

Annex E – C2 VARIABLE DEFINITIONS

Variable Name	Variable Description
Achievement Orientation: Culture	A cultural dimension, characterized by the degree to which values such as assertiveness, the acquisition of money and material goods, and competition prevail in a society [derived from the original concept “Masculinity”].
Achievement Orientation: Personal Values	An individual attitude, characterized by the degree to which an individual values assertiveness, the acquisition of money and material goods, and competition [derived from the original concept “Masculinity”].
Action Accuracy	Extent to which actions executed are directed to the intended purpose.
Action Appropriateness	Extent to which actions executed are the appropriate ones to achieve the intended purpose.
Action Completeness	Extent to which actions executed encompass the full scope of the plan or order.
Action Consistency	Extent to which actions executed are consistent with actions in an earlier timeframe.
Action Correctness	Extent to which actions executed without error.
Action Efficiency	Extent to which actions executed are efficient in the use of resources.
Action Precision	Extent to which actions executed are precisely related to the intended purpose.
Action Synchronization	Purposeful arrangement of actions in time, space and purpose. JCS Dictionary of Military and Associated Terms
Action Timeliness	Extent to which actions are executed at the time required by the plan or order (in the case of self-synchronising forces the plan could be an ad hoc arrangement between peers).
Adaptive Behaviour	Any process whereby behaviour or subjective experience alters to fit in with a changed environment or circumstances or in response to social pressure (Colman, A.M. (2003). A Dictionary of Psychology. Oxford, NY: Oxford University Press).
Adaptiveness	The ability to change work processes and the ability to change the organization. (Power to the Edge, 2003)
Agreeableness	Personality trait characterized by being pleasant, characterized by kindness, generosity, warmth, unselfishness and trust (Colman, A.M. (2001). A Dictionary of Psychology. Oxford, NY: Oxford University Press).
Alertness	State characterized by the preparedness to recognize and to react to stimuli. “Continuous Alertness”: Selective recognition of and reaction to continuously or frequently occurring stimuli. “Vigilance”: Recognition of and reaction to irregularly and infrequently occurring events.
Allocation of Decision Rights	The distribution of choices related to a particular topic under a set of circumstances or conditions disseminated to the international community, a society, an enterprise, or an organization.
Ambiguity of Situation	Extent to which information does not lend itself to interpretation.
Ambiguity Tolerance	The degree to which one is able to tolerate lack of clarity in a situation or in a stimulus.

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Variable Name	Variable Description
Anxiety	The affective state characterized by apprehension, dread, distress, uneasiness (Reber, A.S. (1995). The Penguin Dictionary of Psychology. 2 nd ed. London: Penguin Books.
Authentication	A security measure designed to protect a communications system against acceptance of a fraudulent transmission or simulation by establishing the validity of a transmission, message, or originator. JCS Dictionary of Military and Associated Terms
Awareness Accuracy	Appropriateness of precision of awareness for a particular use NCO CF
Awareness Completeness	Extent to which awareness necessary form understanding is obtained. NCO CF Awareness completeness includes awareness about capabilities, environment, forces, intentions, and mission.
Awareness Consistency	Extent to which awareness is consistent with relevant awareness at an earlier time period NCO CF
Awareness Correctness	Extent to which awareness is consistent with ground truth NCO CF
Awareness Currency	Time lag of awareness NCO CF
Awareness Precision	Level of granularity of awareness NCO CF
Awareness Relevance	Extent to which awareness obtained is related to task at hand NCO CF
Awareness Timeliness	Extent to which currency of awareness is suitable to its use NCO CF
Awareness Uncertainty	Subjective assessment of awareness uncertainty NCO CF
Blood Sugar Level	Level of blood glucose. High blood sugar leads to hyperglycaemia, low blood sugar leads to hypoglycaemia. cancerweb.ncl.ac.uk
C2 Doctrine	Fundamental principles by which the military forces or elements thereof guide their actions in the command and control arena in support of national objectives. Based on US JCS Pub 1 definition of doctrine
Cognitive Capacity	The amount of information the human brain can hold and process within a given time (Oxford Dictionary of Economics. Original reference: H. A. Simon, Models of bounded rationality, Volume 2, Cambridge, Massachusetts (MIT Press, 1982)).
Cognitive Complexity	The degree to which a person is able to differentiate cognitive elements, and the degree to which these elements can be integrated or related to each other (e.g., Fransella & Bannister, 1977; Schroder et al., 1967; Wyer, 1964; citation (p. 782) from Van Hiel, A. & Mervielde, I. (2003). The Measurement of Cognitive Complexity and Its Relationship With Political Extremism. Political Psychology, 24 (4), 781-801.
Cognitive Flexibility	An individual's willingness and ability to change in their understanding of a situation when confronted with new or contradictory information.
Cohesion	The degree to which team members are attracted to each other and motivated to stay in the team.
Collaboration Capacity	Team members' ability to working together towards a common purpose.

