

Module 3

Complex Endeavors

Network Enabled Command and Control
Short Course

Dr. David S. Alberts
October 2009

Questions Addressed

- What are the defining characteristics of 21st Century missions?
- Why are 21st Century missions considered to be “complex endeavors”?
- What is the most valuable capability for an entity to have in the 21st Century?
- What are the implications of complex endeavors for “command and control”?

Agenda

- The nature of 21st Century missions
- The nature of the “forces” needed to accomplish these missions
- The strategic challenge for organizations

21st Century Missions

21st Century Missions are *Complex Endeavors*

Complexity in the Task and Environment

+

Complexity of 'Self'

=

Complex Endeavor

Task and Environment

Humanitarian Assistance

Peace Keeping

Counter Terrorism

- The complexity of the mission is a result of the interactions between and among the effects, particularly across dimensions, and the uncertainties associated with a cascading effects chain
- The success of 21st Century Missions requires a multi-dimensional effects space
 - *political, social, economic, military*

Disaster Relief

Counter Insurgency

Stability Operations

Mission Space Variables

The nature of the effects space (dimensionality, degree of coupling, degree of uncertainty, level of risk) depends on

- Nature of the operations
(peacekeeping, combat, stability, counter-terrorism, humanitarian assistance/disaster relief, “multi-block”, counterinsurgency)
- Stability/predictability of the environment
- Transparency
- Familiarity
- Infrastructure (austere, supportive)
- Nature of intent or purpose (clarity, unity)
- Response strategy
- Duration of operation

Complexity of Self

- Self = A large number of heterogeneous, independent entities that differ significantly with respect to:
 - Culture, values and norms;
 - Perspectives and perceptual filters
 - Laws, policies, rules, and regulations;
 - Practices and processes;
 - Levels of trust;
 - Language;
 - Information and communications capabilities;
 - Approach to organization and management.
- The complexity of 'Self' comes from the nature of the interactions between and among the participating entities and the dynamics of the situation that affect entity willingness, constraints, perceptions, and capabilities.

