessment

- An independent assessment of the operational utility of a system.
- Determines the level of operational utility based on the Concept of Operations (CONOPs) and Tactics, Techniques, and Procedures (TTPs).
- Provides post demonstration transition, CONOPs and TTP, and Doctrine, Organization, Training, Material, Leadership and Education, Personnel, Facilities, and Policy (DOTMLPF-P) recommendations.
- Facilitates transition to a program of record (POR), sustainment, or other alternative approaches.
- Facilitates follow-on development efforts.
- Documents applicable shortcomings in the fielded capability.
- Identifies what might be improved in a follow-on effort.

Principles and Strategies

Software Assessment

- Many, if not all, systems now have a software component.
- Software reliability is difficult to determine and generally requires specialized testing beyond the assessment.
- Software testing (diving into the code) is very resource intensive and may not serve the purposes of the assessment.
- Assessors should limit the assessment to usage-based assessment (is the software fit for its intended use?).

Principles and Strategies

Technology Readiness Assessments

- A systematic, metrics-based technical assessment to determine the maturity of, and the risk associated with, critical technologies.
- The examination of program concepts, technology requirements, and demonstrated technology capabilities.
- Technology Readiness Levels (TRLs) are used to estimate the maturity of technologies during the acquisition phase of a program.
- TRLs enable a consistent assessment of technical maturity across different types of technology
- Conducted by an independent team.

T&E versus Assessment

"Testing is a Product"

- Statutory Requirement
- Test
- Evaluate
- Systematic and Objective
- Evaluator and Evaluatee
- Criteria set by the Evaluator
- Requirements and Standards
- Intended and Actual Outcomes
- Measurement is Comparative
- Testing makes Judgements

"Assessment is a Process"

- Customer Driven
- Demonstrate
- Observe
- Methodical and Interactive
- Assessor and Assessee
- Criteria is set by both Parties
- Effectiveness and Performance
- Areas of Improvement
- Measurement is Absolute
- Assessment seeks to Correct Deficiencies

Qualitative versus Quantitative

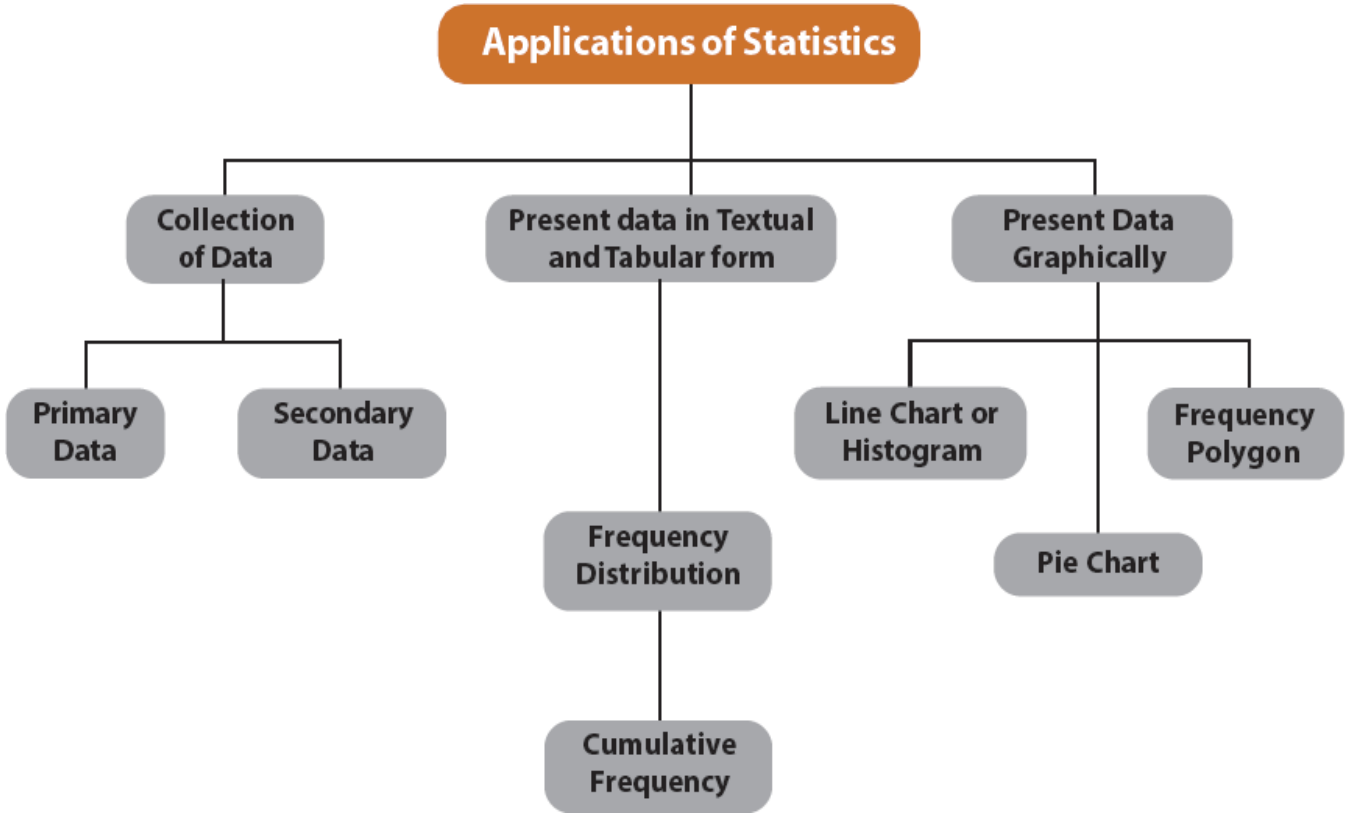
Qualitative Data	Quantitative Data
Descriptive, relating to words and language.	Countable and measurable, relating to numbers.
Describes certain attributes, helps understand the “why” or the “how” behind certain actions.	Determines how many, how much, or how often.
Dynamic and subjective, open to interpretation.	Fixed and universal, “factual.”
Collected through observations and interviews.	Collected by measuring and counting things.
Analyzed by grouping the data into meaningful themes and categories.	Analyzed using statistical analysis.

Statistical Concepts and Application

Concepts

- Statistical methods are essential to test and assessment programs and activities.
- Statistical methods provide a rigorous and objective approach to data analysis.
- Statistical methods identify patterns, trends, and associations between systems, systems of systems, and families of systems.

