



# NATO Code of Best Practice (COBP) for C2 Assessment

## Human and Organizational Factors



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# Report Documentation Page

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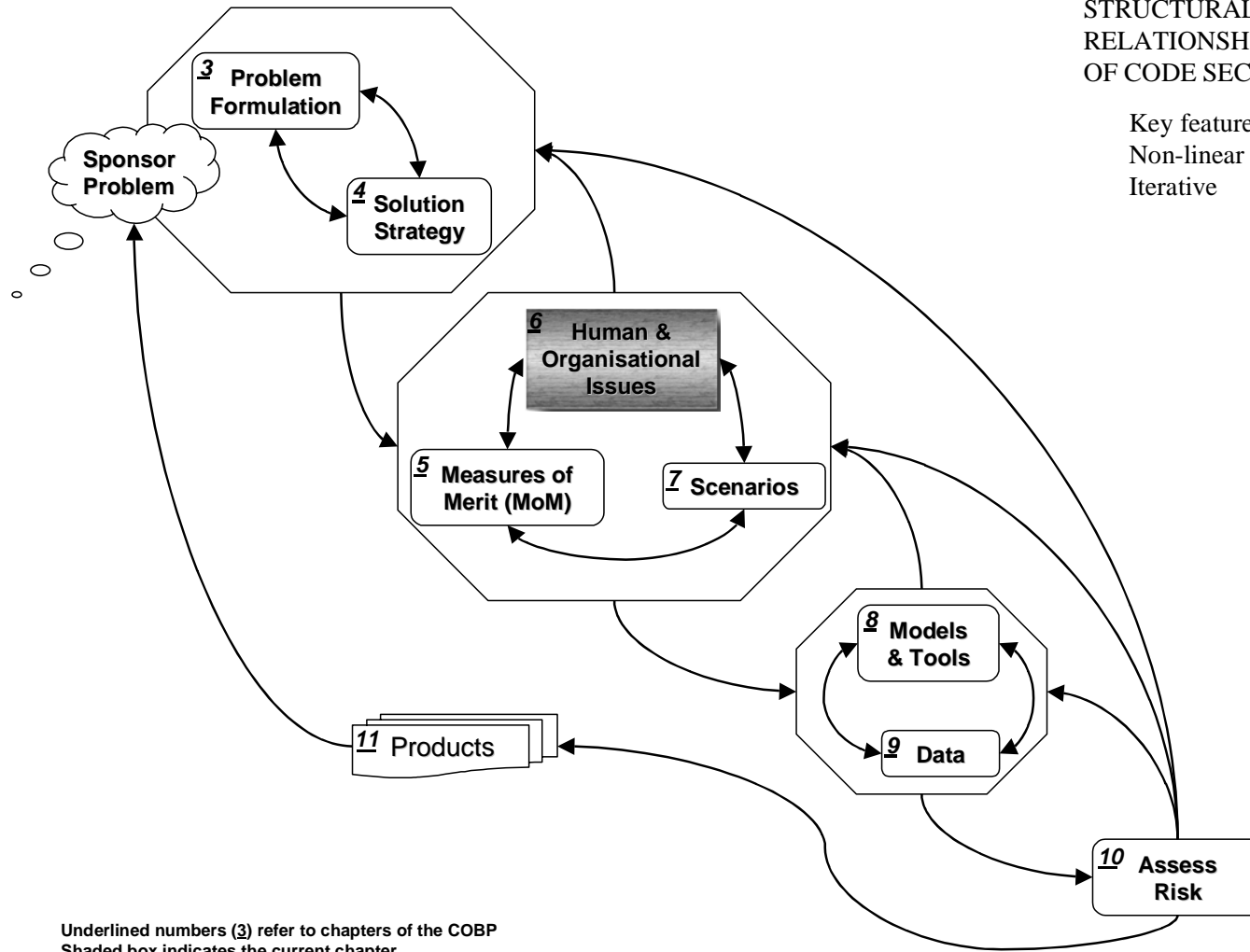
# Human and Organizational Factors

- C2 is distinguished by the human dimension;
- Maximizing the likelihood of mission accomplishment demands a C2 system characterized by efficient interaction between humans, organization, and technology;
- Human and organizational issues are central to structuring C2 problems and therefore need to be considered from the very beginning of a study in an iterative manner.