Variable Name	Variable Description
Collaboration Completeness	Includes collaboration about capabilities, environment, forces, intentions, and mission.
Collaboration Mechanism	System that enables collaboration.
Collaboration Participants	The ability of team members to work together towards a common purpose.
Co-Located / Distributed	Distributed: Placed or positioned so as to be properly apportioned over or throughout an area. Co-located: placed together; especially: to place (two or more units) close together so as to share common facilities. (Websters)
Command Speed	Time lag between an occasion for action and the implementation of action or a decision not to respond. Headquarters Effectiveness Assessment Tool User's Manual. McLean, VA: Defense Systems, Inc., 1984. Note: Speed of Decision is a synonym for this variable.
Commanders Decision Style	A commander's habitual approach to affecting a choice and then acting on that choice. The way in which operational objectives are implemented in a systematic and efficient way (Connor, P.E. & Becker, B.W. (2003). Personal Value Systems and Decision-Making Styles of Public Managers. Public Personnel Management, 32 (1), 155-180).
Commanders Leadership Behaviour	Authoritative vs. cooperative, task orientated vs. relationship orientated, transactional vs. transformational.
Commanders Myers-Briggs Style	The commander's ability to communicate data and interacts with others. The Myers-Briggs Typology: Attitudes: "Extraversion vs. Introversion"; Perception: "Sensing Perception vs. Intuitive Perception"; Judgment: "Thinking Judgment vs. Feeling Judgment"; Orientation to the outer world: "Judging vs. Perceiving". Sensing Perception refers to the tendency to rely on perceptions observable by way of the senses. Intuitive perception refers to the tendency to perceive possibilities, meanings, and relationships by way of insight. Thinking judgment: Persons who are primarily oriented toward thinking may develop characteristics associated with principles of justice and fairness, criticality, and an orientation to time that is concerned with connections from the past through the present and toward the future. Feeling judgment: Persons who are primarily oriented toward thinking may develop characteristics associated with principles of justice and fairness, criticality, and an orientation to time that is concerned with connections from the past through the present and toward the future. Perceptive attitude: In the perceptive attitude, a person is attuned to incoming information. Judging attitude: In the judging attitude, a person is concerned with making decisions, seeking closure, planning operations, or organizing activities. (Myers, I.B. & McCaulley, M.H. (1992). Manual: A Guide to the Development and Use of the Myers-Briggs Type Indicator. Palo Alto: Consulting Psychologists Press).
Commanders Risk Propensity	A commander's natural inclination or preference for being exposed to possible harm or loss. (Websters)
Commitment/Loyalty	The degree to which an individual identifies with their organization or group and its goals and wishes to maintain membership with the organization/group.

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Variable Name	Variable Description
Communication System Characteristics	Communication System Characteristics: The distinguishing traits, reach, reliability, robustness, richness of a communication system. Webster's Ninth Collegiate Dictionary and Understanding Information Age Warfare
Communications Interoperability	The condition achieved among communications-electronic systems or items of communications-electronic equipment when information or services can be exchanged directly and satisfactorily between them and/or their users. US JCS Pub 1 Dictionary of Military and Associated Terms
Complexity of Situation	The degree to which the relevant information is complicated (involves many factors), and involves intricate linkages; and is therefore difficult to understand.
Complicated-ness	A system with a large number of degrees of freedom. (Moffat)
Confidentiality	Information or material that requires protection from unauthorized disclosure which could reasonably be expected to cause damage to the national security. JCS Dictionary of Military and Associated Terms
Conformity	“Conformity” as a human attribute: Tendency to allow ones opinions, attitudes, actions and perceptions to be affected by prevailing opinions, attitudes, actions and perceptions. “Behavioural conformity” is the tendency to attempt to act in ways consistent with the majority; “attitudinal conformity” is the tendency to change an attitude or belief in response to pressure from others, which may but need not result in behavioural change; “conformity as a personality trait is the tendency for an underlying characteristic of an individuals personality to change under the influence of behavioural or attitudinal conformity” (Reber, A.S. (1995). The Penguin Dictionary of Psychology. 2 nd ed. London: Penguin Books). “Conformity” in general: “Correspondence in form, manner, or character. An index of conformity ranging from none (0) to perfect (1.0)” Webster’s Third International Dictionary, Unabridged. Springfield, MA: Merriam Webster, Inc.: 1986.
Conscientiousness	Personality trait characterized by organization, thoroughness, reliability, practicality; absence of carelessness, negligence, unreliability.
Consistency of Command Intent	A concise expression of the purpose of the operation and the desired end state that serves as the initial impetus for the planning process. It may also include the commander’s assessment of the adversary commander’s intent and an assessment of where and how much risk is acceptable during the operation. (JP 5-00.1)
Constraint Enforcement	To force by imposed stricture, restriction, or limitation Webster’s Third International Dictionary, Unabridged. Springfield, MA: Merriam Webster, Inc.: 1986.
Constraint Setting	Establishing constraints. The state of being checked, restricted, or compelled to avoid or perform some action. Merriam-Webster, Inc.: 1986.
Continuity of Interactions	An uninterrupted succession or flow mutual or reciprocal actions or influences. Webster’s Dictionary and the American Heritage Dictionary
Cooperability	The ability to engage in co-operative behaviour in a team, e.g. by information sharing and mutual support.

Variable Name	Variable Description
Cooperative Behaviour	The practice of people or greater entities working in common with commonly agreed-upon goals and possibly methods, instead of working separately in competition. URL: http://en.wikipedia.org/wiki/Cooperation [10.03.2005]
Criticality	The significance and importance of decisions. NCO CF Version 2.0
Data Interoperability	A level of interoperability in which data from one system can be used directly as data in another system, without translation or transformation.
Databases	Collection of information organized in a structured fashion.
Decision Accuracy	Appropriateness of precision of decision (plan, directives) for a particular use. NCO CF
Decision Completeness	Extent to which relevant decisions encompass the necessary: depth: range of actions and contingencies included, breadth: range of force elements included, time: range of time horizons included. NCO CF
Decision Congruence	Extent to which decisions taken at different times or different locations are consistent with one another.
Decision Consistency	Extent to which decisions are internally consistent with prior understanding and decisions. NCO CF
Decision Correctness	Extent to which a decision is consistent with ground truth. NCO CF
Decision Currency	Time taken to make a decision (start time – external signal). NCO CF
Decision Participants	The number of individuals or perspectives taking part in a decision.
Decision Precision	Level of granularity of decisions. NCO CF
Decision Relevance	Extent to which a decision is significant to the task at hand. NCO CF
Decision Speed	The time required to make a decision after the need for a decision is recognized.
Decision Style	A habitual (albeit learned) approach to effecting a choice and then acting on that choice. “Analytical decision style”: Logical, abstract thinking, performance is achieved by analysis, planning, forecasting. “Behavioural decision style”: Supporting behaviour and empathy, performance comes from focusing on people and their needs. “Conceptual decision style”: Broad, creative thinking, performance is achieved by exploring new options, forming new strategies, being creative, and taking risks. “Directive decision style”: Focused thinking and production of rapid results, implementation of operational objectives in a systematic and efficient way (Connor, P.E. & Becker, B.W. (2003). Personal Value Systems and Decision-Making Styles of Public Managers. Public Personnel Management, 32 (1), 155-180).
Decision Timeliness	Extent to which currency of decision making is suitable to its use. NCO CF
Decision Type	Extent to which a decision is based on rules, algorithms or human judgment.
Decision Uncertainty	Process of generating command intent. NATO COBP for C2 Assessment.
Development of Intent	Process of generating command intent. NATO COBP for C2 Assessment.
Direct Sensing	Direct sensing takes place when humans experience an object or event in the physical domain with one of their senses (such as seeing, hearing, or smelling), and the sensing registers directly in the cognitive domain. Understanding Information Age Warfare.
Discovery	Intellectual undertakings to support learning new concepts and developing new hypotheses. Code of Best Practice for Experimentation.