The Collective

- A dynamic mix of

U.S. Military

NGOs

U.S. Federal
Departments

Red Cross

U.N. Forces

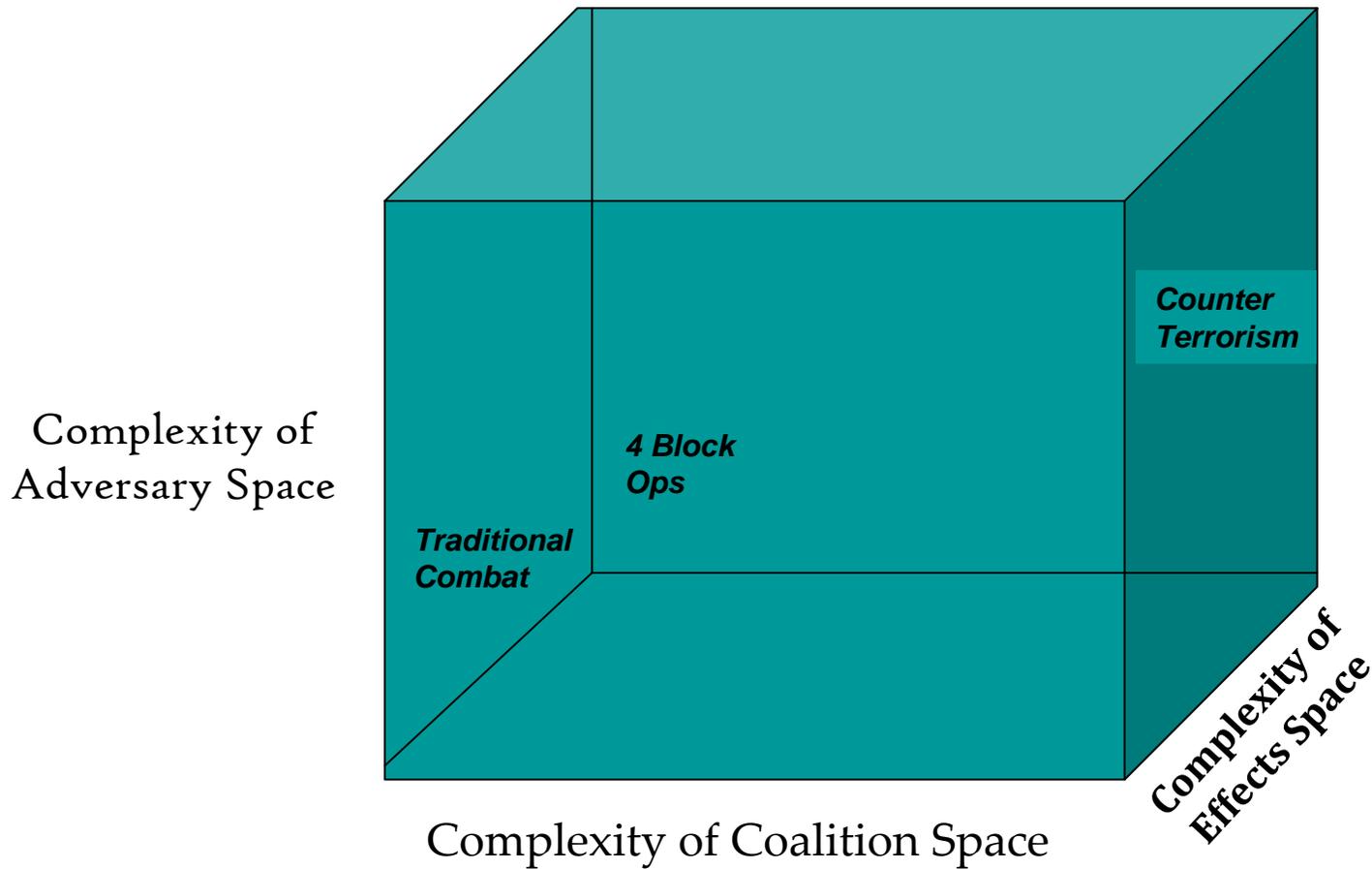
U.S. State and Local
Governments

Host
Governments

PVOs

NATO Military

Complex Mission Space



21st Century Mission Challenges

1. Missions cannot be adequately predicted.
2. Ignoring the complexity of situations ensures failure.
3. Adversaries exploit seams and weaknesses avoiding strengths.
4. A plan is nothing; planning is everything.
5. Civil-military coalitions and broader effects spaces are essential for success.

Uncertain - Complex - Dynamic

21st Century Mission Challenges

1. Missions cannot be adequately planned in advance
2. Ignoring the complexity of the environment leads to mission failure
3. Adversaries exploit our strengths and weaknesses
4. Adversaries are unpredictable
5. Military operations are essential for national security

Uncertain-Unpredictable-Complex-Dynamic

This requires agility.

The effects space is social, political, economic as well as military

This requires a civil-military coalition.

Uncertain - Complex - Dynamic

Agility

- We need to be able to undertake a wide variety of missions
- We need to be able to work with heterogeneous sets of mission partners
- We are faced with a security environment that is increasingly complex and uncertain
- Therefore we need
 - Agile Command and Control arrangements
 - Agile People
 - Agile Organizations
 - Agile Systems
 - Agile Acquisition Processes
 - Agile

Agility

Agility is the ability to maintain effective C2 as a function of changing circumstances and stresses

