Mission Command & the limits of self-organization

Eric-Hans Kramer
Netherlands Defense Academy (NLDA)
24-6-2015
Fj.kramer@mindef.nl
Core of my presentation

Topic:
• Challenges to mission command in relation to concepts surrounding “network centric operations”

My argument:
• Underlying such concepts is a naïve idea about control in networks
• A lack of attention for organization design and for organizational context challenges the successful implementation of Mission Command
My background

- Netherlands Defense Academy
- Faculty of Military Sciences
- Associate Professor in Human Factors & Systems Safety

I base the arguments in this presentation on:

- Sociotechnical systems theory
- Normal Accidents Theory
Steps in my argumentation

• A sketch of “Radical Mission Command Theory”

• Confrontation of this idea with:
  – Some empirical illustrations
  – A theoretical analysis
Outline of Radical Mission Command Theory

Basically, RMCT is NEC complemented with MC

- Information Technology can be used to create “robustly networked organizations”

- This enables rapid information sharing between units and can create excellent decentralized Situational Awareness
Outline of Radical Mission Command Theory

• This opens up the possibility to implement radical forms decentralization

• “Control” in such complex adaptable networks emerges as a result of the collective initiative of the decentralized units

• Radical Mission Command Theory promises flexibility, agility, adaptability
Outline of radical Mission Command Theory

Some key phrases that describe this perspective:

• Self-synchronization
• “Edge-organizations”
• Emergent management

Found for example in the work of Alberts & Hayes
Outline of radical Mission Command Theory

Bousquet (2008, p.927):

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Thermodynamics</th>
<th>Cybernetics</th>
<th>Chaoplexity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key technology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clock</td>
<td>Engine</td>
<td>Computer</td>
<td>Network</td>
</tr>
<tr>
<td>Scientific concepts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Force</td>
<td>Energy</td>
<td>Information</td>
<td>Information</td>
</tr>
<tr>
<td>matter in motion</td>
<td>entropy</td>
<td>negentropy</td>
<td>non-linearity</td>
</tr>
<tr>
<td>linearity</td>
<td>probability</td>
<td>negative feedback</td>
<td>positive feedback</td>
</tr>
<tr>
<td>geometry</td>
<td></td>
<td>homeostasis</td>
<td>self-organization</td>
</tr>
<tr>
<td>Form of</td>
<td></td>
<td>command and</td>
<td>decentralization</td>
</tr>
<tr>
<td>warfare</td>
<td></td>
<td>control</td>
<td>swarming</td>
</tr>
<tr>
<td>close order drill</td>
<td>mass mobilization</td>
<td>automation</td>
<td></td>
</tr>
<tr>
<td>rigid tactical</td>
<td>motorization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>deployments</td>
<td>industrialization</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Outline of radical Mission Command Theory

• These are very bold promises that seem to ensure MC a very bright future

• It seems that in “the network” the issue of “design” is solved: just establish connections & order will emerge!

• I want to argue that this is overly optimistic, indeed “wishful”
The argument against Radical Mission Command Theory

Not an argument against:
- MC as such
- The use of IT, or technological development in general
- The importance of factors such as leadership
- Complexity science

But against:
- “Wishful” characteristics of RMCT
Examining a network

• Dutch mission in Uruzgan, Afghanistan 2006-2010

• TFU was an expeditionary unit – ad hoc organization – consisting of a collection of 49 units of the Dutch Armed Forces

• PhD of Matthijs Moorkamp is specifically focused on studying the network dynamics in relation to safety

Examining a network

Some observations:

• Developing a network is more than establishing a technological connection

• Different units worked on understanding crucial interdependencies between their operations

• Decentralized units pragmatically solved interdependencies between themselves

• But were unaware of effects of their solutions further down the network
Examining a network

• Some crucial nodes became “overheated” (UAV; FAC)

• Several (unreported) incidents (near misses): basic lack of control in the network
  – “It was the wild west out there”

• Attempts at centralizing control
The argument against Radical Mission Command Theory

• On the level of the decentralized unit: interference

• A decentralized unit needs elbow room in order to control different demands from the network

• If these demands are increasingly unpredicted, speedy & unseen they can interfere
  – bouncing back a control problem to the network
The argument against Radical Mission Command Theory

Normal Accidents Theory
Charles Perrow (1984, 1999)

As systems grow in complexity and connectedness the probability of cascading failures increases.

A function of:
1. Disruptive influences from an environment
2. Many interactive parts
3. Tightly coupled relations between parts
The argument against Radical Mission Command Theory

• In systems with complex interactions and tight couplings, the conditions for effective control are unbalanced
  – Complex interaction asks for decentralization
  – Tight coupling asks for centralization

• RMCT moves the network in the direction of complex interaction & tight coupling
The argument against Radical Mission Command Theory

• NAT would say that RMCT establishes the conditions for Normal Accidents: for cascading failures

• RMCT intentionally moves a system “out of control”

• Note: a cascading failure is also emergent! That’s the very point of NAT!
Challenges to Mission Command

The theoretical side

• The idea of self-synchronization, “order for free” is overly optimistic.

• Every node that is added to a network, makes the network exponentially more complex
  \[ n(n-1)/2 \]

• At some point network develops with critical interdependencies beyond the understanding of decentralized units

• This sets limits to the possibility of decentralized decision making
Challenges to Mission Command

The empirical side

• The increasing complexity of – joint – combined – expeditionary missions poses a challenge to MC

• Increasingly complex networks of interdependent units threaten the elbow room at the decentralized positions

• This threatens the implementation of MC: quite understandably, there will be a tendency to centralize certain processes

• What is necessary is the development of – realistic – ideas about how to design such networks with MC in mind
Back to old school Mission Command Theory

Van Creveld (1985):

On information technology (p.275)
- “Far from determining the essence of command, then, communications and information processing technology merely constitutes one part of the general environment in which command operates. To allow that part to dictate the structure and functioning of command systems, as is sometimes done, is not merely to become the slave of technology but also to lose sight of what command is all about.”

On organizational structure (p.268)
- “The more numerous and differentiated the departments into which the organization is divided, the larger the number of command echelons superimposed upon each other, the higher the decision thresholds, and the more specialized its individual members, then the greater the amount of information processing that has to go on inside the organization.”
Final points

• The issue of implementing MC is often portrayed as just a matter of convincing officers & soldiers
  – This analysis shows that reluctance to decentralize can be quite rational

Following the logic of Perrow:

• To enable decentralization in complex environments you need **loosely coupled networks**
• This is an issue of design