Statistical Concepts and Application



Applications

- Assessment Planning and Design
- Assessment Analysis and Reporting
- Combining Information from Appropriate Sources
- Experimental Design
- Appropriate Models for the Distribution of Failure Times
- Software Assessment
- Use of Modeling

Note: https://nap.nationalacademies.org/read/6037/chapter/6#52

Statistical Concepts and Application

Assessment Planning and Design

- Define the Purpose of the Assessment – Identify and prioritize measures that are most important so the assessment can be designed to effectively measure them.
- Handling Assessment Factors – Identify and define controllable and influential variables that may impact a system's performance.
- Specifying Assessment Constraints – Identify and understand limitations such as budgets, environmental, participants, and facilities that may constrain the assessment.
- Using Previous Information to Assess Variation – Understand the degree of variation in measures from previous and/or repeated assessments between scenarios (changes in environment, tactics, users, prototypes, etc.).
- Establishing Standardized, Consistent Data Recording Procedures – Assessments, in part, are unscripted activities and required standardized and consistent data recording procedures.
- Using Preliminary Assessments for Assessment Planning and Executing Assessments in Stages – Early and realistic preliminary assessment helps ensure the follow-on assessment(s) will be informative, effective, and efficient.

Statistical Concepts and Application

Assessment Analysis and Reporting

- Reporting Estimates of Uncertainty – All assessment results (based on averages and percentages) should be accompanied with an assessment of their uncertainty. This will alert decision makers to the variability of measurement estimates (the errors) and determine the risks and benefits with continuing in the assessment or acquisition process.
  - Systematic Errors – Errors resulting from measuring devices that are not calibrated against a known, trusted standards.
  - Random Errors – Errors resulting in the fluctuation of measurements of the same quantity about the average and are generally caused by the fineness of scale of a measuring device.

Statistical Concepts and Application

Combining Information from Appropriate Sources

- Information from other assessments, tests, and field use of related systems should be considered for potential use in a combined (and defensible) assessment report if it produces a more comprehensive assessment of a system effectiveness and suitability.
- Assessors need to make use of all available information regarding system performance to make the assessment as effective and efficient as possible.
- Assessors need to be aware of “auxiliary” information (information from tests or assessments of different systems or from different settings or circumstances).

Statistical Concepts and Application

Experimental Design

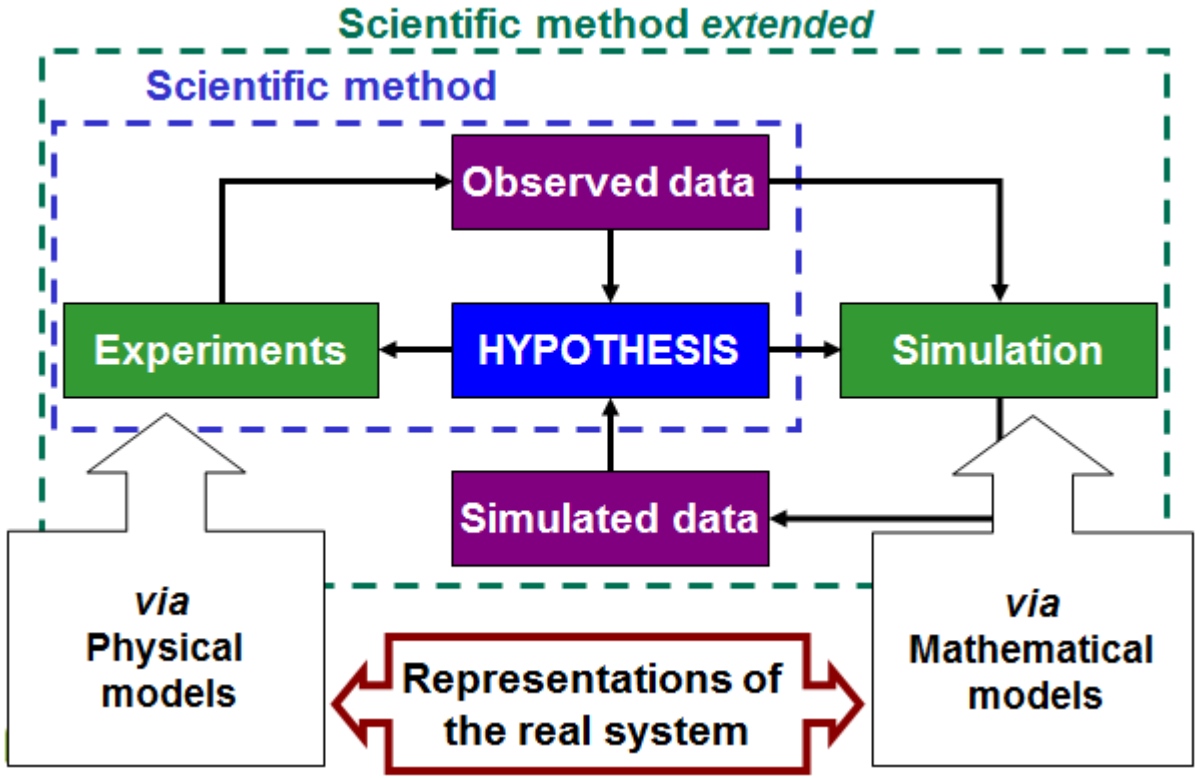
- Assessments must produce results that permit the best decisions to be made with respect to proceeding to the next level of assessment and beyond.
- Two general principles that can be applied to a wide variety of assessment (experimental designs) include:
  - Assess relatively more where variation of what is being measured is greatest.
  - Choose (some) values for assessment factors that are close to the limits of typical use; do not push everything to or beyond the system's limits and capabilities.

Statistical Concepts and Application

Appropriate Models for the Distribution of Failure Times

- The distribution of times to first failure or of times between failures of systems can depend on:
  - The cause of the failure.
  - The age of the system(s).
  - Whether the system had experienced previous failures and then been repaired.
  - The amount of time the system has been in continuous operation.
  - The users (operators).
  - The stress of the environment.
  - The specific prototype used.

Statistical Concepts and Application



Note: https://en.wikipedia.org/wiki/Modeling_and_simulation

Use of Modeling

- Modeling and simulation (M&S) can be used to augment assessment.
- Benefits include, but are not limited to:
  - Decreased cost.
  - Enhanced safety.
  - Avoidance of environmental constraints.
- Model - Test - Model (also referred to as the Scientific Method)

Learning Outcomes

- ✓ Identify key aspects of analyzing Assessment observation results.
- ✓ Identify principles and strategies for data analysis and system assessment.
- ✓ Distinguish between T&E and demonstration, observation, and assessment.
- ✓ Distinguish between qualitative and quantitative analysis.
- ✓ Describe basic statistical concepts and their use in demonstration and assessment.

Exercise

Conduct a Technology Survey of:

- Handheld GPS Device (Oregon 550t)
- Mobile GPS Device (Garmin)
- Cell Phone (Samsung S23+)
- Starlink Terminal

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Assessment Reporting

Assessment Reporting

Key Aspects

- Assessment reporting is the most important part of the assessment process.

Assessment Tools: Creating the Body of Evidence

Assessments uses 3 assessment tools to develop the BoE.

