Test and Evaluation WIPT

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Analysis – Synthesis Model

Mission

Tasks (UJTLs)

Interactions

Actions

Components

Technology

Test via

Operational Test

Force Development/Experimentation

Interoperability testing

Subsystem Test

Component Testing

Technology Demonstration
Mission-Task decomposition provides the test planner with a powerful tool to design the best test plan possible. It stems from user validated scenarios, missions and tasks --providing the framework for evaluating demonstrated FCS system and SoS capabilities.

**Missions**

- **to accomplish**
- comprise

**Tasks**

- **to perform**

**Capabilities**

- enabled by
- as supplied by

**Materiel**

- provides

**Answers the “So What?” Question**

* Doctrine, Organization, Training, **Materiel**, Leadership and Education, Personnel, Facilities
9 Step Evaluation Methodology

1. Mission-Task Decomposition
2. Critical Task Selection
3. Performance Capabilities for Critical Tasks
4. Capabilities to Evaluation Focus Areas
5. Capabilities to FCS Sub-Systems
6. FCS Sub-System Performance
7. Degraded States of FCS Sub-System Performance
8. Aggregation to ESS
9. Model-Test -Model
What does the Operational & Organizational (O&O) Plan and Operational Requirements Document (ORD) really mean with respect to enabling accomplishment of the Unit of Action Missions and how the materiel will be fought?

**Step 1**
- Mission-Task Decomposition
- Critical Task Selection

**Step 2**
- Operational Test
- Force Development/Experimention
- Interoperability Testing
- Component Testing
- Subsystem Test
- Technology Components
- Technology Demonstration

**Combined Arms Battalion (CAB)**
- Phase 1-CAB2 attacks to secure Objective Camel
- Phase 2-CAB2 ...
- Phase 3-CAB2 ...

**Command and Control**
Army Tactical Task (ART) 7.0

**Manage Tactical Information ART 7.2**
- Collect Relevant Information ART 7.2.1
- Process Relevant Information to Create COP ART 7.2.2
- Display COP Tailored to User Needs ART 7.2.3

**Intelligence ART 1.0**
- Collect Intelligence ART 1.2

**Step 1: Mission-Task Decomposition**
**Step 2: Critical Task Selection**
### Tasks Identified For Mission Mapped To O&O Capabilities

(What must be done in a test to enable evaluation of capabilities?)

**Step 3: Performance Capabilities for Critical Tasks**

<table>
<thead>
<tr>
<th>AUTL Ref #</th>
<th>O&amp;O Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>F12: Enable dissemination of tactical scheme</td>
<td>x x x x / / x x</td>
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<tr>
<td>F15: Enable continuous situational understanding through networked force</td>
<td>/ / / / x x x x</td>
</tr>
<tr>
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<td>x x x / / / /</td>
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<td>F17: Enable information exchange via adaptive, integrated communications</td>
<td>/ / / / / / /</td>
</tr>
<tr>
<td>F18: Detect/prevent intruders/malicious software; identify points of intrusion/origin, information compromised/introduced into the network</td>
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<tr>
<td>F19: Enable Continuous Situational Awareness (FCS)</td>
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<tr>
<td>F20: Enable information management to fuse, monitor and disseminate information to support CCR, combat action, decision-making and analysis</td>
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</tr>
<tr>
<td>F21: Establish an adaptive learning repository to build and manage a library of friendly and enemy DTLMS and lessons learned</td>
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<tr>
<td>F22: Enable terrain analysis</td>
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<tr>
<td>F23: Integrate synergistic use of ISR to see the full range of operational variables</td>
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</tbody>
</table>

Red with an X = Direct enabler of intent of task
Yellow with a / = Enables performing task to standard
### Step 4: Functional Capabilities to Evaluation Focus Areas