# Human and Organisational Factors

## STRUCTURAL RELATIONSHIPS OF CODE SECTIONS

Key features:  
Non-linear  
Iterative



# Key Considerations

- Addressing human and organisational issues adds complexity
- Relevance of human and organisational factors for the C2 assessment problem
- Availability of empirical evidence and human science expertise
- Parametric treatment of factors versus explicit modelling of human behaviour



# Human Factor Categories

- Human behaviour
- Decision making behaviour
- Command style

# Human Behaviour

- Human performance factors
  - psycho-physiological (stress, fatigue, hunger)
  - ergonomic/external factors limiting performance
- Social interactions among individuals and groups
  - psychological processes
  - background (cultural, educational, religious)
  - social and work competence and experience

# Decision Making Behaviour

- Type of decision
  - simple (automatable: decision rules or algorithms)
  - contingent (accounting for value added by information about operational environment )
  - complex (involving fundamental changes when no doctrinal guidance exists)
- Cognitive factors (complexity of issues, perception of environment)
- Capacity of commanders and other decision makers (training and experience)

# Command Style

- Attributes of commander
  - background (training, operational experience)
  - leadership (motivational capability, moral integrity)
  - risk attitude
- Organisational style
  - decomposition, hierarchic
  - holistic, centralised,
- Command philosophy
  - mission-oriented versus order-oriented
  - analytic versus holistic



# Human Behaviour and OOTW

- Human behaviour is more critical
  - tactical-level of decisions may have strategic consequences (media presence)
- Multitude of parties and groups
  - (para)military, political/ethnic/religious groups, amorphous groupings, aid organisations (IO,NGO)
  - diverging interests, different behavioural patterns
- Perceptions of military actions more important than their physical effects



# Organisational Factors

- Structure of organisation
- Functional responsibility
- Operational capacity



# Structure of Organisation

- Number of command echelons
- Span of control for command nodes
- Linkage of nodes
  - hierarchical, spokes of a wheel, multi-connected, networked
  - permanent versus transitory relationships
  - formal versus informal relationships



# Functional Responsibility

- Distribution of responsibility
  - location of functional activities (e.g., intelligence, logistics, CIMIC)
  - distribution of authority
  - functional specificity (warfare domain task forces for combined operations) versus integrated capabilities (mission tailored task forces for joint operations)
- Degree of ambiguity in command relationships



# Operational Capacity

- Personnel (background, training, experience)
- Communication systems and architectures
- Information processing systems and architectures
- Operational field experience