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Variable Name	Variable Description
Distances	The space between adjacent men, animals, vehicles, or units in a formation measured from front to rear. The space between known reference points or a ground observer and a target, measured in meters (artillery), in yards (naval gunfire), or in units specified by the observer. (JCS Pub 1)
Dynamics Across Purpose (Command)	Extent to which the fundamental dimensions of command approach change across purpose.
Dynamics Across Purpose (Control)	Extent to which the fundamental dimensions of control approach change across purpose.
Dynamics Across Time (Command)	Extent to which the fundamental dimensions of command approach change across time.
Dynamics Across Time (Control)	Extent to which the fundamental dimensions of control approach change across time.
Economic Situation	Status with regards to the production and allocation of goods and services and their impact on the material well-being of human beings. William Outhwaite and Tom Bottomore, eds. The Blackwell Dictionary of Twentieth-Century Thought. Cambridge, MA: Blackwell, 1993.
Education	Capacity to learn, A program of instruction of a specified kind or level. The American Heritage Dictionary of the English Language, Fourth Edition. 2004
Emotional Stability	A personality trait representing the opposite of the trait “neuroticism” (which is itself characterized by nervousness, tenseness, moodiness, tempermentality).
Enemy Forces	Personnel, material and supporting capabilities of the adversary.
Equivocality of Situation	Extent to which information can be interpreted in different ways.
Experience of Personnel	Active participation in events or activities, leading to the accumulation of knowledge or skill of individuals whose aim is to accomplish the mission.
Extent of Shared Information	Proportion of understanding in common across force entities, within and across communities of interest (Communities of Interest). Proportion of force entities which share information item
Extra-Role Behaviour	Behaviour characterized by activities that are essential for organizational effectiveness but are discretionary in nature (e.g., acting courteously, helping others (Moorman, Niehoff & Organ, 1993; Organ, 1988); citation from Becker, T.E. & Kernan, M.C. (2003). Matching Commitment to Supervisors and Organizations to In-Role and Extra-Role Performance. Human Performance, 16 (4), 327-348).
Extraversion	An individual’s style to interact with the environment, characterized by awareness and reliance on the environment for stimulation and guidance, an action-oriented, sometimes impulsive way of meeting life, frankness, ease of communication and sociability. The opposite is introversion: characterized by enjoyment of solitude and privacy, as well as interest in the clarity of concepts and ideas, reliance on enduring concepts more than on transitory external events, and a thoughtful, contemplative detachment (Myers, I.B. & McCaulley, M.H. (1992). Manual: A Guide to the Development and Use of the Myers-Briggs Type Indicator. Palo Alto: Consulting Psychologists Press).

Variable Name	Variable Description
Field Independence	A cognitive style characterized by the propensity to differentiate perceptual and other experiences from their contexts; the extent to which one's perceptions are independent from cues in the environment (the "field"). The opposite is "field dependence".
Financial Resources	Pecuniary means; funds; money, or any property that can be converted into supplies; available means or capabilities of any kind.
Flexibility	The ability to employ multiple ways to succeed and the capacity to move seamlessly between them. (Power to the Edge, 2003)
Force Effectiveness	The extent to which military missions are accomplished. NATO COBP for C2 Assessment
Force Will	The disposition or inclination of a force or an element of a force to action Webster's Third International Dictionary, Unabridged. Springfield, MA: Merriam-Webster, Inc.: 1986.
Frequency of Interactions	Rate of interactions over time. Note: Time scale depends on level of modelling e.g. tactical seconds/minutes/hours... Enterprise...months/years.
Friendly Forces	Personnel, material and supporting capabilities of the friendly entities.
Fusion	The ability of systems (manual, automated, autonomous) to support the integration of data/information to support intelligence inference. Levels are defined in Antony's Principles of Data Fusion Automation. In intelligence usage, the process of examining all sources of intelligence and information to derive a complete assessment of activity. DoD Dictionary of Military and Associated Terms
General Intelligence	The ability to learn or understand or to deal with new or trying situations; the ability to apply knowledge to manipulate one's environment or to think abstractly.
Goal Consistency	Consistency among purposes for which resources are expended in order to achieve a desired objective or end-state. Derived from Merriam Webster
Group Pressure	The degree to which team members exercise force on each other to act in a unique way.
Hardness	Team members' familiarity with each other and knowledge of other team members' styles and capabilities, based on their repeated or continued interaction in the team (e.g. J. Holzworth, Meta-Analysis of Team Performance Accuracy and Shared Situational Awareness in SCUDHunt Experiments, C4ISR Decision Support Center/ ThoughtLink Inc., Cantata Court, Vienna, VA, 2002; W. Perry, J. Boob & D. Signori, Exploring Information Superiority, RAND 2004).
History	A chronological record of significant events, often including an explanation of their causes Webster's Third International Dictionary, Unabridged. Springfield, MA: Merriam-Webster, Inc.: 1986.
Homogeneity	A homogeneous team shows consistency in a specified attributes, e.g. attitudes, values and beliefs, among the team members (e.g. Handy, 1989).
Human Semantic Interoperability	Consistency of meaning across individuals.

