

## A shifting focus for T&E

ITEA International Panel  
2013-11-15  
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Swedish Defense Materiel Administration (FMV)



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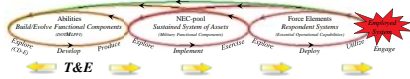
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## A shifting focus for T&E

The role and focus is shifting from T&E in the acquisition process to full life-cycle support



DOTMLPFI - Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facilities, Interoperability (DOTMLPFI)  
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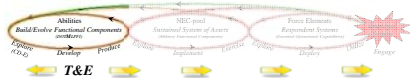
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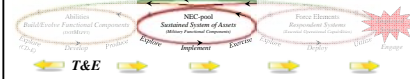
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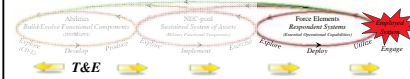
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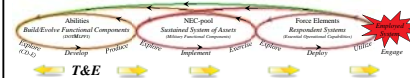
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## A shifting focus for T&E

The role and focus is shifting from T&E in the acquisition process to full life-cycle support



### Implications/Challenges

- Multiple, Broken, Asynchronous Life-cycles
- Multiple Stake Holders/Organizational Domains of Interest, Military & Civilian
- Holistic System Hierarchy, from Component to SoS and Federation of Systems (FoS)
- Functional Components and Capabilities with non Material Solutions - DOTMLPFI
- Shortcuts - Rapid Acquisition and Fielding

Same approach for providing T&E Capabilities?

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### So what does this mean?

It's still primarily about providing efficient and effective ways to gain knowledge and reduce uncertainties in decisions and trade-offs

But ...

- It becomes increasingly more important to support **Exploration** (for what and in what context can it be used)
- There is an increased need and opportunities for Collaborative Cross-domain (CD-E, Test, Training, etc.) **Pooling and Sharing of Resources** (hence reducing costs and enhancing capability)
- **Complexity and Resources** needed to provide realistic SoS/PoS Scenarios stress the need to **Co-operate in Cross-domain Exercises and Events**
- In this new context with multiple organizations, multiple broken asynchronous lifecycles, it becomes crucial with a **Standardized Approach for Focusing and Evaluating T&E** as well as a **Common Architecture Framework to Capture and Transfer T&E Information**

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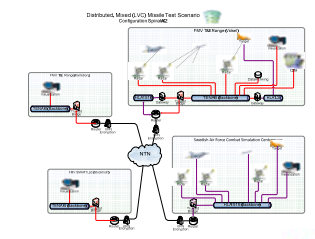
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Pooling and Sharing Resources

### Example



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### Support Exploration

**Verification** (Has it been built right?)

- The process of providing evidence justifying the system's correctness and completeness according to its specification

**Validation** (Have we built the right thing?)

- The process of providing evidence justifying the system's utility in a predefined context according to the user needs

**Exploration** (What can it do?)

- The process of providing evidence demonstrating the system's utility in a conceptual, exploratory or operational mission context

The methods and techniques for providing evidence when observing a system (i.e. test, simulation, analogy, use, audit, SME) are similar for all three (Verification, Validation and Exploration)

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### Architecture Framework for T&E Information

In a context with multiple organizations and multiple broken asynchronous lifecycles, it becomes crucial with a standardized approach for focusing and evaluating T&E as well as a common architecture framework to capture and transfer T&E information

**Goals**

- Provide an efficient and effective way to generate relevant/efficient/useful/reliable/low T&E information that support well-informed decisions and tradeoffs through our system life cycles
- Foster common understanding and promote information sharing/use

**Context**

- Component level to SoS/PoS
- Functional Components (DOTML/PP) and Capabilities
- Military and Civilian Components
- Developed, MOTS, GO TS and CO TS Systems (white grey/black box)
- Support transition between multiple organizations
- Support modular/composable/holistic system decomposition
- Support asynchronous broken development cycles
- Independent of development doctrine (e.g. waterfall, spiral, etc.)

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### Pooling and Sharing

**National Test, Training and Experimentation Network (NTN)**

- Persistent Connectivity (NTN)
  - Common Cross-domain Infrastructure
  - Standardized Information Exchange (TEWA, H-A, DIS, DCS, LHM6, ...)
  - Bridged to Coalition/Partner Networks
  - Continuously supporting Multinational, Cross-Domain and Comprehensive Approach Exercises

**Net Enabled T&E Capabilities**

- Implementing a Distributed Information Exchange Architecture (EDIW) on FMV T&E Ranges
- Utilize Distributed LVC Resources (similar cross-domain needs for an immersive LVC environment)

**Provides**

- A persistent capability for Pooling and Sharing distributed facilities, enabling T&E endeavors to more efficiently be developed, deployed and executed
- Opportunities to Co-operate in Cross-domain Exercises and Events
- Realistic Contexts for T&E

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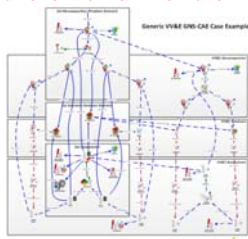
### Architecture Framework for T&E Information

**Approach**

- Re-use concepts from the Safety and M&S Domains
- Decision Centric
- Argumentation based
- Goal Network Structure for breaking down System and T&E Requirements
- Claim-Argument Evidence Structure for composing T&E and System results

**Features**

- Scalable
- Tailorable
- Risk driven
- Provide Traceability
- Provide Transparency
- Provide Reproducibility



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## Summary



- *T&E support during Capability Engineering*
- *Pooling & Sharing – Sovereignty versus Efficiency and Effectiveness*
- *It's all about Useful, Timely Information*
- *This shifting focus for T&E gives great opportunities for collaboration*

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## Questions and Comments?

*(hakan.lagerstrom@fmv.se)*

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