

Complex 07, Gold Coast, July 2-5 2007

# The Adaptive Stance



**Anne-Marie Grisogono**

Defence Science and Technology Organisation

Australia

## **Copyright**

*Permission is granted for this material, presented at the 8th Asia-Pacific Complex Systems Conference (Complex'07), 2-5 July 2007, Surfers Paradise Marriott Resort, Queensland, to be available on the Complex'07 website to be shared for non-commercial, educational purposes, provided that this copyright statement appears on the reproduced material, and notice is given that the copying is by permission of the author(s). To disseminate otherwise or to republish requires written permission from the author(s).*

---

**ARC Centre for Complex Systems**

School of ITEE | The University of Queensland | ST LUCIA QLD 4069 | AUSTRALIA

T: +61 7 3365 1003 | F: +61 7 3365 1533 | E: [outreach@accs.edu.au](mailto:outreach@accs.edu.au)

**[www.complex07.org](http://www.complex07.org)**

# Outline

- **Background**
- **Human Challenges of Adaptive Campaigning**
- **The Adaptive Stance**



# Background



**Military Imperative**

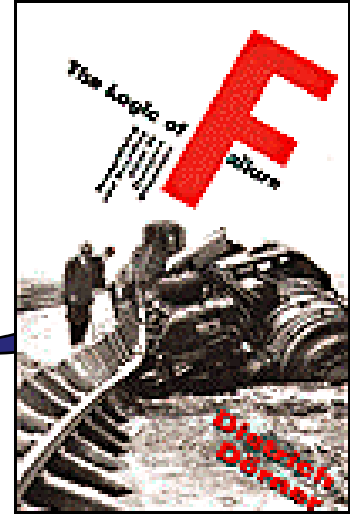
- Recent Operations
- Complex Warfighting
- Insights and ideas