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Impulsivity	An individual's tendency to respond spontaneously without deliberation, especially in situations of uncertainty. The opposite of impulsivity is "reflectivity": An individual's tendency to consider and deliberate over alternative solutions to a problem. (Colman, A.M. (2001). A Dictionary of Psychology. Oxford, NY: Oxford University Press).
Indirect Sensing	To become aware of; perceive by involving intermediate or intervening parts or pathways The American Heritage Dictionary of the English Language, Fourth Edition
Individual Task Efficiency	The degree to which an individual exhibits a high ratio of output to input in performing a task. American Heritage Dictionary. 2000
Individual Task Quality	How well an individual performs a task. (American Heritage Dictionary 2000)
Individualism: Culture	A cultural dimension, characterized by the degree to which it is common in a society to perceive oneself independent from others and their attitudes and opinions. This meaning can reflect either a positive connotation, in that one who displays it stands above/outside social and peer pressure, or a negative connotation, in the sense of being uncooperative and uncaring. (Reber, A.S., The Penguin Dictionary of Psychology. 2 nd ed. London: Penguin Books, 1995). The opposite is "collectivism".
Individualism: Personal Values	An individual attitude, characterized by the degree to which an individual perceives himself/herself independent from others and their attitudes and opinions. This meaning can reflect either a positive connotation, in that one who displays it stands above/outside social and peer pressure, or a negative connotation, in the sense of being uncooperative and uncaring. (Reber, A.S., The Penguin Dictionary of Psychology. 2 nd ed. London: Penguin Books, 1995). The opposite is "collectivism".
Information Accuracy	Degree to which information quality matches what is needed.
Information Completeness	Extent to which information relevant to ground truth is collected.
Information Consistency	Extent to which information is consistent with prior information and consistent across sources.
Information Correctness	Extent to which information is consistent with ground truth.
Information Currency	Difference between the current point in time and the time the information was made available.
Information Distribution	The way information flows and is disseminated in the "real world" because of informal relationships, linkages and sources.
Information Networks	Various points on the information spectrum from data to knowledge that are linked in a complex, interconnected group or system. Understanding Information Age Warfare and the American Heritage Dictionary.
Information Pedigree	Extent to which you know where information came from.
Information Precision	Level of measurement detail of information item.

Variable Name	Variable Description
Information Relevance	Extent to which information quality is relevant to the task at hand.
Information Richness	Measures that address the quality of the information content used by actors. (Understanding Information Age Warfare)
Information Service Characteristics	Describes a range of processing services support than might be provided to the force for continuance of operations. Each alternative builds on the previous.
Information Sharability	The extent to which an element of information is in a form or format understandable by all nodes in a network.
Information Source Characteristics	The traits of tools used to develop facts, data, or instructions in any form or medium. All information sources are reporters. They have the following characteristics: False alarm rate; coverage; persistence; spectrum (sensitivity); phenomenology DOD Dictionary of Military and Associated Terms
Information Timeliness	Extent to which currency of information is suitable to its use.
Information Transfer Approach	Movement and distribution of information.
Information Uncertainty	A fundamental attribute of war. Uncertainty pervades the battlefield in the form of unknowns about the enemy, the surroundings, and our own forces. (Power to the Edge)
Innovation	The ability to do new things and the ability to do old things in new ways. (Power to the Edge, 2003)
Integrity	The quality or condition of being whole or undivided; completeness. The American Heritage Dictionary of the English Language, Fourth Edition
Intent Motivation	The forces responsible for the initiation, persistence, direction, and vigour of goal-directed behaviour to reach an objective. (Colman, A.M. (2001). A Dictionary of Psychology. Oxford, NY: Oxford University Press).
Interaction Quality	Usefulness of actively sharing information, and developing awareness, understanding and/or making decisions (developing plans) in a collaborative fashion. (NCO CF Version 2.0 and the American Heritage Dictionary)
Interdependence	Degree to which team members have to rely on each other.
Intra Group Conflict	Disagreement among team members. \“task conflict\”: different viewpoints, ideas and opinions, and/or disagreements about task content; \“relationship conflict\”: interpersonal incompatibilities, including tension, animosity, annoyance. relationship conflicts are affectly loaden.

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Variable Name	Variable Description
Leadership Behaviour	<p>The extent to which a leader inspires subordinates to transcend their own self-interests and has a profound and extraordinary effect on followers.</p> <p>Authoritative: The extent to which a leader makes decisions without consulting with his/her subordinates. Democratic: The extent to which a leader consults with his/her subordinates to reach a shared decision. The extent to which a leader emphasizes interpersonal relations, taking a personal interest in the needs of subordinates and accepting individual differences among members. The extent to which the underlying value basis is characterized by the assumption that a leader should emphasize technical or task aspects of the job in order to achieve goals. The extent to which a leader guides and motivates his/her subordinates in the direction of established goals by clarifying role and task requirements.</p>
Leadership Culture	<p>Authoritative: The extent to which the underlying value basis is characterized by the assumption that a leader should make decisions without consulting with his/her subordinates. Democratic: The extent to which the underlying value basis is characterized by the assumption that a leader should consult with his/her subordinates to reach a shared decision. The extent to which the underlying value basis is characterized by the assumption that a leader should emphasize interpersonal relations, take a personal interest in the needs of subordinates and accept individual differences among members. The extent to which the underlying value basis is characterized by the assumption that a leader should emphasize technical or task aspects of the job in order to achieve goals. The extent to which the underlying value basis is characterized by the assumption that a leader should guide and motivate his/her subordinates in the direction of established goals by clarifying role and task requirements. The extent to which the underlying value basis is characterized by the assumption that a leader should inspire subordinates to transcend their own self-interests.</p>
Lethal Effectors	Resources which are designed and employed to inflict casualties on an opponent.
Levelling	<p>The tendency to smooth over the unusual, irregular or novel aspects of a situation or an event such that details are glossed over and what ends up in memory is a homogeneous, less incongruous version than what was objectively presented. The reverse tendency is “sharpening”: the tendency to (over)emphasize and accentuate details rather than to smooth over unusual, irregular or novel aspects of a situation or an event (Reber, A.S. (1995). <i>The Penguin Dictionary of Psychology</i>. 2nd ed. London: Penguin Books).</p>
Likelihood of Success	Probability of mission accomplishment.
Locus of Control	<p>The perceived source of control over one’s behaviour; “internal Locus of Control”: the belief to have control over one’s own destinies; “external Locus of Control”: the belief that control over one’s destinies resides outside oneself, e.g. chance, luck, fate, or the actions of powerful others (Colman, A.M. (2001). <i>A Dictionary of Psychology</i>. Oxford, NY: Oxford University Press).</p>

