

18th ICCRTS

Track 1: Concepts, Theory & Policy

Paper 1-028: Orders of C2 agility and implications for information and decision-making/taking

Lorraine Dodd
Cranfield University
Defence Academy of the United Kingdom
Shrivenham
Wilts SN6 8LA
United Kingdom

Geoff Markham
QinetiQ
St Andrew's Road, Malvern
Worcestershire WR14 3PS
United Kingdom

With acknowledgements to:
Peter Houghton, Dstl

June 2013

Contents

1. Introduction
2. Forms of time: Time, timing and timeliness
 - Time and organizational structure
 - Types of knowledge and decision-taking/making
 - Time, reporting, remembering and learning
 - Forms of time relate to orders of agility
 - Forms of time leading to orders of agility
3. Orders of agility
 - Continuity and variety
 - Decision spaces - making and taking decisions
4. Shared situation awareness and appreciation
5. Summary

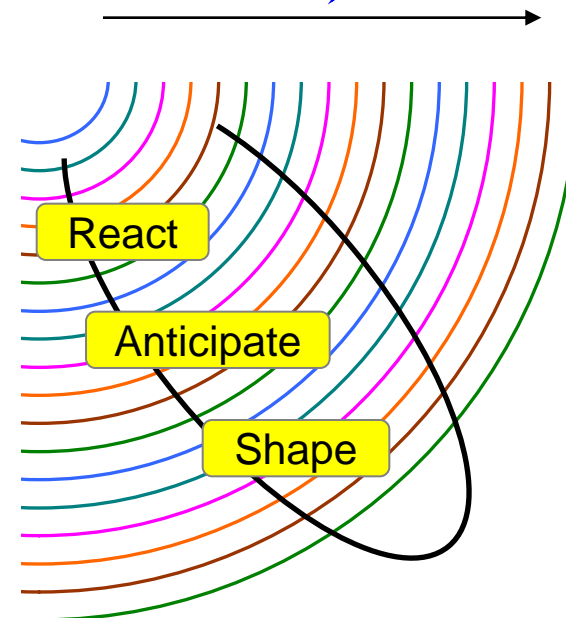
1. Introduction

- Agility, a theme about change and changing, arises in relation to a range of endeavours in the military and the non-military world, appearing in accounts of practical experiences or in statements of aspirations.
- Concepts of C2 agility have been studied, sponsored by UK MOD, within:
 - Command, Inform and Battle Management (CIBM) Research: C2 agility (2011-13)
- In our paper at last year's conference†, we focussed on different ways of reasoning with time in the context of agility, including both how agility is engendered and how agility is exhibited.
- Now we are extending this idea to look at *orders of agility*.
- Classifying four orders of agility and understanding the conditions which engender the different orders of agility and/or require decision-makers to move between them.

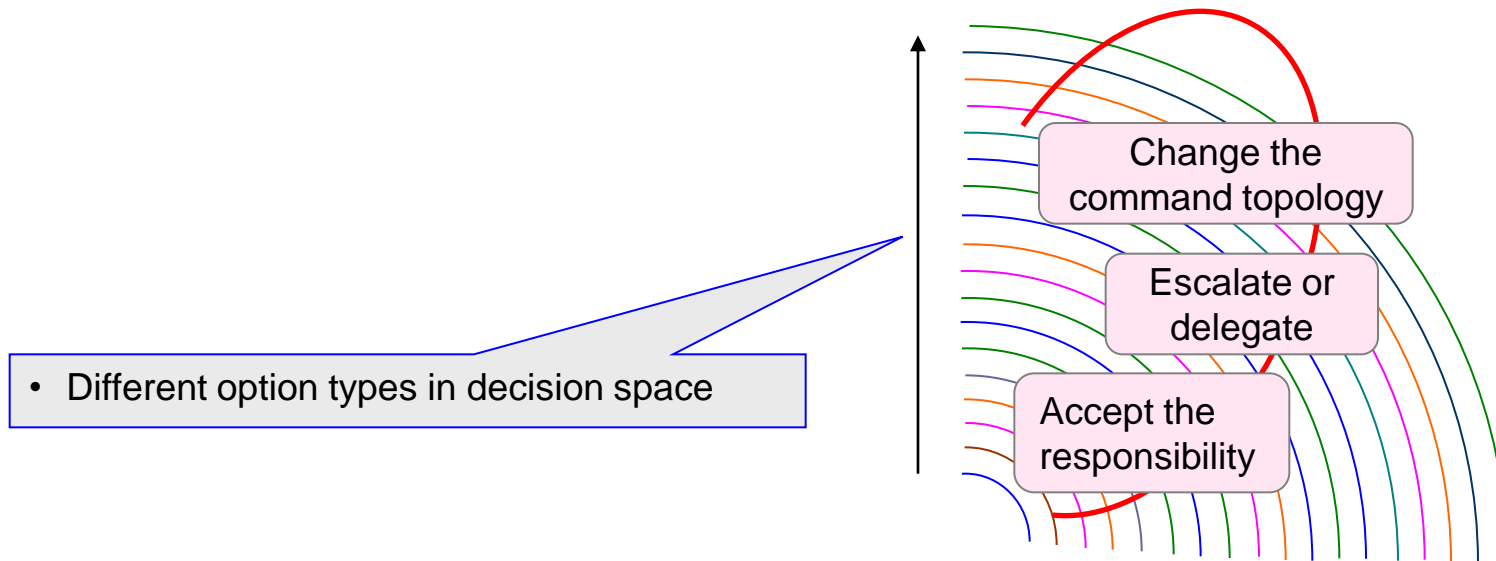
† 'C2 agility, different models of change and reasoning with time', Paper 014, 17th ICCRTS