**Research in CAS for defence**  
Dealing with complexity  
Exploiting adaptivity  
Insights and opportunities



**ADAPTIVE  
CAMPAIGNING**  
THE LAND FORCE RESPONSE  
TO COMPLEX WARFIGHTING

**Operationalised  
Adaptive  
Campaigning**



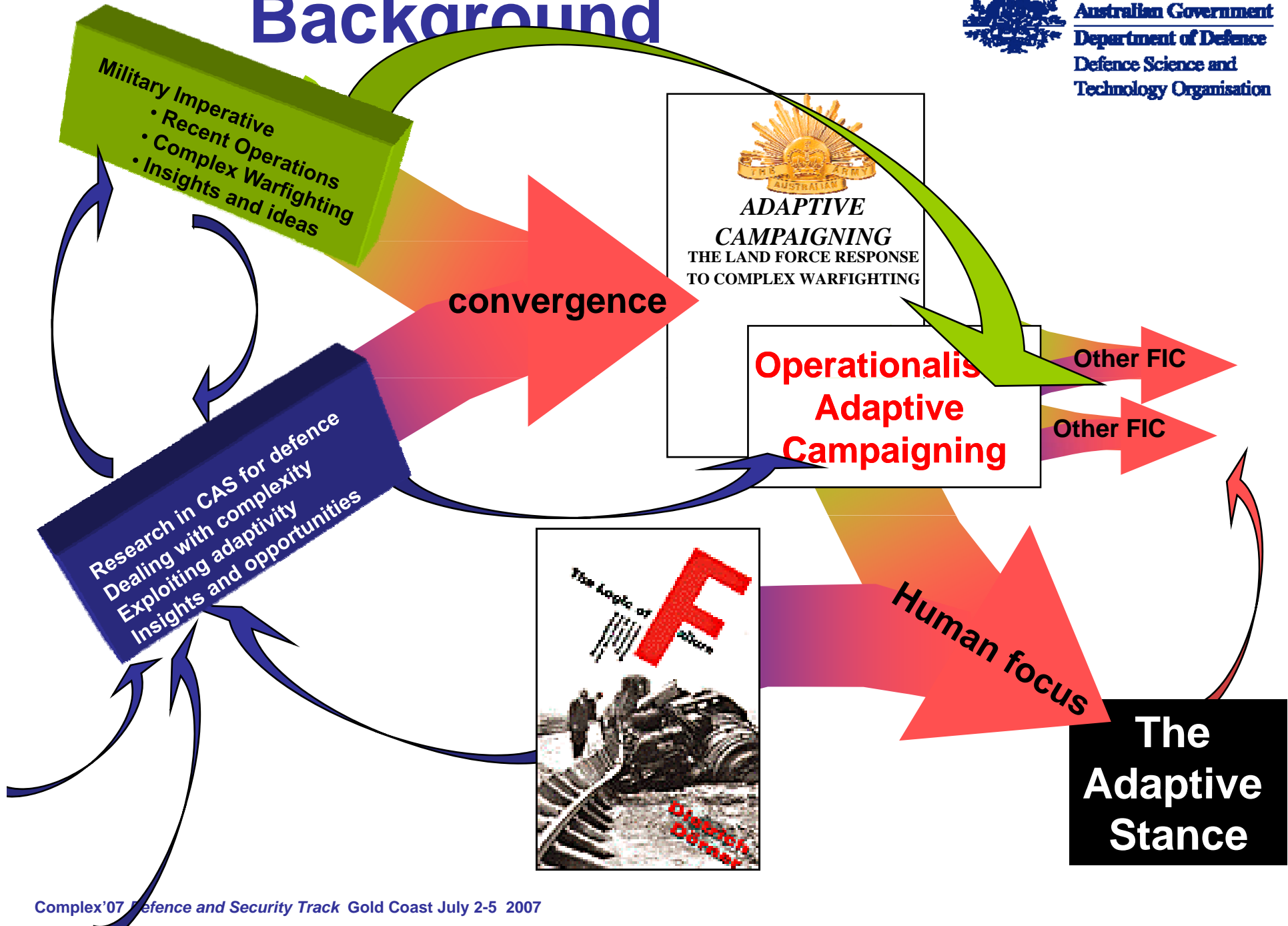
Other FIC

Other FIC

**Human focus**

**The  
Adaptive  
Stance**

convergence



# Challenges

## Approach

- **Creating Adaptivity**  
*How to use our existing adaptive capabilities*  
*How to develop new adaptive mechanisms*
- **Complex Objectives**  
*Success = networked interdependent objectives*  
*Associated measures of success span many scales*
- **Complex Networked Causation**  
*Multiple agendas, multiple relationships between players, deception and hidden information, complex physical environments, all interconnected and with which the players interact*
- **Complexity of our own Systems**  
*Integrating systems and forces with different cultures, capabilities and doctrine to create effective, resilient and agile networked force*
- **Limitations of Human Cognition**  
*Limits in dealing with large scale complexity when the adaptive behaviour required extends over larger scale than what a small team can do alone*

**Conceptual Framework for Adaptation**

Research on mapping, modelling, visualising, analysing, influencing complex causal and influence networks

Complex systems engineering  
Networking & integration  
WoG, coalition, interagency operations  
Self-organisation and the “new C2”

**Dörner’s work on complex decisionmaking**

# Overview of Conceptual Framework for Adaptation



- A generic model of adaptation – *what it is*
- Types of adaptive mechanisms – *implementation strategies*
- Classes of adaptive mechanisms – *what it deals with*
- Levels of adaptation – *what aspect of the system it affects*
- Scale of adaptive mechanisms – *what level of the system it affects*
- Measures of success – *how to measure if it works*
- Health of adaptive mechanisms – *factors that influence their effectiveness and how to make them work*