Variable Name	Variable Description
Measures of C2 Effectiveness	Measures of impact of the state of the command and control. Example: force planning.
Memory Performance	In empirical research, “memory performance” is most often operationalized as the quality (correctness and extent) of recall of cognitive contents previously encoded. “Memory” in general is defined as “the psychological function of preserving information, involving the processes of encoding, storage, and retrieval”. Memory can be differentiated into “long-term memory for information stored for more than a few seconds, short-term memory for temporary storage of information for briefer periods, and sensory memory (including the iconic store) for very brief storage of visual and possibly other sensory information” (Colman, A.M. (2003), A Dictionary of Psychology. Oxford: Oxford University Press.
Mental Models Confidence	The degree of subjective confidence that the mental model in use is appropriate to situation and task.
Mental Models Relevance	The extent to which mental model in use is appropriate to the actual situation and task at hand.
Mental Models Richness	The breadth and depth of the range of models that can be brought to bear on the situation.
Mission Effectiveness	Mission Effectiveness is the degree to which a force accomplishes its assigned military mission. Examples of specific components are described in Maxwell, 1998.
Mobility	Extent to which a sensor is able to move from place to place while retaining its ability to fulfil its primary mission.
Mood	Any relatively short-lived, low-intensity emotional state (Reber, A.S. (1995). The Penguin Dictionary of Psychology. 2 nd ed. London: Penguin Books).
Motivation	A driving force or forces responsible for the initiation, persistence, direction, and vigour of goal-directed behaviour. It includes biological drives (e.g. hunger, thirst, sex, self-preservation) and social forms of motivation, e.g. need for achievement, need for affiliation. (Colman, A.M. (2001). A Dictionary of Psychology. Oxford, NY: Oxford University Press).
Motor Skill	A skill required for proper usage of skeletal muscles. Besides muscles, these depend upon the proper functioning of the brain, skeleton, joints, and nervous system. Most motor skills are learned in early childhood. Disabilities can affect motor skills.

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Myers-Briggs Style	The manner in which one learns and communicates data and interacts with others. The Myers-Briggs Typology: Attitudes: “Extraversion vs. Introversion”; Perception: “Sensing Perception vs. Intuitive Perception”; Judgment: “Thinking Judgment vs. Feeling Judgment”; Orientation to the outer world: “Judging vs. Perceiving”. Sensing Perception refers to the tendency to rely on perceptions observable by way of the senses. Intuitive perception refers to the tendency to perceive possibilities, meanings, and relationships by way of insight. Thinking judgment: Persons who are primarily oriented toward thinking may develop characteristics associated with principles of justice and fairness, criticality, and an orientation to time that is concerned with connections from the past through the present and toward the future. Feeling judgment: Persons who are primarily oriented toward thinking may develop characteristics associated with principles of justice and fairness, criticality, and an orientation to time that is concerned with connections from the past through the present and toward the future. Perceptive attitude: In the perceptive attitude, a person is attuned to incoming information. Judging attitude: In the judging attitude, a person is concerned with making decisions, seeking closure, planning operations, or organizing activities. (Myers, I.B. & McCaulley, M.H. (1992). Manual: A Guide to the Development and Use of the Myers-Briggs Type Indicator. Palo Alto: Consulting Psychologists Press).
Needs	A general course of action or behavioural tendency (Colman, Oxford Dictionary of Psychology, 2003).
Network Assurance	The degree of confidence in the ability of force entities to have good connectivity. This includes the security, privacy, and integrity of the network and its contents. (From NCO Conceptual Framework v. 1.0)
Network Availability	The percentage of time all authorized users have access to the network. This is necessary if current information is to be shared and if the user community is to develop trust and confidence in using the information in the system. Understanding Information Age Warfare
Network Reach	The number and variety of people, work stations, or organizations that can share information. (Understanding Information Age Warfare)
Network Redundancy	Multiple ways to get at the same information or to get from point A to point B in a network. This helps in the availability of the system, where if part of the network goes down, then we do not have to stop the information flow because there are other means of accessing or getting to a certain part of the network.
Network Reliability	An attribute of any network that consistently produces the same results, preferably meeting or exceeding its specifications. (The Free Online Dictionary of Computing, Denis Howe)
Network Richness	The quality and breadth of the information found in the network. (Understanding Information Age Warfare)
Network Sustainability	The ability to maintain the necessary level and duration of operational activity to achieve military objectives (JP 1-02). In a network context, sustainability is a function of the ability to manage, maintain, and restore the network and network components.