#### C4ISR

<table>
<thead>
<tr>
<th>Lethality</th>
<th>C4ISR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F1:</strong> Capability to destroy enemy formations via LOS, BLOS and/or NLOS</td>
<td><strong>F8:</strong> Support mission planning/mission rehearsal</td>
</tr>
<tr>
<td><strong>F2:</strong> Organizationally employ fire delivery</td>
<td><strong>F9:</strong> enable battle command and control</td>
</tr>
<tr>
<td><strong>F3:</strong> Scale effects to focus precisely</td>
<td><strong>F10:</strong> Enable continuous estimate of situation</td>
</tr>
<tr>
<td><strong>F4:</strong> Employ minefields</td>
<td><strong>F11:</strong> Enable visualization of tactical scheme</td>
</tr>
<tr>
<td><strong>F5:</strong> Maximize lethality of dismounted</td>
<td><strong>F12:</strong> Enable dissemination of tactical scheme</td>
</tr>
<tr>
<td><strong>F6:</strong> “Avenge” kill enemy systems engaging or preparing to engage friendly systems</td>
<td><strong>F13:</strong> Detect presence/identify disposition of anti-tank/personnel mines, booby traps</td>
</tr>
<tr>
<td><strong>F7:</strong> Air defense (AD) lethality</td>
<td><strong>F14:</strong> Detect, locate other non-mine/booby trap, man-made obstacles</td>
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<td><strong>F8:</strong> Provide improved early warning and dissemination of threats</td>
<td><strong>F15:</strong> Enable continuous situational understanding through networked force</td>
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<td><strong>F9:</strong> Enable battle command and control</td>
<td><strong>F16:</strong> Facilitate automatic language translation</td>
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<td><strong>F23:</strong> Integrate synergistic use of ISR to see the full range of operational variables</td>
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<td><strong>F17:</strong> Enable information exchange via adaptive integrated communications</td>
<td><strong>F24:</strong> Provide combat identification to detect, locate and identify friend, for and noncombatants and systems</td>
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<td><strong>F18:</strong> Detect/prevent intruders/malicious software; identify points of intrusion</td>
<td><strong>F25:</strong> Determine what is most dangerous</td>
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<td><strong>F19:</strong> Enable POSNAV</td>
<td><strong>F26:</strong> Enable command and control needed to synchronize fire, maneuver and ISR</td>
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<td><strong>F20:</strong> Enable information management to fuse, monitor and disseminate information to support CCIR, combat action, decision-making and analysis</td>
<td><strong>F27:</strong> Enable sensor to shooter linkage</td>
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<td><strong>F21:</strong> Establish an adaptive learning repository to build and manage a library of friendly and enemy DTLOMS and lessons learned</td>
<td><strong>F28:</strong> Provide improved early warning and dissemination of threats</td>
</tr>
</tbody>
</table>

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*Step 4: Capabilities to Evaluation Focus Areas*
### Step 4: Functional Capabilities to Evaluation Focus Areas (cont.)

#### Mobility
- F29: Maneuver into and out of contact
- F30: Enable decisive maneuver
- F31: Enable development of situation out of contact
- F32: Provide for tactical mobility
- F33: Counter/neutralize/clear/mark anti-tank/personnel mines, booby traps
- F34: Breach disrupting/fixing obstacles
- F35: Cross gaps (i.e. streams, irrigation ditches)
- F52: Conduct air assault operations

#### Survivability
- F36: Enable protective countermobility and survivability support
- F37: Enhance individual soldier survivability
- F38: Degrade enemy detection and terminal targeting
- F39: Defeat/intercept enemy threats
- F40: Enable blinding the enemy
- F41: Provide area suppression capability

#### Sustainability
- F43: Enable medical treatment and evacuation of wounded soldiers
- F44: Enable reduction in the maneuver sustainment footprint and demand for replenishment
- F45: Enable organic Unit of Action sustainment
- F46: Simplified systems maintainability to reduce maintenance and replenishment burden
- F47: Water generation and replenishment
- F48: Provide capability to monitor, report and submit requests to facilitate anticipatory sustainment
- F49: Provide a means of transporting people and materiel
- F50: Dismounted forces must be self-sustaining

#### MANPRINT
- F42: Facilitate improved soldier performance
- F51: Provide a multi-echelon training construct

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*Step 4: Capabilities to Evaluation Focus Areas*
# O&O Capabilities Mapped to Materiel via ORD & PCDs

(What materiel will be assessed to evaluate capability of interest?)