Robust - effective across a range of conditions

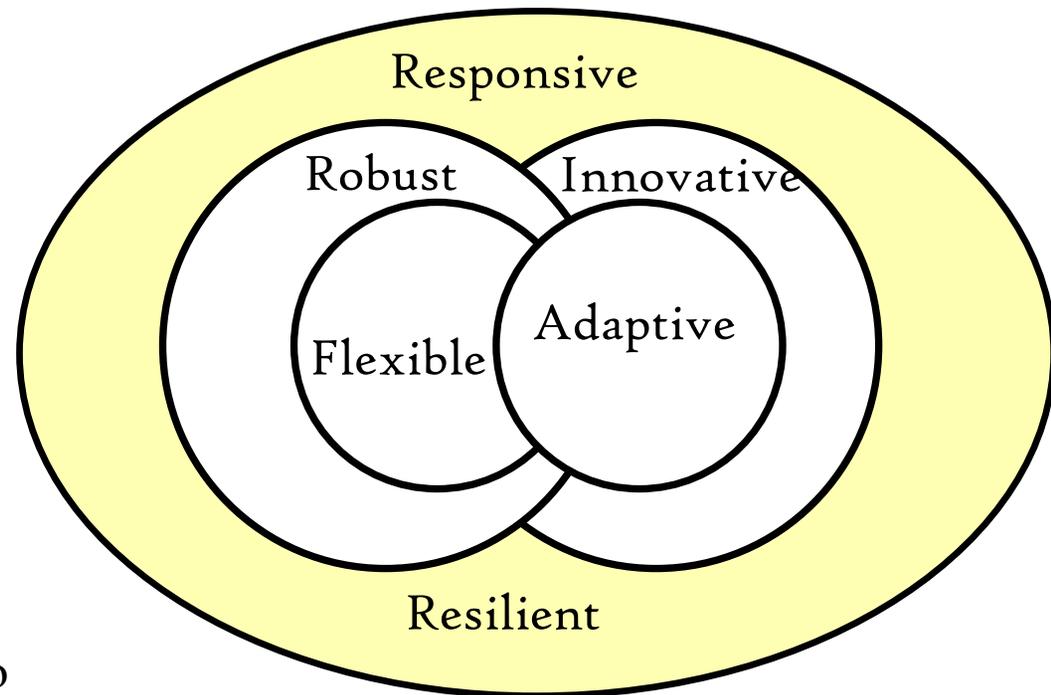
Resilient – able to function, degrade gracefully, and reconstitute when damaged

Responsive - speed of recognition and action

Flexible - multiple ways to succeed, seamless shifting

Innovative – learning and solving

Adaptive – alteration in approach to C2, organization, processes



Agility

- Agility involves more than being able to recognize the nature of the situation as well as changes to the situation and adjust one's approach to C2 accordingly
- Agility also involves being able to maintain an acceptable level of performance/effectiveness in the face of:
 - Physical, Electronic, and Cyber attacks that destroy or degrade nodes and/or links
 - Information attacks that results in a loss of information or the insertion of misinformation
 - A loss of trust in information, services, or entities
 - An austere environment that limits connectivity and services
 -

20st Century Value Metrics

- Speed
- Correctness
- Precision
- Stealth

20st Century Value Metrics

- Speed

- Correctness

- Precision

- Stealth

3 out of 4 point us in the wrong direction

The 4th is an enabler not an end in itself

The transformation requires a new set of value metrics and priorities

Agility is the 21st Century's Metric of Value

- Attributes of the Mission
 - Uncertainty (who, where, how)
 - Complexity (multi-dimensional effects based space)
 - Lack of predictability
 - Joint, combined, integrated (with non-traditional partners)
- Agility is the logical response to complexity, uncertainty, and risk
- Enablers of Agility
 - Information sharing (within and with others)
 - Collaboration
 - Command and Control approach appropriate for the mission and the nature of the collective

everyone, every organization, every process, and every system must be agile

Implications for Command and Control

- There will not be a unified chain of command
- Entities will each have their own intent
- Entities will each have their own approach to C²
- There will be multiple planning / execution processes
- The situation will be, in part, unfamiliar to all entities
- Critical information and expertise necessary to understand the situation will be non-organic
- Actions, to be effective, will require developing synergies between and among entity actions

Key C² Issues

Is Command and Control (in the traditional sense)
for Complex Endeavors an Oxymoron?

Is there a new approach to accomplishing the
functions we associate with
traditional Command and Control
that has a better chance of success?

Key C² Issues

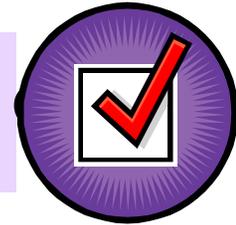
Is Command and Control (in the traditional sense)
for Complex Endeavors an Oxymoron?

Is there a new paradigm for accomplishing the
function of Command and Control with
traditional Command and Control
that has a better chance of success?

The Answer
is
YES !

Getting to Yes

Step 1: Recognize the need for new approaches to



Preview of Module 4

- A new language
- Explore the space of possibilities
- Make the investments in co-evolution

Summary

- What are the defining characteristics of 21st Century missions?
complex, uncertainty, risk
- Why are 21st Century missions considered to be “complex endeavors”?
complexity in the task and a complex, heterogeneous self
- What is the most valuable capability for an entity to have in the 21st Century?
agility
- What are the implications of complex endeavors for “command and control”?
new language and new approaches