Variable Name	Variable Description
Neutral Forces	In combat and combat support operations, an identity applied to a track whose characteristics, behaviour, origin, or nationality indicate that it is neither supporting nor opposing friendly forces. (JCS Pub 1)
Non-Lethal Effectors	Resources designed and employed for self protection and to control ambiguous situations with inflicting casualties.
Non-Repudiation	The inability to avoid responsibility for inserting data, information, or knowledge into the information domain. One of the elements of information assurance.
Norm Strength	Degree to which teams are expected to comply to a norm.
Number of Personnel	Quantity of personnel available to accomplish the mission.
Nurturing: Culture	A cultural dimension, characterized by the degree to which relationships are valued, and sensitivity and concern for the welfare of others is shown in a society [derived from the original concept “Femininity”].
Nurturing: Personal Values	An individual attitude, characterized by the degree to which an individual values relationships, and shows sensitivity and concern for the welfare of others [derived from the original concept “Femininity”].
Open / Closed	Refers to the willingness and ability of an individual to change their understanding of a situation when confronted with new or contradictory information.
Open Sources	Information available from the public domain.
Openness to Experience	A personality trait characterized by imagination, curiosity, and creativity; the opposite of shallowness and imperceptiveness (Colman, A.M. (2001). <i>A Dictionary of Psychology</i> . Oxford, NY: Oxford University Press).
Other Physical Abilities	Physical abilities including body coordination, balance and stamina. “body coordination”: the ability to coordinate the simultaneous actions of different parts of the body. “balance”: the ability to maintain equilibrium despite forces pulling off balance. “stamina”: the ability to continue maximum effort requiring prolonged effort over time.
Patterns of Interaction Enabled	Establishing standards or protocols that facilitate the appropriate level and quality of communication, information exchange and collaboration required for success.
Patterns of Interaction Not Allowed	To disallow certain types of communication, information exchange and collaboration.
Perceived Likelihood of Success	An awareness of the probability if a mission will be accomplished.
Perceptual Filters	Bias in an individual’s capacity to identify or focus on relevant information
Persistence	The action or fact of existing for a long time or continuously Webster’s Third International Dictionary, Unabridged. Springfield, MA: Merriam-Webster, Inc.: 1986.
Personnel Resources	Those individuals available in either a military or civilian capacity to accomplish the assigned mission.
Physical Flexibility	Extent flexibility: the ability to move the trunk and back muscles as far as possible. “dynamic flexibility”: the ability to make rapid, repeated flexing movements.

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Variable Name	Variable Description
Physical Strength	“Dynamic strength”: the ability to exert muscular force repeatedly or continuously over time. “trunk strength”: the ability to exert muscular strength using the trunk (particularly abdominal muscles). “static strength”: the ability to exert force against external objects. “explosive strength”: the ability to expend a maximum of energy in one or a series of explosive acts.
Plan Accuracy	Degree that the plan matches the Commander’s intent.
Plan Completeness	Degree that the plan does not have missing components.
Plan Consistency	Degree of logical coherence of the plan, including elements that cut across functions or echelons.
Plan Correctness	Degree the plan is error free.
Plan Currency	The time lag of issuance of the plan.
Plan Feasibility	Degree to which the plan is practicable.
Plan Precision	Level of granularity of elements of the plan.
Plan Relevance	Degree that the plan is pertinent to the Commander’s Intent.
Plan Timeliness	Extent to which the plan currency is suitable for use. A suitable length of time used to develop a plan after recognition of the need for a plan.
Plan Uncertainty	Extent to which is it not able to know or predict ground truth based on the plan.
Planning Speed	Time required to develop a plan after recognition of the need for a plan.
Policy Effectiveness	The degree of success in influencing and determining decisions, actions, and other matters as related to societal and policy outcomes. NATO COBP for C2 Assessment and the American Heritage Dictionary of the English Language, Fourth Edition
Political Situation	The element of the battlespace environment that has to do with the distribution of authority and power between competing individuals or groups outside the military arena. (Websters)
Position-Based Power	Position-based power refers to an individual’s (legal) power based on their holding a position of authority.
Power Distance: Culture	A cultural dimension, characterized by the degree to which it is accepted in a society that power is distributed unequally.
Power Distance: Personal Values	An individual attitude, characterized by the degree to which an individual accepts that power is distributed unequally.
Predictability Type	The characteristic being likely to be foreseen and/or countered effectively. Power to the Edge. 2003.
Privacy	A system in which no one except authorized users has access and each user’s access is appropriate for their roles and responsibilities. When that cannot be avoided (e.g., long haul communications are required), the system itself must be designed to keep out unauthorized users and to detect, with a high degree of confidence, efforts to penetrate the system.

Variable Name	Variable Description
Problem Solving Style	An individual's problem solving style may be either divergent or convergent. Convergent thinking: bringing together or synthesizing of information and knowledge focused on a solution to a problem; characterized by synthesis of information and analytical, deductive thinking; logical, consciously controlled, reality-oriented. Divergent thinking: diverging of ideas to encompass a variety of relevant aspects, fluent production of a variety of novel ideas relevant to the problem (Reber, A.S. (1995). The Penguin Dictionary of Psychology. 2 nd ed. London: Penguin Books).
Quality of Command Intent	Usefulness of aims or purposes. American Heritage Dictionary. 2000.
Quality of Communication of Command Intent	The ability and extent able to communicate aims or purposes.
Quality of Communications Equipment	The subjective assessment of the quality of available tangible forces, material and other assets.
Quality of Computing Equipment	The subjective assessment of the quality of computing hardware and associated equipment.
Quality of Consumable Equipment	The subjective assessment of the quality of expendable assets (ammunition, food, fuel, etc.) available to the force.
Quality of Facilities	The subjective assessment of the quality of real property entities consisting of one or more of the following: a building, a structure, a utility system, pavement, and underlying land.
Quality of Interactions	Usefulness of actively sharing information, and developing awareness, understanding and/or making decisions (developing plans) in a collaborative fashion. (NCO CF Version 2.0 and the American Heritage Dictionary)
Quality of Non-Consumable Equipment	The subjective assessment of the quality of non-expendable assets (tanks, trucks, tents, etc.) available to a force.
Quality of Personnel	The subjective assessment of the quality of those individuals available in either a military or civilian capacity to accomplish the assigned mission.
Quality of Sets of Unit Equipment	The subjective assessment of the quality of tangible elements of a mission capability package available to a unit.
Quality of Visualization	The ability to capture the full richness of the insights, particularly risk and uncertainty (e.g., depicts the distribution rather than just the statistical) that are derived in assessments. (NATO COBP)
Quantity of Communications Equipment	The number of available tangible forces, materiel and other assets.
Quantity of Computing Equipment	The number of computing hardware and associated equipment.

