Informing the Transformation

SAS-055
ACT - Norfolk, VA
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Frequency Asked Questions

• What is NCW? What is Power to the Edge?
• Why are they critical to success in the 21st Century?
• How is NCW related to transformation? To EBO?
• Are NCW and Power to the Edge proving out in practice?
• Are we creating new vulnerabilities?
• Will it be harder for coalition partners to work with the US?
• Is an Information Age transformation affordable?
• What should we do / invest in first?
Assessment Challenges

- Predicting the Future – A discontinuous future
- Lack of Experience and Expertise
- Lack of empirical data
- Need for new measures of value
- Complexity resulting from Co-evolution
- Key measures related to IO are in the cognitive and social domains
Agenda

- DoD Transformation
- NCW: the Initial Instantiation
- Power to the Edge: the next step
- The Last Mile: Beyond Command and Control
- Implications for Analysis
Transformation is about adaptation to changes in the sources of power.
Information Age Transformation
A Key Element of Defense Strategy

Warfighting / Military Operations

How we fight ........
New Concepts & Capabilities

• Battle Space Awareness
• Command and Control
• Force Application
• Force Protection
• Logistics

New Mission Challenges

Opportunities

How we do business .......
New Processes and Systems

• Accounting & Finance
• Acquisition
• Human Resource Management
• Strategic Planning and Budgeting
• Logistics
• Installations & Environment

Business Side of DoD

The Information Age requires we re-think everything!
Transformation

- Transformation is a response to the Information Age
  - Broad vision of competitiveness v. security challenges
  - Information Age focus
- Intellectual Foundations of DoD Transformation
  - NCW
  - EBO
  - Power to the Edge
- Enterprise Strategy
  - Co-evolution of Mission Capability Packages
- Pervasive changes are required
  - How we plan, prioritize
  - What we investment in
  - How we use information
  - Approach to Command and Control
21st Century Security Challenges characterized by huge amounts of uncertainty and risk

Agility is the answer to uncertainty and risk

Robust - effective across a range of conditions;
Resilient – able to function / degrade gracefully / reconstitute when damaged
Responsive - speed of recognition and action;
Flexible - multiple ways to succeed, seamless shifting;
Innovative – learning and solving
Adaptive – alteration in C2 organization and process.
Status of DoD Transformation

- Intellectual Foundation developed to first order
- Commitment articulated by senior leadership
- Incorporated in policy, planning, and acquisition guidance
- Investments in Infostructure
  - NII Initiatives
- Program of Experimentation
- Proofs of Concept emerging
- New Doctrine
- Global phenomena
- Maturity and the last mile of transformation
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The Tenets of NCW

A *robustly networked force* improves *Information Sharing*

*Information Sharing* and *Collaboration* enhances *Quality of information and Shared Situational Awareness*

*Shared situational awareness* enables *Collaboration and Self-synchronization*

These, in turn, dramatically increase *mission effectiveness*
Linked Hypotheses: The Value Chain
Need for Co-evolution

• Co-Evolution is Essential
  • Isolated Changes May Have Dysfunctional Results
  • Coordinated Changes Have Synergistic Results

• Therefore, we need to think not in terms of acquisition but in terms of Mission Capability Packages
Migration Path: Getting to the Vision
measuring and understanding progress

Command and Control

Developing Situational Awareness

Shared Awareness

Info Sharing

Organic sources

Traditional Collaboration Self-synch

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• DoD Transformation

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• Power to the Edge: the next step

• The Last Mile: Beyond Command and Control

• Implications for Analysis
Power to the Edge

- **Power** is about the ability to accomplish something in a timely manner overcoming resistance

- **The Edge** is where the action is; where the organization or system meets the real world

**Power to the Edge** is about providing more means and opportunities to the entities that get things done
NCW and Power to the Edge

- The NCW Tenets are a set of linked “value chain” hypotheses

- Power to the Edge articulates the policy, organizational, and command and control approaches that can make the promise a reality
Power to the Edge: more than ‘networking’

- Internet Protocol…packet switched not circuit switched network
- Secure Communications…end to end encryption, hardened against denial of service
- Only Handle Information Once…data posted by authoritative sources
- Post in Parallel…producers make their data available as soon as it is created
- Smart Pull…users can pull data directly form the Network
- Data-Centric….data separate for applications, which to talk to each other by posting data
- Application Diversity…users can operate multiple applications using the same data
- Assured Sharing…trusted accessibility to network resources
- Quality of Service…Data timeliness, completeness and integrity
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Traditional  Collaboration  Self-synch

The Last Mile of Transformation

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Correct Inferences

- Information Age approaches offer opportunities to bring more of our information and more of our assets to bear.
- New vocabulary is needed to prevent us from myopic exploration.
- New set of criteria needed to assess new approaches to accomplishing the objectives associated with command and control.
- The success of coalition operations will depend upon the compatibility of approaches to command and control.
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Formulation Challenges

• Formulation
  – Identification of relevant variables
  – Determination of objective function (dependent variables = value)
  – First order relationships
  – Constraints

• Formulate from a “Network Centric” perspectives
  – Include variables that reflect key concepts
  – Go beyond specific mission effectiveness to agility
  – Represent / consider new command concepts
Key Concepts and Variables

- Information sharing and shared information
- Collaboration
- Awareness and shared awareness
- New command concepts
- Coalition related issues
- Full range of effects (military, diplomatic, economic, social)
- In all of the domains (physical, information, cognitive, social)
From Concept to Capability
Key Role of Experimentation
Mission Capability Package Creation

**Mission Discovery Experiments**
- Force Structure
- Command and Control
- Mission Requirements
- Concept Development

**Experimentation**
- Hypothesis Testing
- Analysis
- Models
- War games
- ATDs
- Simulations

**Concept Refinement**
- Doctrine Development
- Command Reorganization
- Education
- Training
- Systems Development

**Concept Implementation**
- Fielded Mission Capability Package

**CO-EVOLUTION**
- Organization
- CONOPS/Doctrine
- Logistics
- C4ISR Systems
- Command Arrangements
- Weapons Systems
- Training/Education

**Personnel**

**Embryonic MCP**

**Ideas**

**Technology**
Related Efforts

- NCO Conceptual Framework
- SAS-050
- DoD Case Studies
Some Take Aways: NCW

- NCW is more about networking than networks
- NCW is the military’s adaptation to the Information Age
- NCW involves the redefinition of command and control
- A new vocabulary and a new set of criteria are needed
- The success of future coalition operations will depend upon the compatibility of approaches to command and control
- NCW applications will be developed, matured over time
Some Take Aways: Analysis

• A comprehensive conceptual framework is essential
• There is not a lot of data about the future
• It is better to include the right variables even if one cannot directly measure them than to ignore them
  – Sensitivity analyses
  – Expert judgments
  – Explicit Assumptions
• All four domains must be instrumented and mined for data
• Agility is the preferred MOE
Informing the Transformation

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