2. Forms of Time: time, timing and timeliness

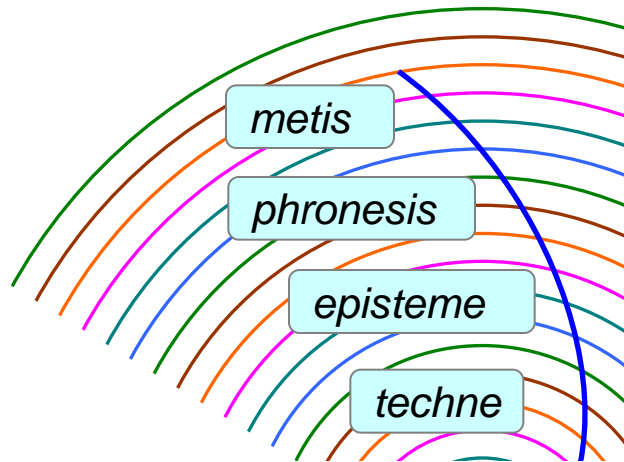
- Different ways of reasoning about the future
- Chronos through to kairos
- Time, timing and timeliness



2. Time and organizational structure



2. Time, types of knowledge and decision-taking/making

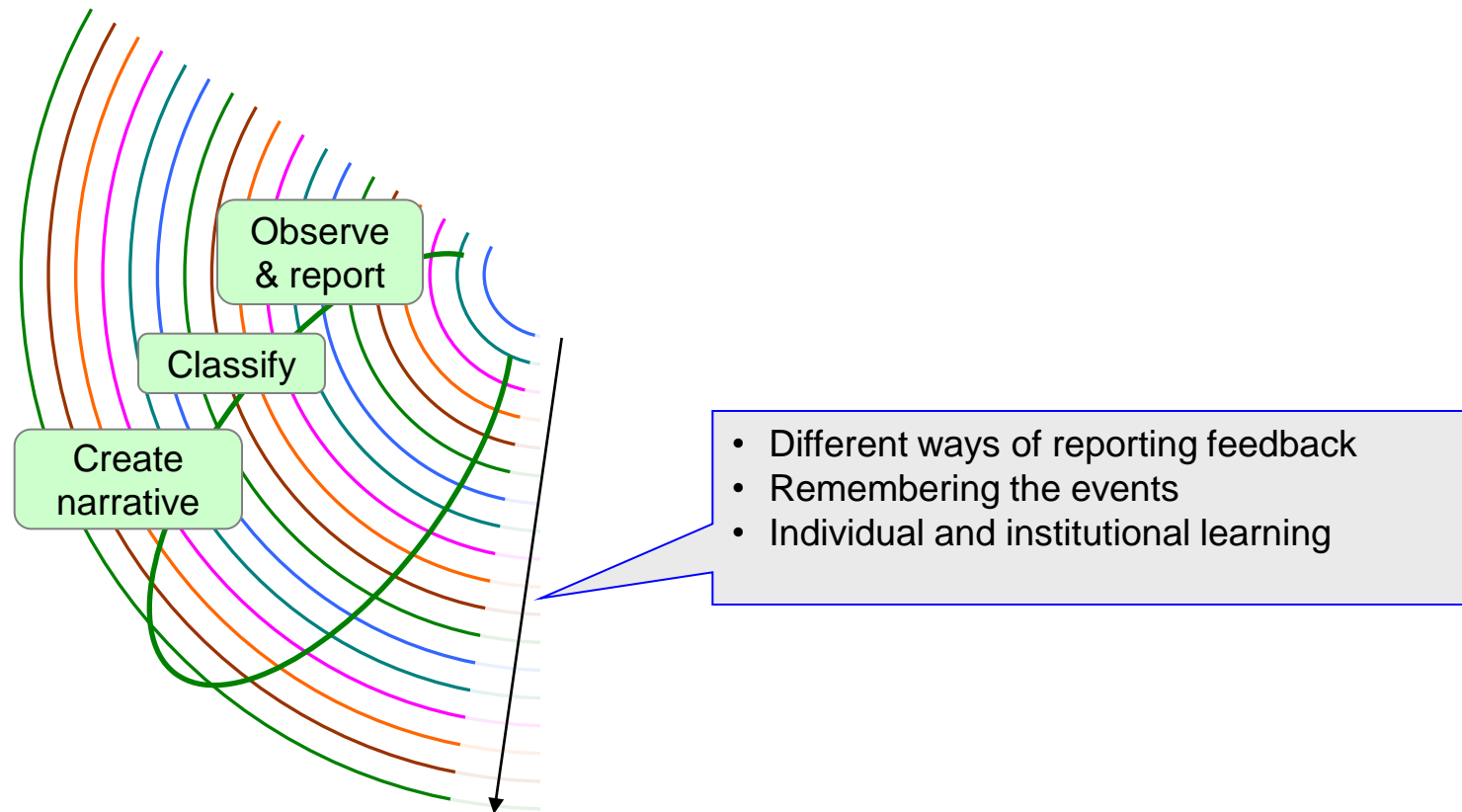


Four types of knowledge

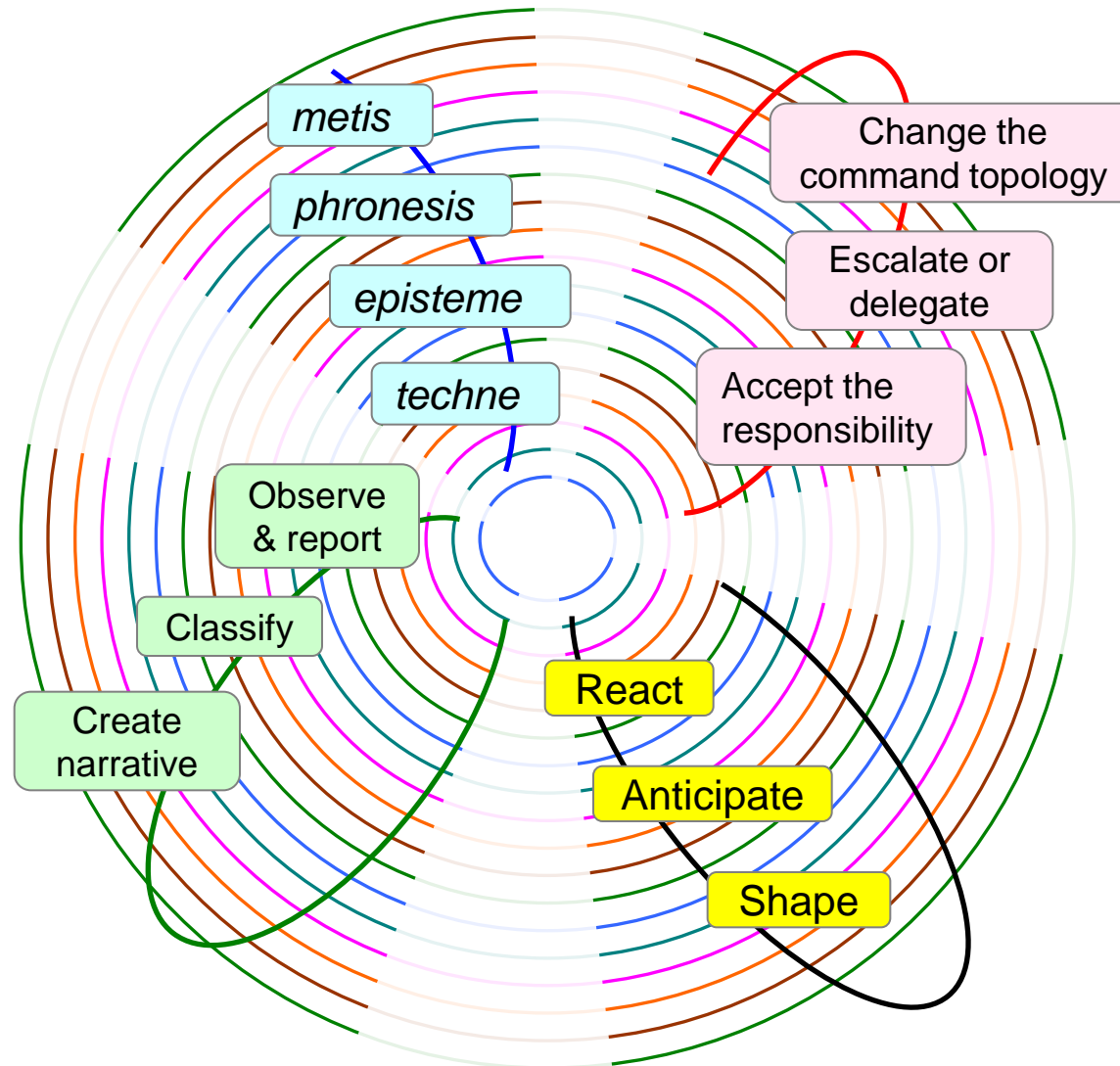
	Type of decision-role			
	Operator (e.g. driver) Practical	Decision-taker (e.g. Battle Cmdr) Tactical	Decision-maker (e.g. 2* Cmdr) Operational	Shaper (e.g. 4* CINC) Strategic
Conjectural knowledge and cunning learnt thro complexity (<i>metis</i>)	Understanding modus operandi and decoys, etc of adversarial operators.	Plan robustness and ability to consider 'cunning' plans.	Ability to defer decisions and to balance all aspects of rules and freedoms.	How to shape relationships for natural flow of complex operations.
Experiential knowledge learnt through felt experience (<i>phronesis</i>)	Self reflection & creation of new options or actions – being resourceful.	Create effective options outside usual course of action options.	Understanding of situation as a whole – as felt OK to over-ride principles.	Feel for when to re-generate or remove policy boundaries.
Teachable knowledge (<i>episteme</i>)	Learning how to cope with equipment break-down.	Operational and situational knowledge (e.g. ORBATs and geography).	Knowledge of own capability & organisation: constraints and restraints.	Knowledge of others' key strengths and weaknesses (power balance).
Technical skills and practices (<i>techne</i>)	Skills & refresh of practical tasks.	Estimate processes and CoA selection.	People skills for appropriate delegation of decision rights.	Mechanisms for setting policy (e.g. veto, rules of engagement).