- **Methodology**
  - Methodology turns data into answers by providing a logical framework to analyze data and create a factual argument that a technology satisfies an identified need.
  - Methodology is ultimately housed in a project's Integrated Assessment Plan (IAP).
- **Demonstrations**
  - Demonstrations are run to create the data that is passed through the methodology and pertains to the planning and execution of assessment events that create data.
  - Demonstration planning is housed in some form of Execution Document, whether it is a Technology Survey Execution Plan (TSEP), an Assessment Execution Document (AED), or a Demonstration Execution Plan (DED).
- **Reporting**
  - The manifestation of data generated during demonstrations that is then processed by the methodology and used to communicate the results of assessment efforts to decision makers.
  - Reporting is housed in documents such as a Letter of Observation (LOO), Quick Look Brief (QLB), or System Validation Report (SVR).

Assessment Reports

Key Aspects

- Concise and Clear – The information captures in the Assessment Report should be short, clear, and easy to understand.
- Detailed – The Assessment Report should provide detailed data and information regarding the assessment activities; the information should not be abstract.
- Standard – The Assessment Report should follow a standard template as it is easy for stakeholders to review and understand.
- Specific – The Assessment Report should describe and summarize the assessment result specification and focus on the main point only.
- **If done correctly**, an Assessment Report will provide value to the development lifecycle of a system under assessment by providing the right feedback at the right time to the right stakeholder(s).

Assessment Reports

Key Objectives

- Purpose and Scope – Define the objectives, scope, and limitations of the assessment activities.
- Assessment Summary – Provide an overview of the assessment results.
- Assessment Details – Provide the additional details and observations of the assessment results.
- Assessment Analysis – Provide analysis and interpretation of the assessment results.
- Assessment Conclusion – Provide a summary and recommendation(s) of the assessment results.
- Assessment Presentation – Deliver and communicate the report to the stakeholders.

Assessment Reports

Key Items for the Body of Evidence (BoE)

- Situation Report (SITREP)
- Letter of Observation (LOO)
- First Look Brief (FLB)
- Quick Look Brief (QLB)
- System Validation Report (SVR)
- Executive Summary (EXSUM)

Body of Evidence – SITREP

Dr. Tran,

Good morning (CT).

On 6 May 2023, the OUSD(R&E) P&E Assessments Team observed the second risk reduction flight of the Vanilla Long Endurance Unmanned Aerial Vehicle (LEUAS) integrated with the Tactical Battlefield Airborne Communication Node (TBACN) payload. The purpose of the risk reduction flight was to demonstrate the ability of the integrated Vanilla LEUAS and TBACN capability to operate inflight. The following is a summary (the who, what, where, when, and why) of that event.

1. Who

The following Assessments Team personnel observed the risk reduction event.

- Dr. Mike Tran, PhD
- Dr. Larry Solliday, DM
- Tim Solliday

The following Platform Aerospace personnel supported the risk reduction event.

- Dr. Dan Edwards, PhD
- Jonathan "JT" Rasche

The following TribalCo personnel supported the risk reduction event.

- Jason Sapp

The following NEANY personnel supported the risk reduction event.

- Steven Steptoe
- Mike Austin

2. What

The second risk reduction flight of the Vanilla LEUAS integrated with the TBACN payload.

3. Where

Webster Airfield

17682 Grayson Rd
St Inigoes, MD 20684

4. When

6 May 2023.

5. Why

The event sought to demonstrate the ability of integrated Vanilla LEUAS and TBACN capability to operate in inflight.

After a short operations and safety brief by the Platform Aerospace Team, the ground checks for each system began. Both the Vanilla LEUAS and the TBACN payload passed their ground checks. The TBACN payload was then configured for takeoff. The Vanilla LEUAS started its engine, taxied to the runway, and proceeded to conduct high speed aborts to configure the climb angle of the prop for air density.

Next, the Vanilla LEUAS proceeded with their takeoff procedures and was cleared for takeoff taking flight at 1002 ET. After takeoff, the Vanilla LEUAS went through a functional test list consisting of a pattern entry, invert orbit, and a simulated landing. The functional check was performed due to the installation of a new engine into the Vanilla LEUAS platform.

Next, the Vanilla LEUAS transitioned to the St. Mary's Buoy at 2,000ft MSL and verified the TBACN payload was on and functioning. The Tribalco team then proceeded to test all four waveforms. The Trellis Ware (20 watts), Silvus (10 watts), and electronic warfare (EW) waveforms functioned normally. The Assessments Team did observe intermediate comms lost with all three waveforms. The Link 16 radios on the ground were able to communicate while the combined Vanilla LEUAS and TBACN capability was in line of sight (LoS), however, they were unable to communicate to and from the Link 16 radio in the TBACN payload.

Next, the Vanilla LEUAS proceeded to climbed to 7,000ft MSL at 4.5 miles out. A second test on the TBACN waveforms were performed. Both the Trellis Ware and the EW waveforms were functioning. Both the Silvis and Link 16 radio on TBACN had no comms.

At 1111 ET, the Vanilla LEUAS began its climb to its service ceiling. At 1246 ET, the Vanilla LEUAS reached its service ceiling of 13,560ft MSL. A third test of the waveforms

Click Document to View

on the TBACN payload was conducted with the Trellis Ware and EW waveforms function intermittently. Both the Silvis and Link 16 remained out of comms.

Next, the Vanilla LUEAS tested max distance at 900 MHZ. At 1305 ET, the Vanilla LEUAS at 10,000ft MSL and 17 miles out lost comms. All four waveforms on the TBACN payload also lost comms. The Vanilla LEUAS standard operating procedures (SOP) were implemented to bring it back into communication. At 1325 ET, comms was reestablished with the Vanilla LEUAS. At 1327 ET, comms returned to the Trellis Ware and EW waveforms intermittently. Both the Silvus and link 16 radio remained out of comms.