## C2 Analysis Problem in OOTW

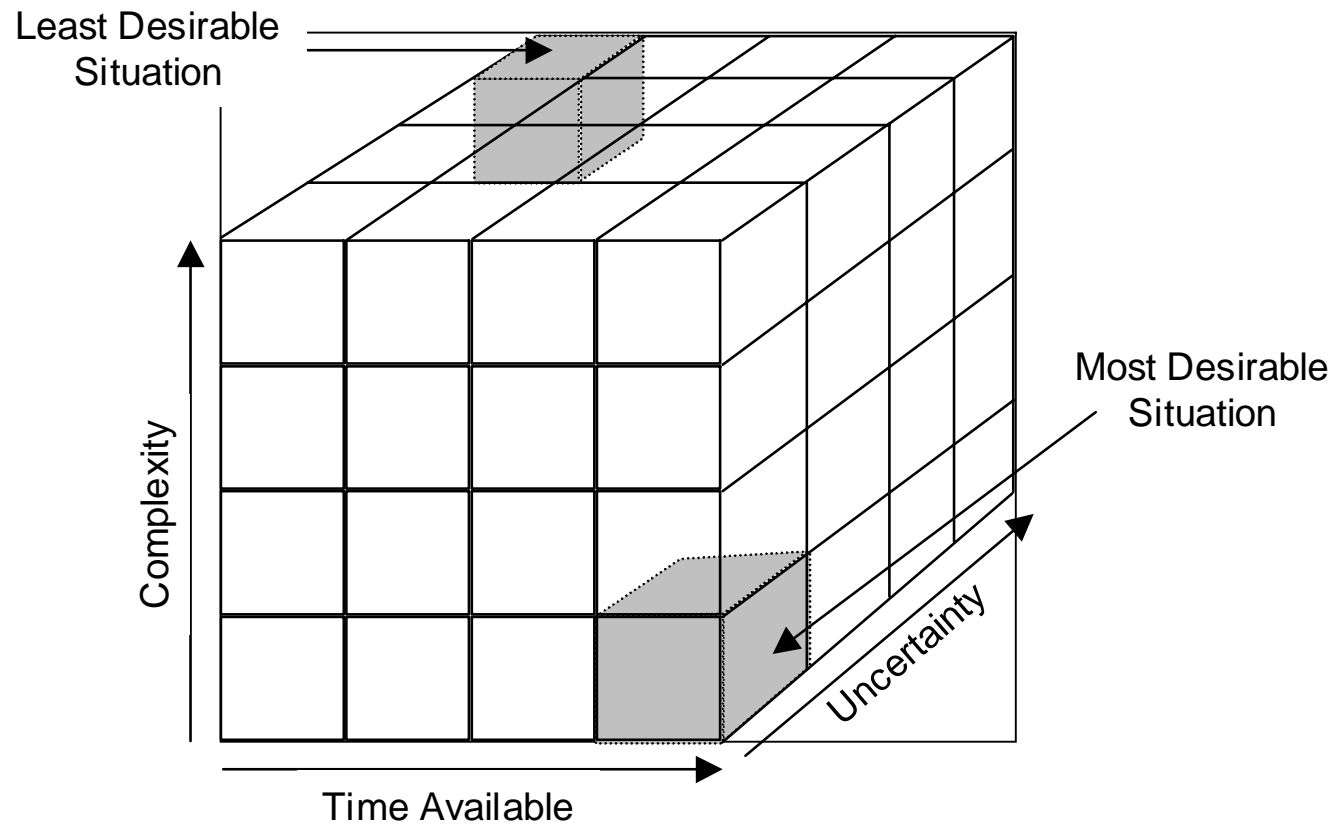
- C2 in OOTW: complex interactions of tightly coupled human, organisational, and technological factors and processes;
- Analyst is faced with a (theoretically) large set of complex options;
- Analysis problem: management of complexity to arrive at efficient options;
- Approach: Integrated Analysis



# Integrated Analysis

- Integrated Analysis implies iterative testing of hypotheses on related sets of key parameters
  - starting with few aggregated parameters that cover the theoretically possible range of options;
  - narrowing, in each iteration, the bounds for subsequent testing of related sets of ever more disaggregated parameters;
- Hypotheses must include decision strategy options in the operational context of analysis.

# Decision-making Drivers





# Operational Decision Strategy

- Objective: staying ahead of situational change (pro-active decisions);
- Dilemma: shortening C2 loop (OODA) means greater situational uncertainty (risk of counter-productive decisions);
- Decision strategy: buying sufficient time for OODA through short-term (delaying) actions;
- Sufficiency criterion: maximise probability of mission success.



## Human Issues in the Assessment

- Addressing human and organisational issues requires interdisciplinary analysis involving different scientific cultures;
- Project leader must be aware of the current state of the disciplines involved;
- Good personal and working relationship with customer of analysis are essential;
- Early working relationships with subjects of, or affected by, assessment are important.

## Human and Organisational Issues

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