- Different ways of applying expertise and knowledge

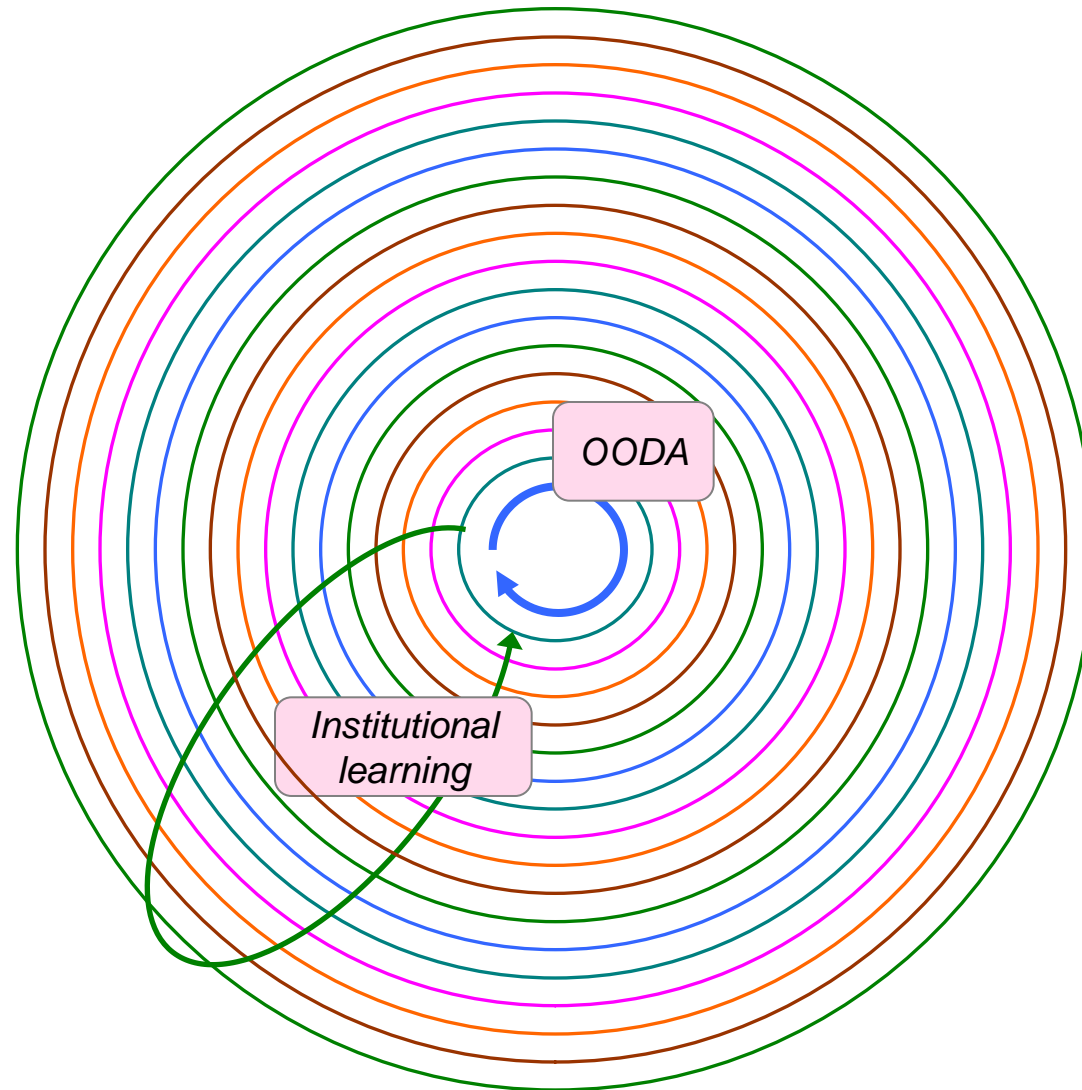
2. Time, reporting, remembering