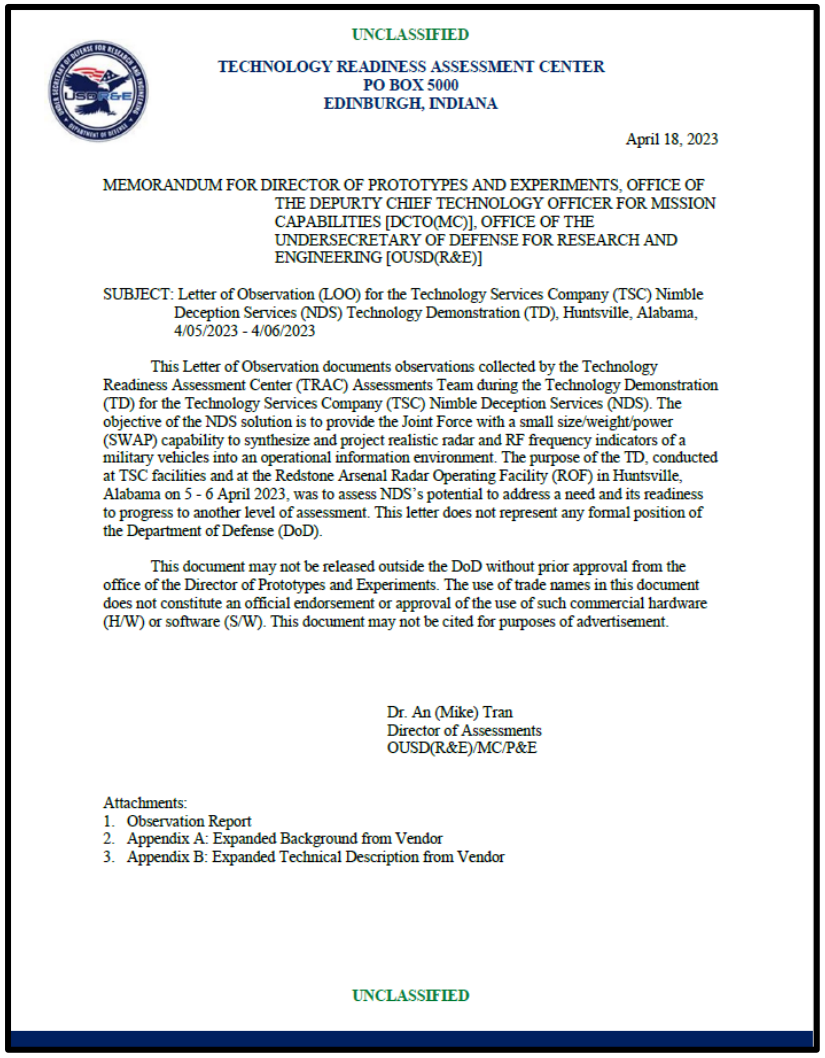
Next, the Vanilla LEUAS proceeded to descend to 6,000ft MSL overhead to conduct a dash speed run. At 1357 ET, the Vanilla LEUAS started its dash speed run and reached 70kt at 1359 ET.

Next, then Vanilla LEUAS returned to St. Mary's buoy at 5,00ft MSL at 1400 ET and configured the Vanilla LEUAS and TBACN payload for landing and executed the landing.

Finally, once the Vanilla LEUAS landed a check of the Link 16 radio identified the radio had been recycled enough times to "factory" reset the system. This appears to be the cause of the communications issue from the aircraft. Upon further investigation, with the technical assistance of the Marine Corps team, it was determined the battery pack installed on the Vanilla LEUAS (a universal battery pack) failed to maintain a "locked" connection with the radio and caused the reset. The combined Platform Aerospace, Tribalco, and Marine Corps team was able to replicate the failure loss multiple times and concluded modifications to the mounting bracket for the Link 16 within the Vanilla LEAU would need to be modified to create a more secure mounting point. It is worth noting, before departing Webster Field the Marine Corps team conducted multiple tests to ensure the Link 16 radios were functioning and confirmed they were operational.

Please let us know if you have any questions regarding this SITREP. The team that observed the risk reduction flight is on the CC line. They are standing by to answer any questions you may have or provide further details related to the site visit. Attached are a few pictures from the event.

Body of Evidence – LOO



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TECHNOLOGY READINESS ASSESSMENT CENTER
PO BOX 5000
EDINBURGH, INDIANA

April 18, 2023

MEMORANDUM FOR DIRECTOR OF PROTOTYPES AND EXPERIMENTS, OFFICE OF THE DEPURTY CHIEF TECHNOLOGY OFFICER FOR MISSION CAPABILITIES [DCTO(MC)], OFFICE OF THE UNDERSECRETARY OF DEFENSE FOR RESEARCH AND ENGINEERING [OUSD(R&E)]

SUBJECT: Letter of Observation (LOO) for the Technology Services Company (TSC) Nimble Deception Services (NDS) Technology Demonstration (TD), Huntsville, Alabama, 4/05/2023 - 4/06/2023

This Letter of Observation documents observations collected by the Technology Readiness Assessment Center (TRAC) Assessments Team during the Technology Demonstration (TD) for the Technology Services Company (TSC) Nimble Deception Services (NDS). The objective of the NDS solution is to provide the Joint Force with a small size/weight/power (SWAP) capability to synthesize and project realistic radar and RF frequency indicators of a military vehicles into an operational information environment. The purpose of the TD, conducted at TSC facilities and at the Redstone Arsenal Radar Operating Facility (ROF) in Huntsville, Alabama on 5 - 6 April 2023, was to assess NDS's potential to address a need and its readiness to progress to another level of assessment. This letter does not represent any formal position of the Department of Defense (DoD).

This document may not be released outside the DoD without prior approval from the office of the Director of Prototypes and Experiments. The use of trade names in this document does not constitute an official endorsement or approval of the use of such commercial hardware (H/W) or software (S/W). This document may not be cited for purposes of advertisement.

Dr. An (Mike) Tran
Director of Assessments
OUSD(R&E)/MC/P&E

Attachments:
1. Observation Report
2. Appendix A: Expanded Background from Vendor
3. Appendix B: Expanded Technical Description from Vendor

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Letter of Observation (LOO)

- The LOO presents the observations from the demonstration and assessment technologies and capabilities.
- The LOO is the primary report from the Technology Survey.

Body of Evidence – LOO

I. Cover Letter

II. Observation Report

A. Purpose

B. Background

C. Technology Description

D. Summary of Observations

E. Execution of Observation Event

- Location
- Schedule

F. Capabilities Observed

III. Summary and Recommendations

Body of Evidence – FLB

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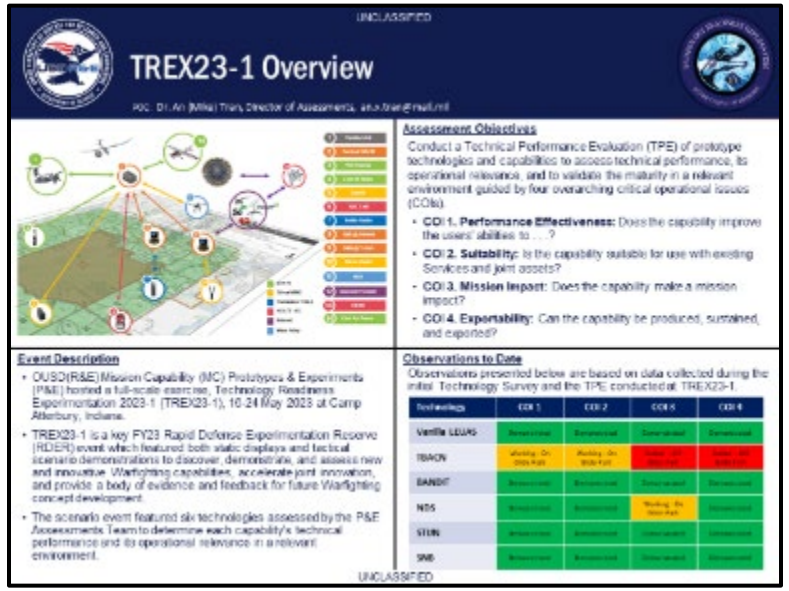
First Look Brief (FLB)