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Variable Name	Variable Description
Quantity of Consumable Equipment	The number of expendable assets (ammunition, food, fuel, etc.) available to the force.
Quantity of Facilities	The number of real property entities consisting of one or more of the following: a building, a structure, a utility system, pavement, and underlying land.
Quantity of Non-Consumable Equipment	The number of non-expendable assets (tanks, trucks, tents, etc.) available to a force.
Quantity of Sets of Unit Equipment	The number of tangible elements of a mission capability package available to a unit.
Relation to Environment	An individual's style of interacting with their social environment, the ends of the continuum being "Desire to control the environment" and "Willingness to adapt to the environment".
Repression	The disposition to react to threatening stimuli or ideas by blocking and denial. The opposite is Sensitization: The Disposition to react by approaching, facilitating, and increasing vigilance, i.e. by confronting the threatening stimuli directly).
Resilience	The ability to recover from or adjust to misfortune, damage, or a destabilizing perturbation in the environment. (Power to the Edge, 2003, p. 128)
Resolution	A measurement of the smallest detail that can be distinguished by a sensor system under specific conditions.
Response Speed	"Response speed is measured by a response initiation time and a movement time. Initiation time refers to the speed with which a participant reacts to a cue and may be akin to simple RT [reaction time]; another processing speed measure. Movement time is the speed with which a person completes a response following response initiation, [...] resulting in a combined decision and movement time response." Luciano, M., Wright, M.J., Geffen, G.M., Geffen, L.B., Smith, G.A., Martin, N.G. (2004). Multivariate genetic analysis of cognitive abilities in an adolescent twin sample. Australian Journal of Psychology, 56 (2), 79-88.
Responsiveness	The ability to react to a change in the environment in a timely manner. (Power to the Edge, 2003, p. 128)
Restriction of Decision Rights	The restriction of choices related to a particular topic under a set of circumstances or conditions.
Restriction on Information Distribution	To restrict the way information flows and is disseminated in the "real world".
Risk Propensity	An individual's natural inclination or preference for being exposed to possible harm or loss. (Websters Dictionary)
Risk Taking	The degree to which an individual willingly undertakes actions that involve a significant degree of risk; the action of undertaking actions that involve a significant degree of risk. Reber, A.S. (1995). The Penguin Dictionary of Psychology. 2 nd ed. London: Penguin Books.

Variable Name	Variable Description
Robustness	The ability to maintain effectiveness across a range of tasks, situations, and conditions. (Power to the Edge, 2003, p. 128)
Role Clarity	The unambiguous knowledge of what tasks/functions one (and the other team members) has (have) been assigned and is (are) expected to accomplish/fulfil.
Role of Emotion	The role emotion is assigned in the context of social interaction, ranging from “neutral interactions” versus “emotional interactions”. “Neutral interactions” refers to the assumption that it is not appropriate to express emotions in social interactions; “emotional interactions” refers to the assumption that it is appropriate to express emotions in social interactions.
Selectivity	The quality or state of being judicious and restrictive of choice. Webster’s Third International Dictionary, Unabridged. Springfield, MA: Merriam Webster, Inc.: 1986.
Self-Efficacy	The sense of one’s abilities to deal with particular sets of conditions or with a particular task.
Self-Esteem	An individual’s evaluation of himself/herself (ranges from “favourable” to “unfavourable”).
Self-Monitoring	The behaviour of self-observation and control of one’s expressive behaviour and self-presentation.
Sensor Coverage (Medium)	Origin of the sensor platform supporting indirect sensing e.g. land, UAV, satellite
Sensor Coverage (Spatial)	Sequence or range of values (e.g., frequency, optical, infrared) to which sensor exhibits in order to observe, analyze and report targets of interest.
Sensor Coverage (Spectrum)	Sequence or range of values (e.g., frequency, optical, infrared) to which sensor exhibits in order to observe, analyze and report targets of interest.
Sensor Persistence	Persistence is a compound attribute that addresses both the percentage of time an area is covered along different dimensions of the spectrum.
Shared Awareness Accuracy	Appropriateness of precision of shared awareness for a particular use.
Shared Awareness Completeness	Extent to which awareness necessary forms a complete shared understanding. NCO CF
Shared Awareness Consistency	Extent to which shared awareness is consistent within and across Col.
Shared Awareness Correctness	Extent to which shared awareness is consistent with ground truth.
Shared Awareness Currency	Time lag of shared awareness.
Shared Awareness Precision	Level of granularity of shared awareness.
Shared Awareness Relevance	Proportion of shared awareness that is related to the task at hand.
Shared Awareness Timeliness	Extent to which currency of shared awareness is suitable to its use.
Shared Awareness Uncertainty	Subjective assessment of confidence in shared awareness.

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Variable Name	Variable Description
Shared Information Accuracy	Appropriateness of precision of shared information for a particular use.
Shared Information Completeness	Extent to which relevant shared information is obtained.
Shared Information Consistency	Extent to which shared information is consistent within and across communities of Interest (CoI).
Shared Information Correctness	Extent to which shared information is consistent with ground truth.
Shared Information Currency	Time lag of shared information.
Shared Information Precision	Level of granularity of shared information.
Shared Information Relevance	Proportion of shared information that is related to task at hand.
Shared Information Timeliness	Extent to which currency of shared information is suitable to its use.
Shared Information Uncertainty	Subjective assessment of confidence in shared information.
Shared Understanding Accuracy	Appropriateness of precision of shared understanding for a particular use.
Shared Understanding Completeness	Extent to which relevant shared understanding is obtained.
Shared Understanding Consistency	Extent to which shared understanding is consistent within and across CoI.
Shared Understanding Correctness	Extent to which shared understanding is consistent with ground truth.
Shared Understanding Currency	Time lag of shared understanding.
Shared Understanding Precision	Level of granularity of shared understanding.
Shared Understanding Relevance	Proportion of shared understanding that is related to the task at hand.
Shared Understanding Timeliness	Extent to which currency of shared understanding is suitable to its use.
Shared Understanding Uncertainty	Subjective assessment of confidence in shared understanding.