and learning



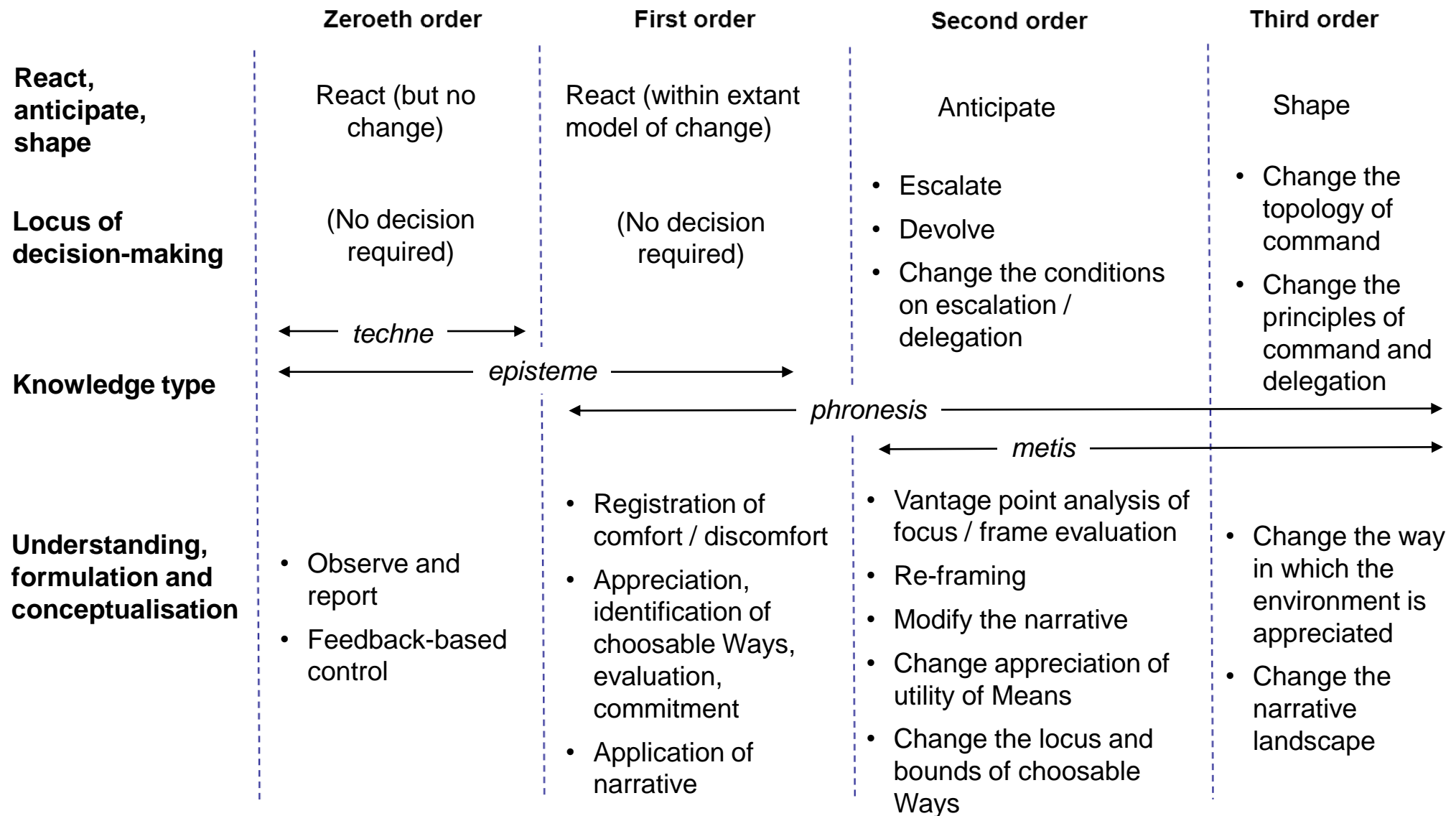
2. Forms of time relate to orders of agility