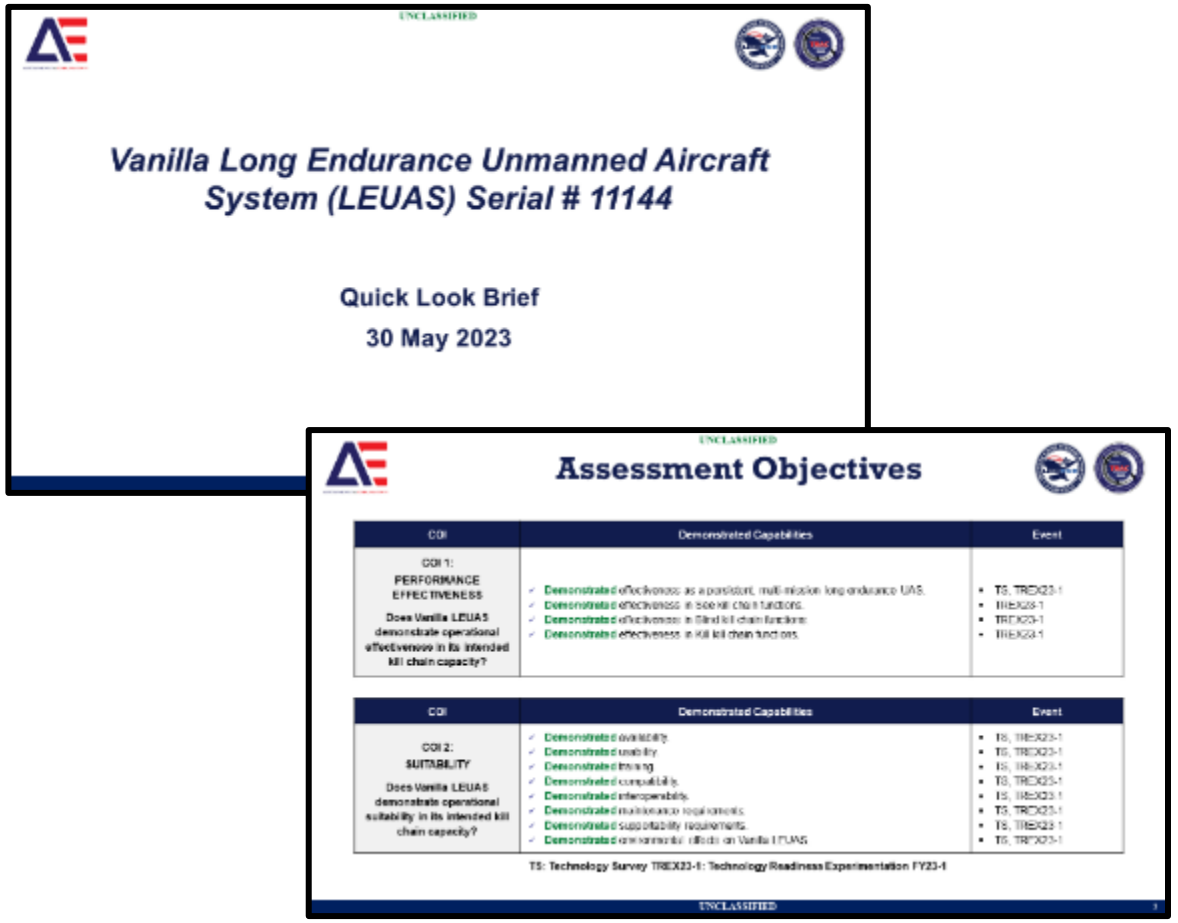
- The FLB presents a summary (a snapshot) of the emerging assessment outcomes from the demonstration and assessment of technologies and capabilities and is presented on the final day (the DV Day) of a demonstration.
- **Note:** The FLB generally proceeds the Quick Look Brief (QLB).

Body of Evidence – FLB



- **Cover Page (Slide)**
  - Title
  - Date
  - POCs
  - Distribution Statement
- **Event Quad Chart**
  - OV-1
  - Event Description
  - Assessment Objectives
  - Observations to Date
- **Technology Quad Charts**
  - Picture(s)
  - Technology Description
  - Assessment Objectives
  - Observations to Date
  - Summary

Body of Evidence – QLB



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Quick Look Brief (QLB)

- The QLB presents a summary (a snapshot) of the initial assessment outcomes from the demonstration and assessment of technologies and capabilities.
- The QLB can be updated during the drafting of the System Validation Report (SVR) to reflect the final assessment outcomes and serve as a summary of the SVR.
- **Note:** The QLB can also be proceeded by a First Look Brief (FLB) that is presented on the final day (the DV Day) of a demonstration.

Body of Evidence – QLB

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Vanilla Long Endurance Unmanned Aircraft System (LEUAS) Serial # 11144

Quick Look Brief

30 May 2023

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Executive Summary

Assessment Objectives

Conduct a Technical Performance Evaluation (TPE) of Vanilla LEUAS to determine its technical performance, its operational relevance, and to validate its maturity in a relevant environment.

- COI 1. **Performance Effectiveness:** Does Vanilla LEUAS provide the capability to conduct persistent multi-mission capabilities?
- COI 2. **Suitability:** Is Vanilla LEUAS operationally suitable for persistent mission capabilities?
- COI 3. **Mission Impact:** Does Vanilla LEUAS positively impact persistent multi-mission capabilities?
- COI 4. **Reportability:** Can Vanilla LEUAS be produced, sustained, and operated?

Technology Description

- The Vanilla Long Endurance Unmanned Aircraft System (LEUAS) is a Group 2 unmanned aircraft with unmatched unrefueled endurance at tactical altitudes.
- Vanilla LEUAS uses a high-efficiency, heavy-fuel engine running widely available JetA or JP-8 fuel.
- The aerodynamics are sailplane-inspired for high cruise efficiency, despite the relatively small 80-foot wingspan.
- The monocoque carbon-fiber composite airframe construction is rugged for flight in the turbulence of level altitudes and for normal autonomous landings on an improved runway.
- Vanilla LEUAS takes off from a launcher in the bed of a pickup truck.
- The Ground Control (GC) controls track testing and runway access like any other manned aircraft and the truck is controlled like a ground vehicle after the aircraft lifts off.

