A Method to Analyze Network-Centric Capabilities for Agile C2 for Force Sustainment Soldiers in Southwest Asia

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Purpose and Agenda

To describe a study commissioned by the U.S. Army to determine what network-enabled capabilities would improve deployed Sustainment operations

- Background
- Study objectives, tasks, and scope
- Methodology to identify and prioritize gaps with potential solutions
  - FAA
  - FNA
  - FSA
- Recommendations
The Defense Acquisition Management System 2008

JCIDS: Joint Capabilities Integration and Development System
COCOM: Combatant Command
CDD: Capabilities Development Document
MDD: Material Development Decision
ICD: Initial Capabilities Document
CPD: Capabilities Production Document
WHAT ARE WE TRYING TO ACCOMPLISH AND HOW DO WE MEASURE IT?

EXISTING GUIDANCE

1. MILITARY OBJECTIVES
2. CONOPS
3. EFFECTS
4. TASKS OR FUNCTIONS
5. ATTRIBUTES
6. MEASURES

HOW GOOD ARE WE AT DOING IT WITH TODAY’S PROGRAMMED FORCES?

GAPS IN ACHIEVING MILITARY OBJECTIVES

WHAT SHOULD WE DO ABOUT IT?

POTENTIAL APPROACHES TO SOLVING CAPABILITIES GAPS

(FSA)

(FNA)

(FAA)

Considers Entire DOTMLPF

DOTMLPF: Doctrine, Organization, Training, Material Leadership & Education, Personnel, Facilities
Problem Background

Investment in info-structure: BFT, FCS, JTRS . . . for Combat Arms Soldiers!
What about these guys?
Constraints, Limitations, and Assumptions

• **Constraints:**
  – Address current force MTOEs to 2010.
  – Focus on Sustainment and Headquarters Soldiers in and around fixed sites; only examine Transportation Soldiers.

• **Limitations:**
  – High OPTEMPO, low density population led to small sample sizes for some questionnaires and interviews.
  – Data fidelity enabled prioritization of net-centric capability gaps into two tiers.
  – Solution fidelity enabled high-level assessment.

• **Assumptions:**
  – Responses from highly experienced Transportation Soldiers enabled the study team to draw reasonable conclusions.
  – Net-centric capability gaps categorized into two tiers is sufficient for sponsor use.
  – For solution attributes, applying rough orders of magnitude estimates provided sufficient measure to assess solutions.
Objective: Identify network-enabled capability gaps for Transportation Soldiers and potential solutions to those gaps.

**Study Methodology**

**Functional Area Analysis**
- **Transportation & Net-Centric Doctrine, Joint Concepts**
- **SME Input:**
  - TCS Evaluation.
  - Net-Centric Capabilities as Related to Transportation Tasks.
- **FAA Product:**
  - Transportation TCS impacted by Net-Centric Capabilities.

**Functional Needs Analysis**
- **SME Input:**
  - Gap Identification
  - Risk
- **Logistics Battle Command Simulation**
- **FNA Product:**
  - Prioritized Lists of Transportation Task Gaps and Tiered Net-Centric Gaps.

**Functional Solutions Analysis**
- **SME Input:**
  - Identify Solutions
  - Assemble Packages
  - Analyze Packages
- **Logistics Battle Command Simulation**
- **FSA Product:**
  - Recommended Solutions to Mitigate Gaps.

Legend:  □ Input  □ Output  □ Process

SME: Subject Matter Expert
TCS: Tasks, Conditions, Standards
June 2009
NET-CENTRICITY AND FORCE SUSTAINMENT

Soldiers

FAA Methodology

**Issue:** What individual Transportation Soldier tasks require network-enabled capabilities?

- **Transportation & Net-Centric Doctrine, Joint Concepts**
- **Identify NCOE required capabilities.**
- **SME Participation In Interviews and Questionnaire**

**Research applicable strategic concepts & capabilities to determine appropriate set of Transportation TCS.**

- **Map individual Transportation tasks to Battalion METL, AUTL, and UJTL tasks.**
- **195 TCS supporting Transportation mode, terminal, movement control functions.**
- **SMEs evaluate:**
  - Tasks impacted by net-centric capabilities.
  - TCS for validation.