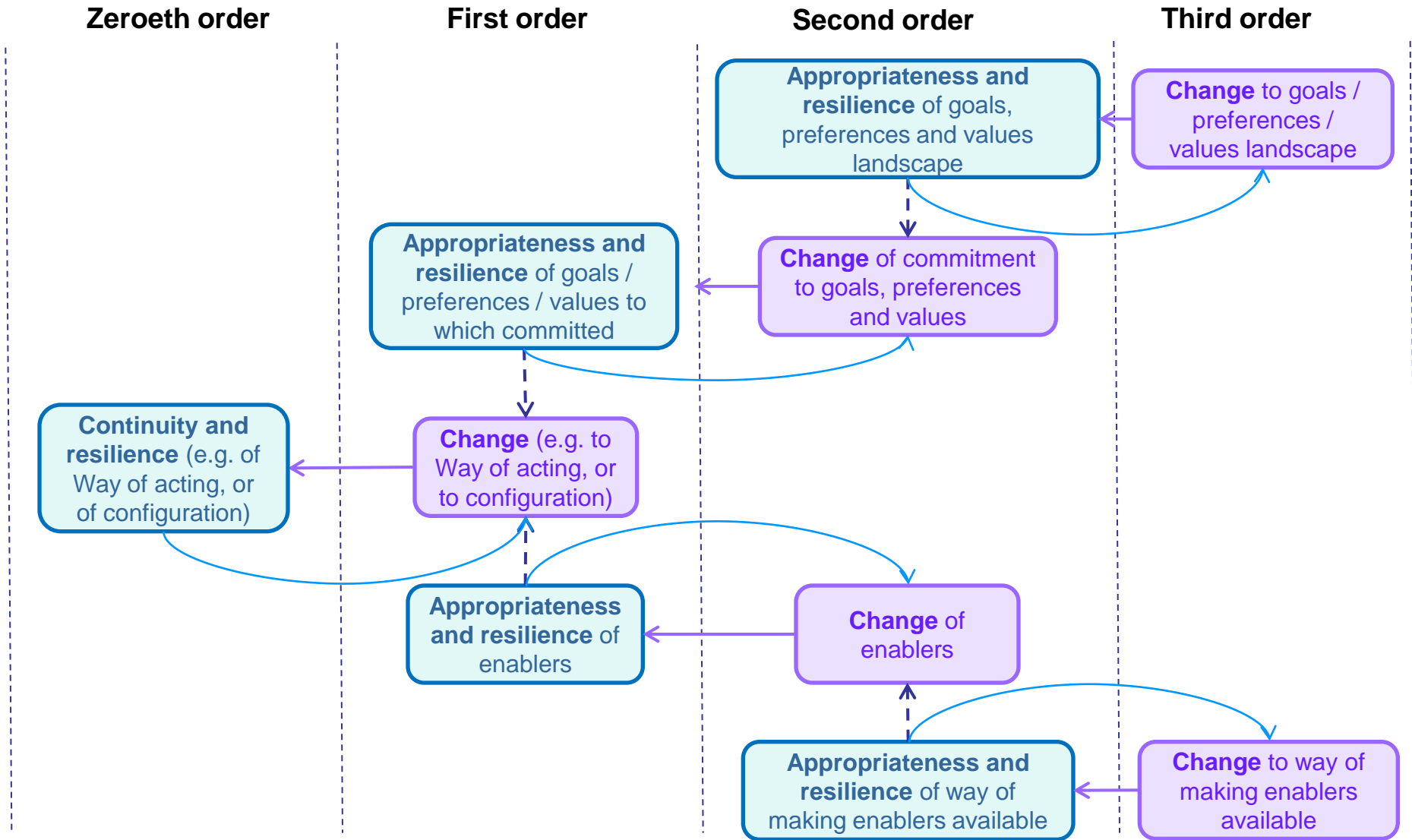
2. Forms of time leading to orders of agility