Observations to Date

- COI 1: **Performance Effectiveness**
  - Vanilla LEUAS SUCCESSFULLY DEMONSTRATED 4 out of 4 COI 1 Objectives.
- COI 2: **Suitability**
  - Vanilla LEUAS SUCCESSFULLY DEMONSTRATED 7 out of 7 COI 2 Objectives.
- COI 3: **Mission Impact**
  - Vanilla LEUAS SUCCESSFULLY DEMONSTRATED 2 out of 2 COI 3 Objectives.
- COI 4: **Reportability**
  - Vanilla LEUAS SUCCESSFULLY DEMONSTRATED 2 out of 2 COI 4 Objectives.

Summary

Vanilla LEUAS successfully demonstrated technical performance and its operational relevance and is ready to advance to the next level of assessment.

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Assessment Objectives

COI	Demonstrated Capabilities	Event
COI 1: PERFORMANCE EFFECTIVENESS Does Vanilla LEUAS demonstrate operational effectiveness in its intended kill chain capacity?	✓ Demonstrated effectiveness as a persistent, multi-mission long endurance UAS ✓ Demonstrated effectiveness in Sense kill chain functions ✓ Demonstrated effectiveness in Strike kill chain functions ✓ Demonstrated effectiveness in Kill kill chain functions	• TR: TRE323-1 • TR: TRE323-1 • TRE323-1 • TRE323-1

COI	Demonstrated Capabilities	Event
COI 2: SUITABILITY Does Vanilla LEUAS demonstrate operational suitability in its intended kill chain capacity?	✓ Demonstrated availability ✓ Demonstrated reliability ✓ Demonstrated training ✓ Demonstrated compatibility ✓ Demonstrated interoperability ✓ Demonstrated maintenance requirements ✓ Demonstrated supportability requirements ✓ Demonstrated environmental effects on Vanilla LEUAS	• TR: TRE323-1 • TR: TRE323-1 • TR: TRE323-1 • TR: TRE323-1 • TR: TRE323-1 • TR: TRE323-1 • TR: TRE323-1 • TR: TRE323-1

TR: Technology Survey TRE323-1: Technology Readiness Experimentation FY23-1

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Preliminary Observations

COI 1. PERFORMANCE EFFECTIVENESS

Does Vanilla LEUAS demonstrate operational effectiveness in its intended kill chain capacity?

- Vanilla LEUAS **SUCCESSFULLY DEMONSTRATED** 4 out of 4 COI 1 Objectives.
- Brief discussion supporting successful demonstration of objectives.

COI 2. SUITABILITY

Does Vanilla LEUAS demonstrate operational suitability in its intended kill chain capacity?

- Vanilla LEUAS **SUCCESSFULLY DEMONSTRATED** 7 out of 7 COI 2 Objectives.
- Brief discussion supporting successful demonstration of objectives.

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Issues Observed

- List/Discuss issue.
- List/Discuss issue.
- List/Discuss issue.
- List/Discuss issue.

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Path Forward

- Preliminary observations suggest Vanilla LEUAS demonstrated technical performance and its operational relevance and is ready to advance to the next level of assessment.
- Complete data analysis.
- Deliver the Technology Readiness Report (TRR) on 26 May 2023.
- Continue coordination with the Long Endurance UAS Portfolio Manager and Experimentation Team to support the Operational Assessment (OA) of Vanilla LEUAS in an operational relevant environment.

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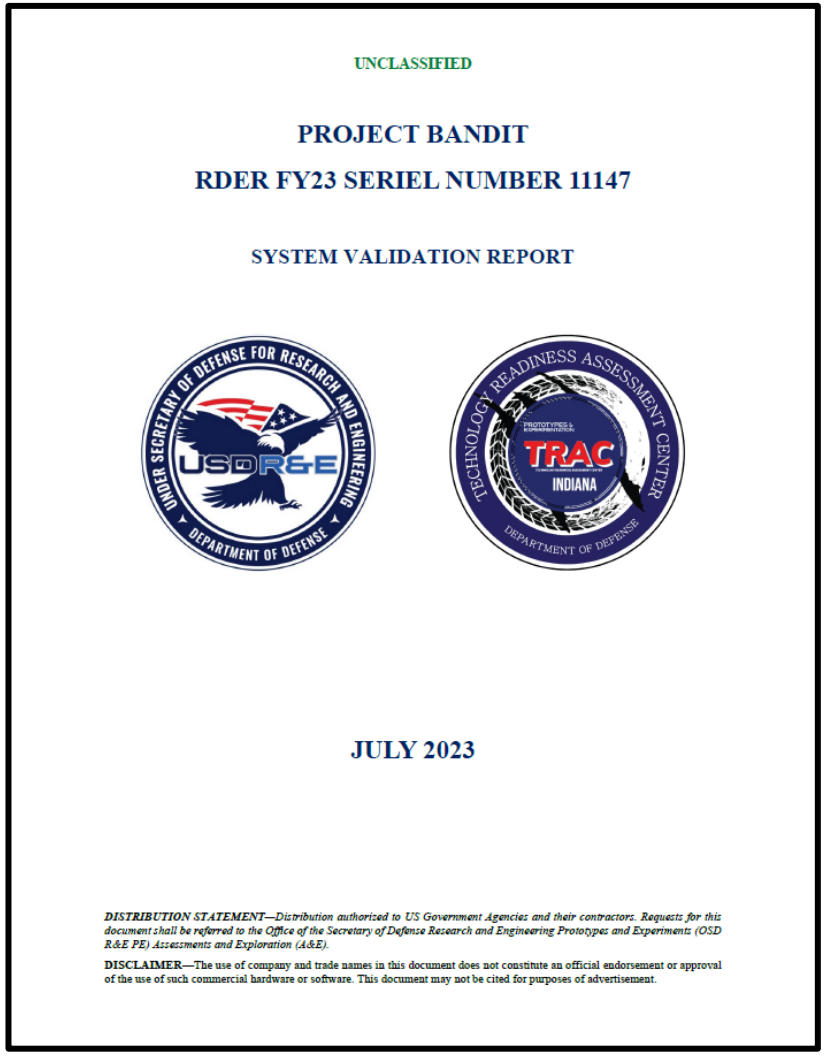
Body of Evidence – SVR