Variable Name	Variable Description
Situational Familiarity	The characteristic of having encountered or seen, or having knowledge of a situation.
Sleep Deprivation	The condition of being deprived of sleep either under experimental or unusual real life conditions (as distinguished from being unable to sleep). cancerweb.ncl.ac.uk
Social Situation	The element of the battlespace environment that has to do with human society and its modes of organization outside the military arena. Deals with the distribution of wealth among the members of society. The American Heritage Dictionary of the English Language, Fourth Edition.
Source of Status	Cultural dimension, ranging from “Status through achievement” to “Status through traditional roles ranks”; deals with how people are judged, either by their deeds and accomplishments (status through achievement) or by predetermined status based on rank, age, etc. (status through traditional roles/ranks).
State of Mental Health	The state of well-being in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community (WHO, 2001).
State of Physical Health	The ability to cope with everyday activities, state of fitness and well-being, absence of illness. Characterised by homeostasis, i.e. a state of balance, with inputs and outputs of energy and matter in equilibrium (allowing for growth). Health also implies good prospects for continued survival.
Stress Level	Psychological and physical strain or tension generated by physical, emotional, social, economic, or occupational circumstances, events or experiences that are difficult to manage or endure (Colman, A.M. (2001). A Dictionary of Psychology. Oxford, NY: Oxford University Press).
Synchronization	The meaningful arrangement of things or effects in time and space. Understanding Information Age Warfare.
System Semantic Interoperability	Consistency of meaning across systems. Webster’s Third International Dictionary, Unabridged. Springfield, MA: Merriam-Webster, Inc.: 1986.
Task Competence	The degree to which the knowledge required to execute a specified task is held.
Task Currency/ Latency	Time lag of information.
Task Efficiency	The degree to which the performance of a task exhibits a high ratio of output to input. American Heritage Dictionary. 2000
Task Speed	The time an individual spends performing a task. American Heritage Dictionary. 2000.
Task Understanding	The degree to which what is required to execute a specified task is understood.
Team Scale	The number of individuals being part of a team.

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Variable Name	Variable Description
Team Shape	Basic category of organisational structure based on proportions of people in different subunits (functional types; Mintzberg H. (1979) The Structuring of Organisations, Prentice Hall) and on work specialization (the degree to which tasks in the team are subdivided into separate jobs), span of control (the number of subordinates a manager directs (can efficiently and effectively direct), centralization (the degree to which decision making is concentrated at a single point in the team), formalization (the degree to which jobs within the organization are standardized), and communication network complexity (proportion of accessible interpersonal communication links of the overall number of possible links between two individuals of a team).
Temporal Focus	Time into the future of an understanding or plan.
Temporal Orientation: Culture	A cultural dimension; Long-term orientation is characterized by the degree to which a society fosters virtues oriented towards future rewards. Short-term orientation is characterized by the degree to which a society fosters virtues related to the past and present (developed from Hofstede 2001, Culture's consequences. Comparing Values, Behaviors, Institutions and Organizations Across Nations, Thousand Oaks).
Temporal Orientation: Personal Values	An individual attitude; Long-term orientation is characterized by the degree to which an individual fosters virtues oriented towards future rewards. Short-term orientation is characterized by the degree to which an individual fosters virtues related to the past and present (developed from Hofstede 2001, Culture's consequences. Comparing Values, Behaviors, Institutions and Organizations Across Nations, Thousand Oaks).
Trafficability	Capability of terrain to bear traffic. It refers to the extent to which the terrain will permit continued movement of any or all types of traffic. (JCS Pub 1)
Training	Training is the process by which job-related skills and knowledge are taught. Building skill level. Mintzberg 79, p. 95
Trust	The extent to which an individual has decided to rely on others (subordinate, superior, peers) and to make himself/herself vulnerable to the consequences of their actions.
Trust Propensity	The extent to which an individual is basically willing to rely on others (subordinate, superior, peers) and to be vulnerable to the consequences of their actions.
Type I Error (False Alarm Rate)	The declaration of a positive identification when no target exists.
Type II Error	The declaration that no target exists when there is a target present.
Uncertainty Avoidance: Culture	A cultural dimension, characterized by the degree to which uncertain and ambiguous situations cause feelings of threat and the tendency to avoid them.
Uncertainty Avoidance: Personal Values	An individual attitude, characterized by the degree to which an individual feels threatened by uncertain and ambiguous situations and tries to avoid them.
Uncertainty of Situation	Not having sufficient information to describe a current state or to forecast future states, preferred outcomes, or the actions needed to achieve them. (Zach 1999)

Variable Name	Variable Description
Understanding Accuracy	Appropriateness of precision of Understanding for a particular use NCO CF
Understanding Completeness	Extent to which Understanding necessary from understanding is obtained NCO CF. A completeness of understanding includes understanding of capabilities, environment, forces, intentions, and mission.
Understanding Consistency	Extent to which Understanding is consistent with relevant awareness at an earlier time period NCO CF
Understanding Correctness	Extent to which understanding is consistent with ground truth NCO CF
Understanding Currency	Time lag of Understanding NCO CF
Understanding Precision	Level of granularity of Understanding NCO CF
Understanding Relevance	Extent to which Understanding obtained is related to task at hand NCO CF
Understanding Timeliness	Extent to which currency of Understanding is suitable to its use NCO CF
Understanding Uncertainty	Subjective assessment of Understanding uncertainty NCO CF
Weather (Atmospheric)	The state of the atmosphere with respect to heat or cold, wetness or dryness, calm or storm, clearness or cloudiness.
Weather (Space)	Activity on the surface of the sun, such as solar flares, that cause high levels of radiation in space. This radiation can come as plasma (particles) or electromagnetic radiation (light). NOAA Definition.
Willingness to Interact	The disposed or inclined willingness to act on others. The American Heritage Dictionary of the English Language, Fourth Edition

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