**Qualitative analysis on questionnaire and interview results.**

**FAA product:** Validated list of 124 TCS impacted by net-centric capabilities.

- **Legend:** □ Input □ Output □ Process

*AUTL: Army Universal Task List*  
*METL: Mission Essential Task List*  
*NCOE: Net-centric Operating Environment*  
*UJTL: Universal Joint Task List*  
*TCS: Task, Conditions, Standards*
**Net-centricity and Force Sustainment Soldiers**

June 2009

### FAA Results

- **3 Transportation capabilities**
  - Mode Operations
  - Terminal Operations
  - Movement Control

- **10 Net-centric capabilities**

- **124 Individual tasks with corresponding standards that are impacted by net-centric capabilities**
  - Motor Transport Operator
  - Cargo Specialist
  - Transportation Management Coordinator
FNA Methodology

Issue: What network-enabled capability gaps exist and what is their priority?

FAA Output: Validated list of 124 TCS impacted by net-centric capabilities.

SME Participation
In Interviews and Questionnaires

SMEs identify tasks with net-centric capability gaps.

SMEs characterize gaps.

SMEs conduct operational risk assessment for each gap WRT likelihood and impact.

Rank order task gaps within each net-centric capability gap based on risk assessment.

Prioritize net-centric capability gaps into tiers based on risk assessment and SME input.

Preliminary product: Prioritized lists of transportation task gaps and tiered net-centric gaps

Preliminary product: Refined gap descriptions and gap prioritization.

Legend:  □ Input  □ Output  □ Process

Council of Colonels

CRSP: Centralized Receiving and Shipping Point
Net-centricity and Force Sustainment Soldiers
**FNA End State Example**

### Net-Centric Capability Gap

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1.</td>
<td>Collaborate</td>
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<td>2.</td>
<td>Continuous KSA</td>
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<td>3.</td>
<td>Create and Produce Information</td>
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<td>4.</td>
<td>Decisions and Planning</td>
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<td>5.</td>
<td>Relationships</td>
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<td>6.</td>
<td>Situational Understanding</td>
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<td>7.</td>
<td>Basis of Issue</td>
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<td>8.</td>
<td>Exchange Information</td>
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<td>9.</td>
<td>Interoperability</td>
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<td>10.</td>
<td>Network Infrastructure</td>
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<td>11.</td>
<td>Process Data</td>
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Legend:  □ Tier 1  □ Tier 2

### Transportation Task Gap

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1.</td>
<td>Communicate with Subordinates in Marshalling Yard.</td>
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<td>2.</td>
<td>Process Unit for Unit Move.</td>
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<td>3.</td>
<td>Perform Operational Control of Port Support Activity.</td>
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<td>4.</td>
<td>Manage Contractors.</td>
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<tr>
<td>5.</td>
<td>Plan Onward Movement of Personnel and Cargo.</td>
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</tbody>
</table>

43. Coordinate, Process, and Arrange Onward Movement of Frustrated Cargo.  
44. Provide Cargo Documentation Support for the Import/Export of Unit Equipment and Supplies.

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**FNA Output:** 44 Transportation task gaps aligned with 11 net-centric capability gaps (in two tiers), provides input to the FSA.
FSA Methodology

Issue: What DOTMLPF Solutions Mitigate Transportation Soldier Net-Centric Capability Gaps?

1. Idea Generation
   - Identify & Characterize DOTMLPF Solutions
     - Workshops
     - Focus Groups
     - Interviews
   - SME Input
     - Signal Center
     - CASCOM
     - PMs (JTRS, EIS-TIS)

2. Create IAPs
   - 31 Solutions to mitigate 44 Transportation task gaps
   - Morphological Analysis
     - G1 G2 ... G44
     - S1 C
     - S2 M M
     - ... 
     - S31 C C
   - 336 IAPs
     - Gap Coverage
     - Cost

