Whither EBO?

Network Enabled Synergy

...and

The Man in the LOOP

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Outline

1. Complexity, The Reality and the Problem
2. The Complexity Paradox and the Man in the Loop
3. Classic EBO
4. Network Enabled + Effects-Based EBO
5. Implications
1. **Complexity: The Reality and the Problem**
## Two Worlds

<table>
<thead>
<tr>
<th>Complicated/ Linear</th>
<th>Complex/ Non-linear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solving</td>
<td>Bounding</td>
</tr>
<tr>
<td>Whole equal to the sum of the parts</td>
<td>Whole <strong>not</strong> equal to the sum of the parts</td>
</tr>
<tr>
<td>Outputs proportionate to inputs</td>
<td>Outputs <strong>not</strong> proportionate to inputs</td>
</tr>
<tr>
<td>Repeatable results</td>
<td>Results <strong>not</strong> repeatable</td>
</tr>
<tr>
<td>Predictable chain of causes and effects</td>
<td><strong>No</strong> predictable chain of causes and effects</td>
</tr>
</tbody>
</table>
Multi-level Interaction
Characteristics of Effects-Based Approach:

1. Focus on Human Dimension
2. Cross-Spectrum
   - All Types of Operations
   - Peace, Crisis, Conflict, Post Conflict
3. Whole of Nation/Coalition Power
4. Complex
2. The Complexity Paradox:

**Complexity Simplifies**

Complexity means:

- There is no perfect awareness
- We cannot definitively “solve” complex problems or foresee all the consequences of an action
- We will not entirely understand the adversary … or ally, or neutral
- We will never have all the answers, and …

*The Human must be at the center of any effort to deal with complex problems*
The Human in the Loop

Human-centric approach offers three key trade-offs

1. The greater the uncertainties, ambiguities, and unknowables…
2. The greater the complexity…
3. The shorter the decision-time…

The greater the human intervention required
Three Continua

- **No Ambiguities, Uncertainties**
  - **No complex aspects**
- **Entirely Ambiguous, Uncertain**
  - **Entirely complex**

Human Intervention

- **Long Lead Time**
  - **Instant Response**
3. “Classic” Effects-Based Operations

Effects-Based Operations **not** new
- Complex world **not** new
- Continua **not** new
- Focus on human dimension, cross-spectrum, whole of nation **not** new

How did we handle ambiguity, complexity, short decision times?
- Relied on the “human in the loop”
  - One complex system to deal with another
  - Problems:
    - Where? When? Why?
    - Decisions imperfect, inaccurate
  - Solutions:
    - Better decision-makers
    - Better organization
The “Human in the Loop”

• **Better Decision Makers**
  – Selecting leaders … and their staffs
    • Social networking
    • Selections processes
  – Training and Education
    • Building analogy libraries
    • Broad education

• **Better Organization**
  – Hierarchical but…
    • Poor Communications = Significant autonomy
  – Impact of Communications Revolution
    • Low level signaling and Instant global media
    • Better communications = Global control
    • … down to the strategic corporal

*But…how do we make EBO better?*
4. Network Enabling Effects-Based Approaches

• First Generation Network Centric Operations
  – Man out of the loop
    • To increase speed of command
    • Sensor to shooter solutions
  – Network architectures vice networking

• Second Generation *Networking*
  – Man *in* the loop
    • Complex decisions inescapable
  – Communications *and Social* Networking…
  – …to tap a nation’s or coalition’s
    • Knowledge/ information resources
    • Analytical/ modeling tools
    • Expertise

\[\text{To increase the probability of correct human decisions}\]
New Metrics for Networking

1. The fewer the uncertainties and ambiguities…
2. The less the complexity…
3. The faster the support…
   But also…
4. The better the networking…

The better the decisions
Four Continua

- Reduced Ambiguities, Uncertainties
- Reduced complexity
- Faster Network Support
- Better Networking
…and Scalability Trade-off

National Command

Military Command

Joint Task Force

Tactical Unit

Warfighter

Decision Time

Faster

Slower

Human Role

Less

Greater
5. Whither EBO?

• Complex Adaptive Systems
  – Multitudes of interdependent variables
  – Continually interacting changing
  – No “solution” good for very long

• Better Effects-Based Operations = Better Decision-making
  – Combining network enabled and effects-based approaches, but…
  – Dealing with complex adaptive systems means
    • Decision makers
    • Organizations
    • Networking
    \[ \text{Must adapt better and faster than adversaries} \]

• “Better” = a Process for changing/ adapting
  – Built around the human in the loop
  – Dealing with large volumes of complex knowledge and information
  – Hybrid of humans, tools, networking
Better Decision-Makers

- Selection
- Education, Experience, Training

Better Organizations

- Agility, Flexibility
- Adapting/ Learning

Networking

- 2nd Generation Networking
  supporting the “human in the loop”
- Adaptive communications
  + social networking

Learning
Interacting
Changing
Co-evolving
Back up
The Road Map

Awareness Creation

Tasking

Collection

Fusion

System Capacity

Priority

Sensors

Human Reporting

Open Sources

Collate

Fuse

Situation

Parameters

Data Handling

History

History

Process

Personnel

Personnel

Mining

Validation

Validation

Interpreting

Mining

Validation

Assessment

Electronic

Human

Sources

Subjects
Social Influence

Mental Models
- Group
- Organization
- Individual

Understanding
- Experience
- Education
- Training
- Level

Sensemaking
- Culture
  - National
  - Organizational
- Global Awareness
  - Access
  - Media

Options Choice
- Viability
- Acceptability