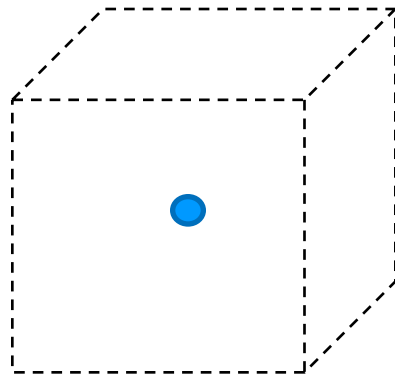
3. Orders of agility



3. Continuity and variety



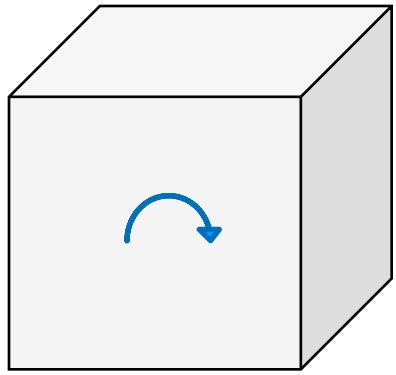
3. Decision spaces - making and taking decisions



Operating

Zeroeth order

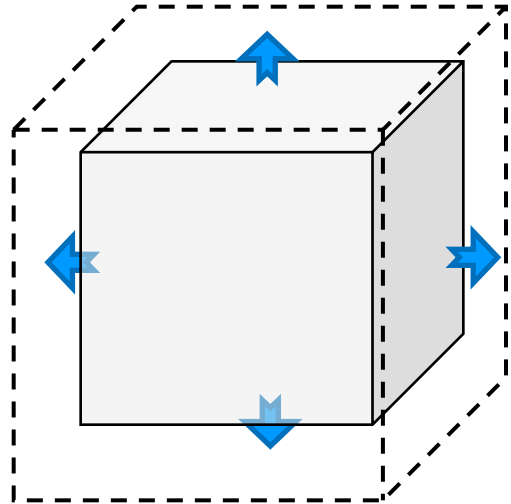
Maintain the existing solution



Decision-taking

First order

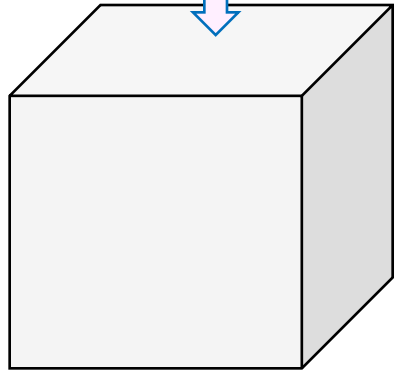
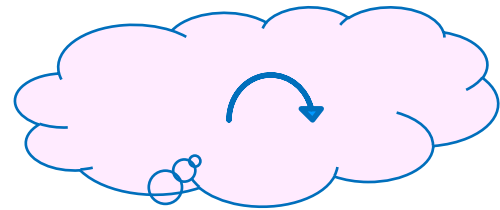
Find a new solution within the box