**References available**

## References for Addressing Complex Problems

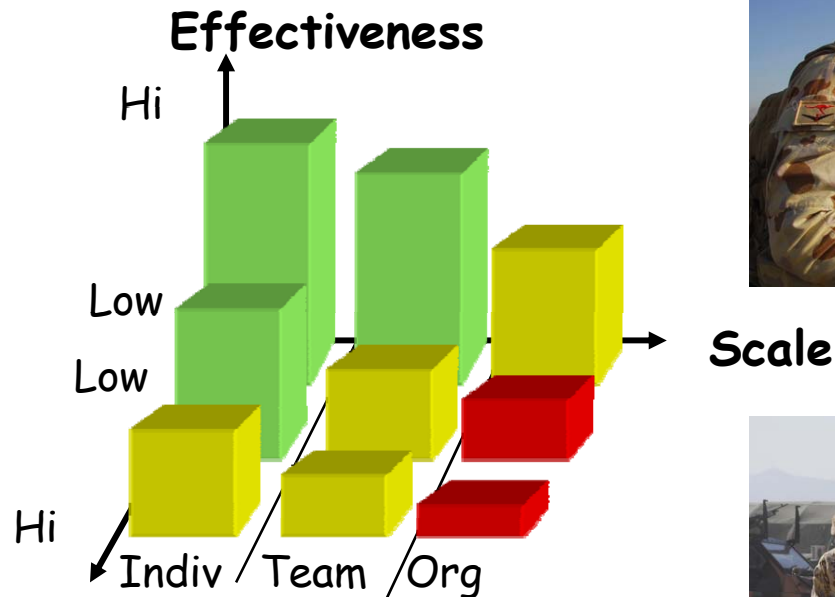
*Diagnostic tools,  
analysis of temporal dynamics and  
adaptivity implementation guidelines*



# How Adaptive are we really?

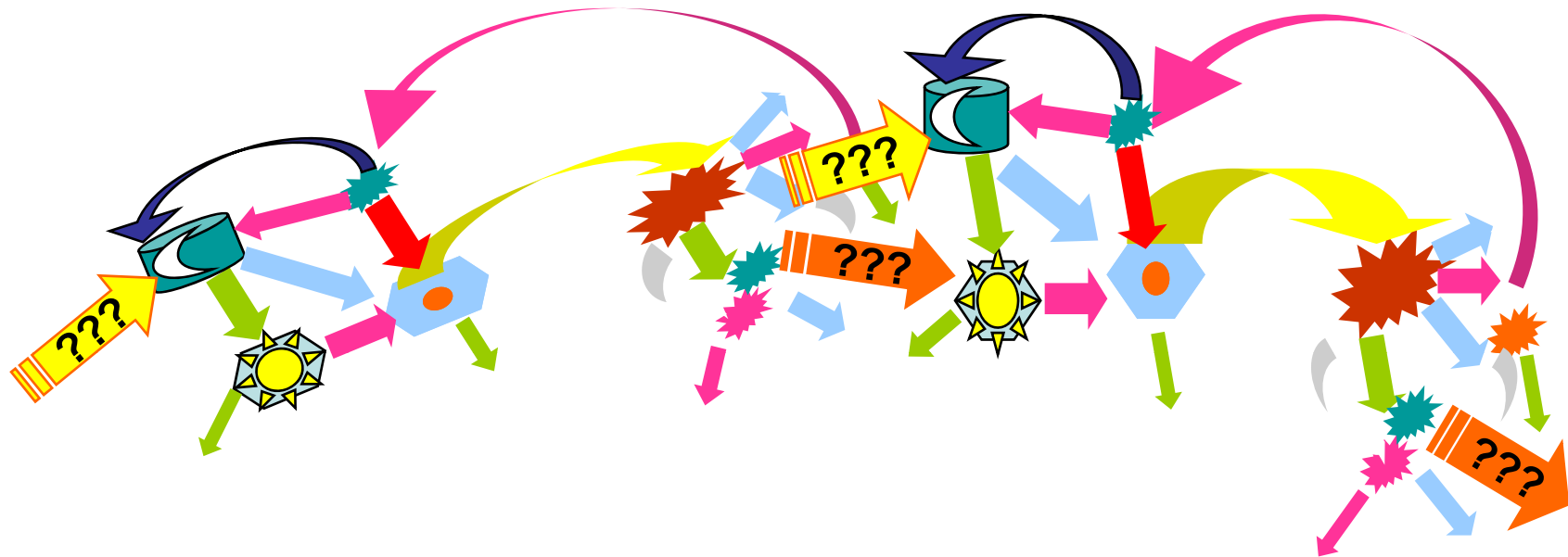


Complexity  
of problems



- Bottom line: we have a grip on what adaptation is and how it works
- BUT... how do we push the envelope of human adaptivity?
- ... and how do we apply it at an organisational level?