3. Assess IAPs
   - PMJ
   - Rules
   - IAP1 C C C
   - IAP2 C M+ M
   - ... 
   - IAP 336 M+ C C C

4. Analysis of IAPs
   - IAPs scored on:
     - Gap Coverage
     - Cost
     - Schedule
     - Feasibility
     - Supportability
     - Technical Risk
     - Operational Risk
   - Multi-Attribute Decision Making
   - Statistical Analysis

5. Output
   - Prioritized Lists of Integrated Approach Packages.

Legend:
- IAPs: Integrated Approach Packages
- Net-centricity and Force Sustainment Soldiers
Analysis of IAPs
336 IAPs

Low cost IAPs:
• Insufficient coverage to tier 1 gaps,
• Very little coverage to tier 2 gaps,
• Not considered viable.

Recommended IAPs:
• Provided best gap coverage:
  • Coverage to all tier 1 gaps,
  • Coverage to most tier 2 gaps,
  • Included few high cost solutions.

Highest cost IAPs:
• Some tier 1 gaps uncovered,
• Included solutions that only mitigate one gap,
• Included multiple high cost solutions.

IAPs: Integrated Approach Packages
**Recommendation to the Sponsor**

Recommend implementing one of the four bolded IAPs. They are leading candidates regardless of weighting scheme.

<table>
<thead>
<tr>
<th>‘Gap coverage’ weighted most</th>
<th>‘Cost’ weighted most</th>
<th>‘Schedule’ weighted most</th>
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<tbody>
<tr>
<td><strong>IAPs</strong></td>
<td><strong>IAPs</strong></td>
<td><strong>IAPs</strong></td>
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<td>A-20</td>
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Solutions Common to Recommended IAPs
(1 of 2)

- (M) Field a radio with basic encryption at individual Soldier level
- (O) Authorize more communications devices at unit level to support rotational, attached personnel
- (P) Ensure policy supports contractors collaborating electronically
- (D)(T) Develop TTPs that create a method for sharing information horizontally between units and vertically between units and headquarters to facilitate tracer actions
- (M) Improve tracking and reporting capabilities to determine movement asset location (trucks, etc) and cargo contained in assets, by integrating multiple systems into a single tool for complete in-transit visibility
- (D)(O) Allocate and utilize current Army asset-tracking capabilities to other military services and non-military organizations (contractors, etc)
Solutions Common to Recommended IAPs
(2 of 2)

- (O)(T) Modify Movement Control Battalion TOE so that in times of deployment, appropriate Air Force personnel are assigned to the unit. Develop habitual training relationships with supporting Air Force units

- (T) Train individuals on automated tracking & reporting

- (T) Provide MOS-independent training focused on reliable and accurate cargo documentation and consequences of incorrect data; training should be accessible from any location

- (L) Ensure Unit Movement Officers complete sustainment training

- (L) Make SMEs available to provide guidance to unit level Commanders on movement tasks

- (T)(L) Train Port Support Activity personnel on C2 organization and relationships at the SPOD (Sea port of debarkation)

- (T)(L) Establish training for senior and mid-grade Officers & NCOs for relationships w/contractors, and contractor roles & responsibilities
# Solutions That Differ Between Recommended IAPs

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<th>IAPs</th>
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<td>X</td>
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<td></td>
<td>(D)(L) Enact policy that all terminal nodes verify cargo seals to include seal condition and serial number. Enforce the standard for verifying cargo seals.</td>
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<td>(D)(T) Develop joint doctrine on frustrated cargo. Provide frustrated cargo training for TTPs / doctrine to leaders at terminal locations.</td>
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<td></td>
<td>(M) Create repository to share knowledge of frustrated cargo operations.</td>
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<td>(M) Add functionality to existing tracking systems (e.g., MTS) so that the seal serial number can be transmitted with other electronic data about the cargo.</td>
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<td></td>
<td>(M) Develop capability to communicate location and disposition (lost and found) of frustrated cargo to units within theater.</td>
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(‘X’ indicates IAP contains stated solution set)
Summary

Systematically examined net-centric requirements of Transportation Soldiers and recommended solutions to net-centric gaps.

Force Sustainment Soldiers have GOT to get us some o’ that there network-centric’ty!

Don’t ya think we best figure out what it is first?
Questions?