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PROJECT BANDIT

RDER FY23 SERIEL NUMBER 11147

SYSTEM VALIDATION REPORT

JULY 2023

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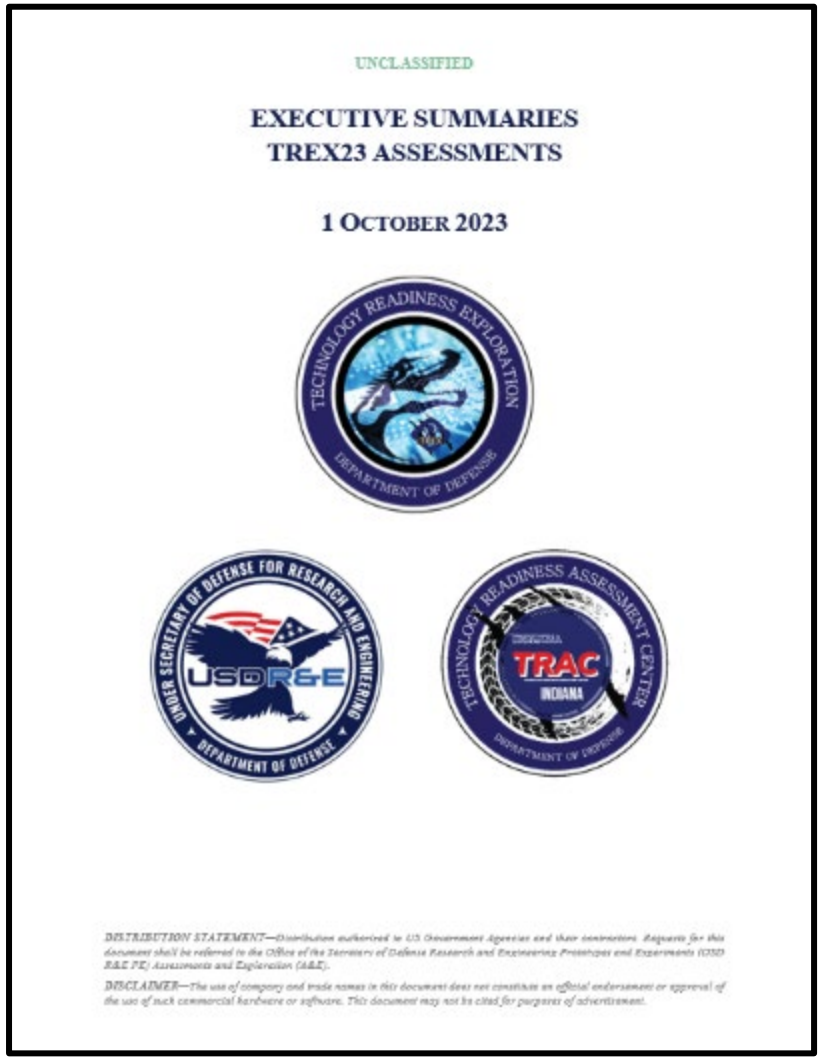
System Validation Report (SVR)

- The SVR presents the conclusions and recommendations from the demonstration and assessment of technologies and capabilities.
- The SVR presents a summary of all the assessment activities, methods used for assessment, and a summary of the assessment results to date.
- **Note:** The SVR can present the conclusions and recommendations for a demonstration event (such as T-REX23-2) or can focus solely on all the demonstration and assessment activities for a specific technology or capability to date.

Body of Evidence – SVR

Body of Evidence – EXSUM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EXECUTIVE SUMMARIES
TREX23 ASSESSMENTS

1 OCTOBER 2023

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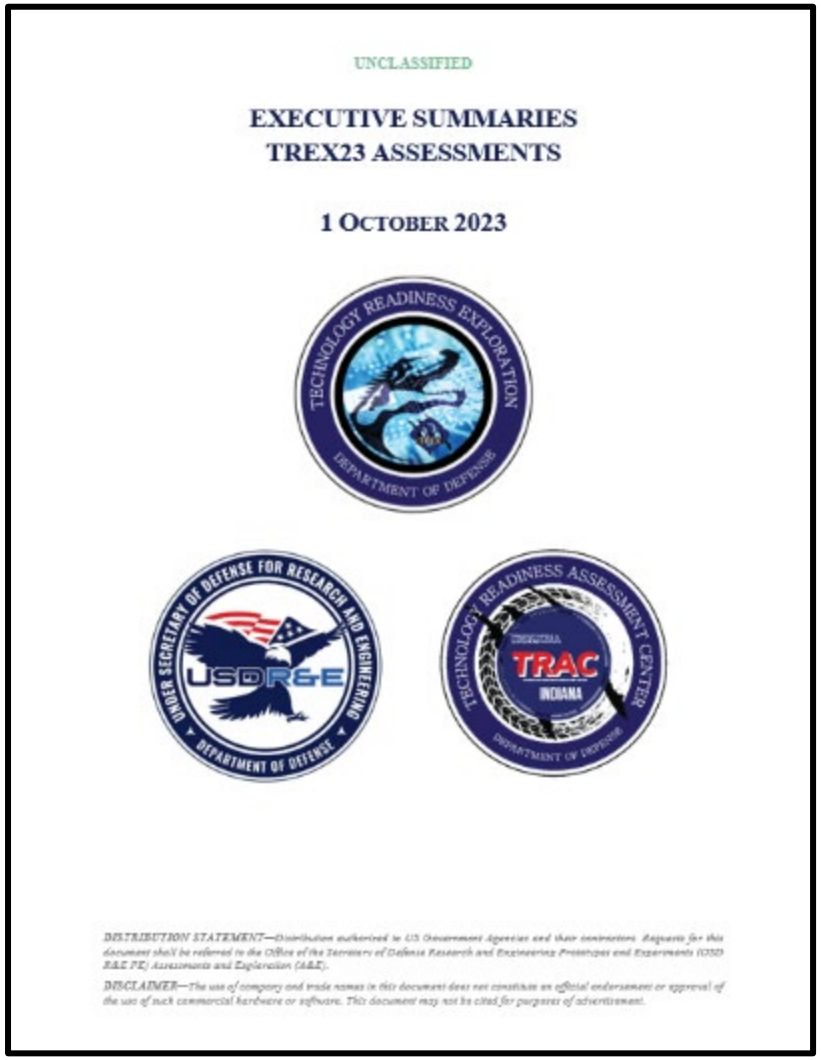
Executive Summary (EXSUM)

- The EXSUM summarizes the technology or capability, the potential of the technology or capability, the assessment conducted, the critical operational issues (COIs) assessed, the outcomes of the assessment, and the recommendations going forward.
- Commonly referred to as the “Reader’s Digestion” version of the IAP, AED, and SVR.
- **Note:** The EXSUM can summarize the outcomes and recommendations of a demonstration event (such as T-REX23-2) or can focus solely on a specific technology or capability.

Body of Evidence – EXSUM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EXECUTIVE SUMMARIES
TREX23 ASSESSMENTS

1 OCTOBER 2023

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- Commonly referred to as the “Reader’s Digestion” version of the IAP, AED, and SVR.
- **Note:** The EXSUM can summarize the outcomes and recommendations of a demonstration event (such as T-REX23-2) or can focus solely on a specific technology or capability.