## Step 5: Capabilities to FCS Sub-Systems

### Capabilities provides

#### as supplied by

<table>
<thead>
<tr>
<th>O&amp;O Capability</th>
<th>ORD Ref. #</th>
<th>SoS Spec. Citation</th>
<th>Procurement Control Drawings (PCD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F23: Integrate synergistic use of ISR to see the full range of operational variables</td>
<td>3160</td>
<td>3.2.1.2.1.8; 3.7.23.2.1.14</td>
<td>786-300146, Situation Understanding (SU) SSS; 786-300151</td>
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<tr>
<td></td>
<td>2392</td>
<td>3.2.1.2.1.3; 10.2.1.2.3.1</td>
<td>786-300151</td>
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<tr>
<td>F24: Provide combat identification to detect, locate, and identify friend, foe and noncombatants and systems</td>
<td>2850</td>
<td>3.2.1.2.3.4.2; 3.7.23.2.1.2.18; 3.7.23.2.1.18.1; 3.7.23.2.1.2.5; 3.2.1.2.3.4.5; 3.2.1.2.3.4.3; 3.2.1.2.3.4.1; 3.2.1.2.3.4.4</td>
<td>786-30022, Armed Robotic Vehicle (ARV); 786-30082, Combat ID System; 786-300146, Situation Understanding (SU) SSS; 786-300151</td>
</tr>
<tr>
<td>F25: Determine what is most dangerous</td>
<td>1215</td>
<td>3.2.1.4.4</td>
<td>786-300144, C2 Battle Command &amp; Mission Execution SSS; 786-300145, C2 Planning &amp; Preparation SSS; 786-300151</td>
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<td></td>
<td>3407</td>
<td>3.7.4.2.1.4.1; 3.7.4.2.1.4.2</td>
<td>786-30001, MCS; 786-300145, C2 Planning &amp; Preparation SSS; 786-300146, Situation Understanding (SU) SSS</td>
</tr>
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<td>F26: Enable command and control needed to synchronize fire, maneuver and ISR</td>
<td>1061</td>
<td>3.2.1.2.3.5; 3.2.1.8.15.1.1; 3.2.1.8.15.1.2; 3.2.1.8.15.1.2.2; 3.7.23.2.1.2.8.5; 3.7.23.2.1.7.1; 3.7.23.2.1.7.2</td>
<td>786-300144, C2 Battle Command &amp; Mission Execution SSS; 786-300145, C2 Planning &amp; Preparation SSS; 786-300146, Situation Understanding (SU) SSS; 786-300149, Warfighter Machine Interface (WMI), 786-300151</td>
</tr>
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<td>F27: Enable sensor to shooter linkage</td>
<td>2406</td>
<td>3.2.1.2.3.2</td>
<td>786-30090, Sensor Data Management; 786-30091; 786-30092, C4ISR Level 1 Sensor Fusion; 786-300144, C2 Battle Command &amp; Mission Execution SSS; 786-300145, C2 Planning &amp; Preparation SSS; 786-300146, Situation Understanding (SU) SSS; 786-300151</td>
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Mission-Task decomposition provides the test planner with a powerful tool to design the best test plan possible. It stems from user validated scenarios, missions and tasks – providing the framework for evaluating demonstrated FCS system and SoS capabilities.

**Step 7:** Degraded States of FCS Sub-System Performance

* Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities
UA Missions in OT
Sample Task Set Applied OT Model

1.3.3.1 Conduct Zone Recon

MTP 34-5-0041 Conduct UAV Flight Operations
MTP 34-5-0052 CGS Mission Activities
ART 7.2.1 Collect Relevant Information
ART 7.2.2 Process Relevant Information to create COP
ART 7.2.5 Disseminate COP & Execution Information

ART 7.2.1 Collect Relevant Information
ART 7.2.3 Display COP Tailored to User Needs

ART 3.3.1.1 Conduct Surface to Surface Atk
ART 7.2.3 Display COP Tailored to User Needs
ART 7.2.1 Collect Relevant Information

MTP 34-5-0041 Conduct UAV Flight Operations

ART 2.4.1 Conduct Lethal Direct Fire Against a Surface Target
ART 7.2.3 Display COP Tailored to User Needs
ART 7.2.1 Collect Relevant Information

XX-XX Conduct Autonomous Surveillance

8.5.1 Attack By Fire an Enemy Force /Position

ART 8.1.2 Conduct an Attack
Conclusions

• Understanding User’s Intent and Operational Concept informs Evaluator and enables construction of doctrinally valid and viable test events to assess FCS capabilities in meeting Operational Effectiveness, Suitability, Survivability

• Mission to Means Framework is clearly understand and promoted by the Program Manager and is being implemented

• Framework was demonstrated and approved by Senior Army and PEO leadership at T&E Summits III and IV