# Interacting with Complex Causal and Influence Networks (C&INs)



What to do???

Predictability requires knowing how system **behaves**  
- **impossible**

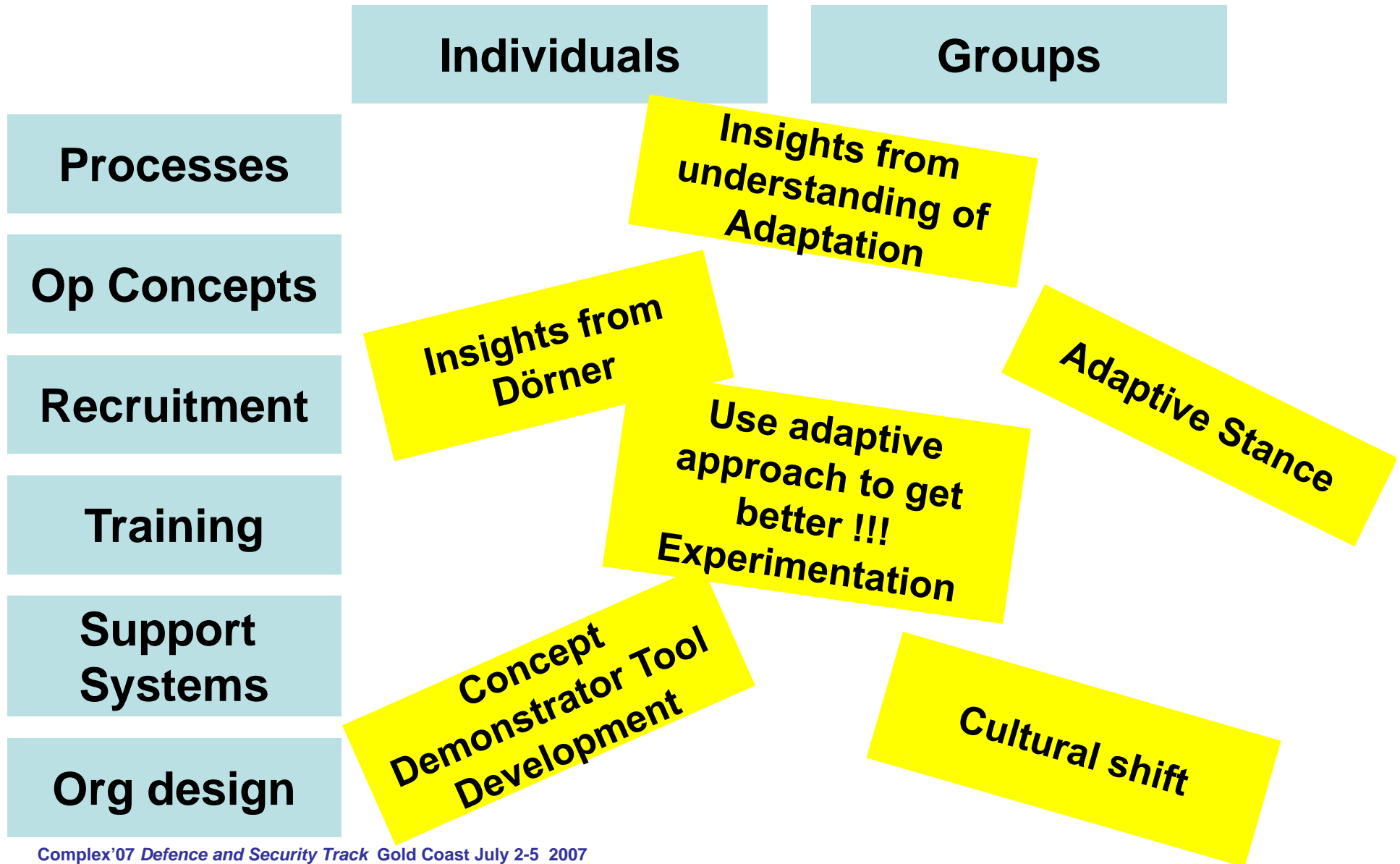
Influencability requires knowing how system **adapts**  
- **more useful, & more possible!**

**Successful intervention in C&INs requires Adaptive Stance**





# Getting Better At It



# Individual Human Ability to deal with C&INs

- Explores limitations of human cognition through case studies and extensive microworld experimentation
- Identifies difficulties with:
  - Projection of nonlinear processes
  - Long timescales (oversteering)
  - Interdependencies (complexity)
  - Choosing right goals, making them +ve, explicit and measurable
  - Negative information
  - Dealing with contradictory goals
  - Taking responsibility, self-criticism, reflection on own approach
- **YET... a minority do succeed!!!**
- Many implications for improving our abilities to deal with complex situations
- What to target, how to measure it...