Decision-making

Second order

Modify the box

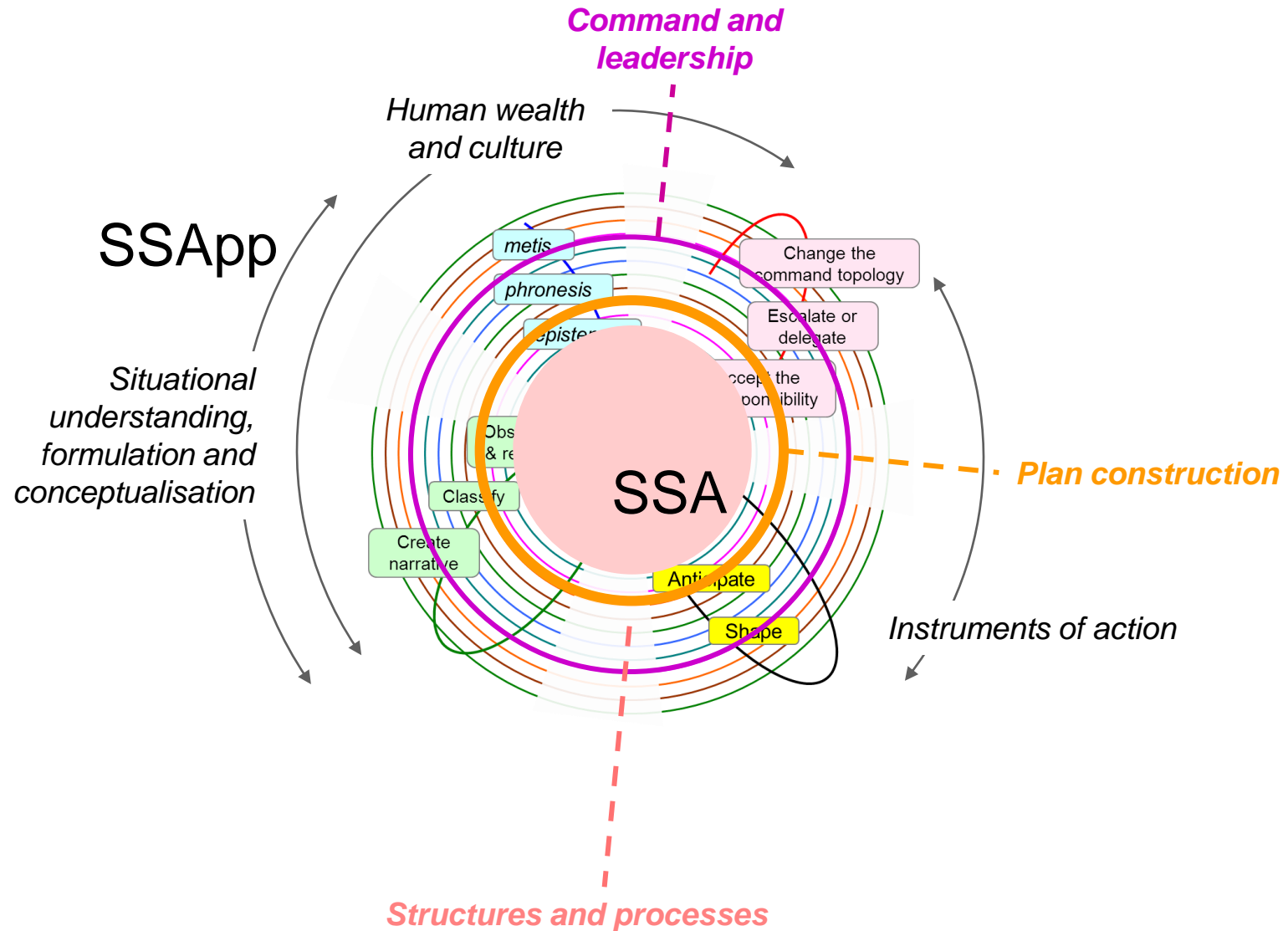


Decision-shaping

Third order

Change the system which generates the box

4. Shared situation awareness and appreciation



5. Summary

- C2 agility cannot be related to (or measured against) a single form of time derived from classical mechanics
 - rich and diverse forms of time being exercised
 - some important concepts of C2 agility – particularly those associated with mental agility and learning – which can only be properly measured using forms of time other than the *chronos* of sequential, clock-tick time
 - The earlier recognition of different forms of time at work in relation to C2 agility can be broadened to recognise different orders of agility
 - different exhibitions of agility (involving the physical, computational, cognitive, social and political facets of the C2 organization) can now be related to different orders of agility
 - This has given rise to a model of organizational decision making taking place on a two-dimensional grid formed from the orders of agility and ‘ways of viewing’
 - various forms of message/information passing taking place within such a grid and acting to inhibit or enable the different forms of exercise of agility