Body of Evidence – EXSUM

EXECUTIVE SUMMARY

The BlueShield – SIPR - NIPR in a BOX (SNB) demonstrated technical performance and operational relevance by providing seamless, interoperable communications (voice and data) across disparate military and commercial communication networks (e.g., SATCOM, radios, cellular, and IP-based networks). SNB features a modular design and open architecture enabling tailorable solutions to meet mission needs. It fuses heterogeneous soldier, combat net, and multiband tactical radio communication technologies into a fully integrated mesh network regardless of communications spectrum, waveform, or protocol. The SNB capability, when integrated into a deployed communications architecture, provides secure strategic and tactical communications directly supporting Joint All-Domain Operations (JADO).

The Office of the Under Secretary of Defense (OUSD) Research and Engineering (R&E) Prototypes and Experiments (P&E) [OUSD(R&E)/P&E] Assessments Team observed Technical Demonstrations (TDs) of the United States Central Command (USCENTCOM) sponsored SNB capability. The first TD event was a Technology Survey conducted on 2-3 March 2023 at the TribalCo facility in Tallapoosa, GA. The second TD event involved a Technical Performance Evaluation (TPE) conducted during the Technology Readiness Exercise (T-REX) FY23-1 at Camp Atterbury, Edinburgh, Indiana, 16-24 May 2023. Observations from the TDs were based on four Critical Operational Issues (COIs). During the TDs, SNB successfully demonstrated each COI. A synopsis of SNB's technical and mission assessment by COI is captured in Table 1on the following page.

Based on observations and the evidence collected and presented in this report, it is reasonable to assign the SNB capability a minimum Technology Readiness Level (TRL) of 6. SNB is recommended for further experimentation by OUSD(R&E)/P&E in future utility assessment events and/or appropriate joint military exercises. This could include, but not be limited to, a situationally and operationally relevant Operational Demonstration (OD) and/or Operational Assessment (OA) to develop concept of operations (CONOPS) for how the SNB capability could be incorporated into fielding.

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Table 1: SNB T-REX 23-1 Assessment Results

COI	Assessment Stoplight	Assessment Summary
COI 1 (Functional & Performance Attributes) Does SNB provide seamless communication across disparate military and commercial communications networks in its intended Kill Chain capacity?	🟢	• SNB successfully demonstrated seamless classified and unclassified communications across six disparate technologies including: Silvus, TrellisWare, Link-16, Starlink SATCOM, Wi-Fi, and Commercial Cellular (LTE). • Target track information and representative airborne sensor video were successfully exchanged between forward deployed elements and decision makers.
COI 2 (Usability & Deployment Complexity): Is SNB suitable for use with existing service and joint assets in providing seamless interoperable secure communications?	🟢	• SNB can be implemented in multiple deployment form factors depending on mission application ranging from larger Command Post units to man portable units. • As a measure of expeditionary value, SNB was tailored to establish a classified node on the Marine Corps FMF Grid.
COI 3 (Security & Mission System Interoperability): Does SNB have a positive mission impact in providing seamless, interoperable secure communications?	🟢	• SNB successfully demonstrated the integration of the STUN transport layer application to provide secure covert data exfiltration over commercially open SATCOM. • SIPR VTCs successfully conducted between edge node Private Access Cell user and actively deployed forward mission asset (USS BATAAN) through SNB.
COI 4 (Maintainability & Expandability): Can SNB be maintained and adapted to the mission environment needs?	🟢	• SNB is the integration of currently deployed hardware and software familiar to operational users and maintainers. • Troubleshooting system operation issues and system faults in the field require no additional specific SNB knowledge, skills, or abilities.
Key	🟢	***Likely to Meet Standards; Significant Improvement Over Current Capability***
	🟡	***Unlikely to Meet Standards; Not a Significant Shortfall; Marginal Improvement over Current Capability***
	🔴	***Unlikely to Meet Standards; Significant Shortfall; Not an Improvement Over Current Capability***
	⚪	***Inconclusive or Not Tested***

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Learning Outcomes

- ✓ Identify key aspects of reporting assessment results.
- ✓ Recognize the objectives of an Assessment Report.
- ✓ Identify the key items which should be included in an Assessment Report.
- ✓ Describe the key elements of a SITREP.
- ✓ Describe the key elements of a Letter of Observation (LOO).
- ✓ Describe the key elements of a First Look Brief (FLB).
- ✓ Describe the key elements of a Quick Look Brief (QLB).
- ✓ Describe the key elements of a System Validation Report (SVR).
- ✓ Describe the key elements of an Executive Summary (EXSUM).

Exercise

Draft a SITREP and LOO from the Technology Survey of:

- Handheld GPS Device (Oregon 550t)
- Mobile GPS Device (Garmin)
- Cell Phone (Samsung S23+)
- Starlink Terminal

Class Schedule

Day One

- 0800 – 0900 The Role of Assessment
- 0900 – 1000 Identifying Assessment Requirements
- 1000 – 1200 Assessment Processes
- 1200 – 1300 Break
- 1300 – 1400 Technology Demonstration
- 1400 – 1500 Operational Demonstration
- 1500 – 1600 Operational Assessment
- 1600 – 1700 Team Building Exercise

Day Two

- 0800 – 1000 Range of Assessments
- 1000 – 1100 Interoperability
- 1100 – 1200 Data Management
- 1200 – 1300 Break
- 1300 – 1500 Assessment Planning
- 1500 – 1700 Assessment Conduct

Day Three

- 0800 – 1000 Assessment Observation and Analysis
- 1000 – 1200 Assessment Reporting
- 1200 – 1300 Break
- 1300 – 1700 Assessment Practical Exercise

Day Four

- 0800 – 1200 Assessment Practical Exercise
- 1200 – 1300 End of Course Wrap Up

ASMT 101.U14

Assessment Practical Exercise

Learning Expectations

- Demonstrate a practical understanding of assessment planning, conduct, observation and analysis, and reporting methods and processes.

Assessment Practical Exercise

Conduct a Technical Capabilities Test (TCT), to include drafting an IAP, FLB/QLB and SVR of:

- Handheld GPS Device (Oregon 550t)
- Mobile GPS Device (Garmin)
- Cell Phone (Samsung S23+)
- Starlink Terminal

Learning Outcomes

- ✓ Demonstrate a practical understanding of assessment planning, conduct, observation and analysis, and reporting methods and processes.

Summary

Learning Outcomes

- ✓ Identify demonstration and assessment requirements.
- ✓ Identify steps and major activities in the demonstration and assessment process.
- ✓ Identify key aspects of data management in demonstration and assessment.
- ✓ Identify key aspects of demonstration and assessment planning and assessment conduct.
- ✓ Identify key aspects of analyzing and assessing assessment results.

Questions

Dr. Larry Solliday, DM
President
lawrence.m.solliday.ctr@mail.mil
larry.solliday@t2linc.com
812-675-7739

Backup Slides