## Dietrich Dörner: “The Logic of Failure”



# Where Organisational Learning Opportunities Are

| Decision or action<br>Outcome | “Unacceptably” wrong   | “Acceptably” wrong   | Right   |
|-------------------------------|--|--|---|
| Catastrophic                  | Sanctions or punitive Measures   | Learn about context.<br>Learn about the boundaries of what is/isnt acceptable  | DON'T SCAREGOAT!!<br>Review boundaries between “wrong” and “right”<br>LEARN RESILIENCE<br>Learn about the complex dynamics leading to outcome                               |
| Wrong                         | Sanctions or punitive measures   | Corrective measures<br>(individual learning)   | DON'T SCAREGOAT!!<br>Review boundaries between “wrong” and “right”<br>improve decision process and decision support.<br>Learn about the complex dynamics leading to outcome |
| Right                         | Review how ‘unacceptable’ is defined.<br>Sanctions or punitive measures. | STOP BLAME GAME<br>“near misses”<br><i>air safety vs medical safety</i><br>Learn about tolerances, and robustness of processes.<br>Learn about the complex dynamics leading to outcome | Confirm what was already known or guessed   |

# Outline

- Background
- Human Challenges of Adaptive Campaigning
- **The Adaptive Stance**



# Adaptive Stance supports Mission Command

**A stance to be adopted, and encouraged in individuals  
the Adaptive Stance is a necessary complement to  
Mission Command - neither will work without the other,**

- needs to be adopted throughout the force and especially at upper echelons first and then downwards - in order to enable subordinates to adopt it too,
- resistance to urge for closure and certainty,
- not being seduced by one's own ideas
- appreciating that it is much more important to be prepared to be wrong in order to learn, than to always be right (and therefore either or both risk-averse or in denial)
- 'decriminalising' others being wrong – stop the 'Blame game'

# The Adaptive Stance supports **Individual** Adaptivity

- accurate persistent awareness of assumptions and hypotheses in one's mental models and constructs used for interpreting observations, and for generating and assessing action options
- ability to simultaneously maintain alternate versions of above
- continuously seeking ways to test assumptions and being prepared to revise them as a result
- whenever a prediction is made, being willing to observe the actual outcome when it transpires and to objectively assess what can be learned in order to improve future predictions and to gain a more accurate sense of the quality of one's predictive ability
- realising that every decision or action taken contains an implicit prediction, making those predictions explicit and ensuring that means are put in place to observe what actually happens, to compare that to the predictions, and to use that comparison to learn and develop better mental models of the situation

# The Adaptive Stance supports **Force** Adaptivity



Australian Government  
Department of Defence  
Defence Science and  
Technology Organisation

**extending the notion of 'every soldier is a sensor' to have every soldier be:**

- aware of the current shared understanding, or 'model', of the C&INs operating in the context,
- aware of critical uncertainties, conjectures, hypotheses ('critical' = impacts on significant decisions), and
- therefore alert to observing evidence and indications in the course of their daily operations, that would reinforce or contradict any aspect of that understanding, and
- assiduous about reporting such observations through appropriate means so that the shared understanding can rapidly evolve to better reflect the real complex dynamics of the situation, by leveraging from the individual learnings and observations of every soldier.

# Way Forward

- Lab experimentation to identify what aspects are trainable and to develop effective interventions
- For aspects not trainable – review selection and recruitment criteria
- System design and development → better decision support tools
- Develop better processes through experimentation and ops support
- Team with Army to address culture shifts





Australian Government  
Department of Defence  
Defence Science and  
Technology Organisation

# Thank You

