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IMPLEMENTING A COMPLEX ADAPTIVE INTELLIGENCE ENTERPRISE WITHIN CANSOFCOM

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IMPLEMENTING A COMPLEX ADAPTIVE INTELLIGENCE ENTERPRISE WITHIN CANSOFCOM

AIM

1. This paper was written at the request of CANSOFCOM (hereinafter the Command) given expressed challenges in implementing Stanley McChrystal's *Team of Teams* specific to their intelligence enterprise. The purpose of this paper, therefore, is to provide a theoretical framework for leadership and command over the intelligence function within an architecture that is increasingly complex and geographically distributed. This paper suggests that observed symptoms need to be carefully diagnosed, centralized control needs to be prudently balanced with de-centralized execution, and that effective leadership intervention is crucial to achieving a complex adaptive intelligence enterprise.

INTRODUCTION

2. Due to a number of external and internal factors to the CAF (see Annex B), organizations are increasingly moving towards split-based and reach-back intelligence architectures.¹ Given the Command's propensity for operating in volatile, uncertain, chaotic, and asymmetric (VUCA) environments, its requirement for geographically dispersed small missions requiring a high degree of precision and intelligence, and its relatively small size of highly skilled personnel (to include intelligence supporters), a distributed intelligence architecture was born out of necessity and enabled by robust classified information systems. While pressures will continue to drive intelligence support arrangements towards geographically distributed architectures, there are undoubtedly counter-arguments in favour of more robust close or intimate support intelligence (i.e. organic to the supported organization), especially if resources are not a limiting factor. Notwithstanding these counter-arguments, this paper assumes that a distributed intelligence architecture is desirable or necessary for any number of factors, and instead focuses on how best to achieve efficacy of the intelligence enterprise within this context.

3. Figure 1 depicts a notional intelligence architecture and is provided for reference. Complicating the intelligence support arrangements, all boxes represented in the figure are likely to be in separate geographical locations, thus the architecture would likely combine split-based and reach-back support arrangements depending on the exact

¹ For the purpose of this paper, *Split-based* is defined as an intelligence support arrangement that has elements under a unified command in two or more separate locations. Thus, looking at Figure 1, if the Special Operations Intelligence Centre (SOIC) were to have elements in theatre, and a team working remotely elsewhere, both under the command of the S2, this would be an example of a split-based architecture. *Reach-back* is defined as an intelligence support arrangement that relies on support from a dislocated organization under a separate command authority. Such support arrangements can be described as direct or general support meaning that the reach-back organization is either directly responsive to the intelligence requirements of the supported organization, or is responsive in-so-far as requests align with centrally set priorities respectively. Thus, looking at Figure 1, the Unit J2 staff may be providing reach-back support to the deployed S2. Likewise, central organizations within the Intelligence Community (IC) may be put in reach-back support to deployed elements such as the S2 and SOIC.

Command and Control (C2) and support relationships desired. Also note that intelligence support is asymmetrical between the notional missions (M1, M2, and M3) which is a function of the flexible and scalable nature of operations within the Command, and the resulting different intelligence support requirements between them. Such asymmetry adds additional complexity to the overall architecture. Thus, given a complex and geographically distributed intelligence architecture how does one ensure unity of purpose, resist organizational silos, and ensure efficacy of the intelligence function?

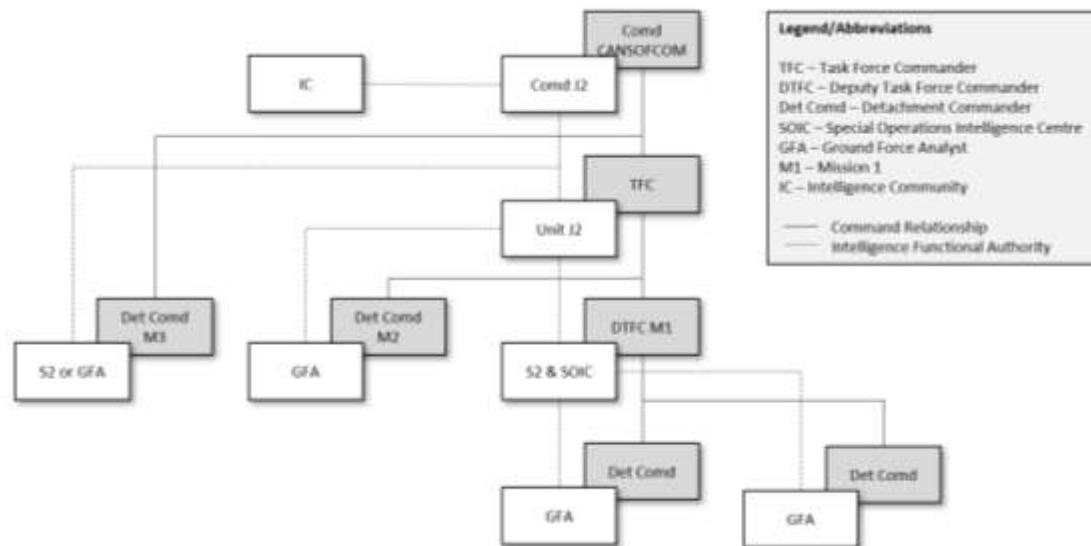


Figure 1 -- Notional Intelligence Architecture

DISCUSSION

Problem Definition

4. One of the critiques leveled against McChrystal's *Team of Teams* is that it overemphasises the role of technology in establishing 'shared consciousness' through the execution of large-scale virtual meetings and workflows.² Thus, McChrystal oversimplifies the arrival at shared consciousness, and posits that interconnectivity, flat communications, and high competencies are sufficient preconditions to establishing shared consciousness and effectiveness within a networked organization. This is not a fair critique, and such a reading of McChrystal neglects the limited scope of *Team of Teams* and its specific context. With respect to scope, McChrystal is focused on scaling up "...trust, common purpose, shared awareness, and the empowerment of individual members to act..." across organizational silos as distinct from traditional team building.³ Thus, before condemning McChrystal, one must first evaluate if the observed shortcomings are symptomatic of a failure of a Team of Teams, or simply the team. This

² Shared consciousness is the term given by McChrystal for a common, shared understanding of the problem space. The concept is analogous to Alberts' explanation of shared awareness and Pigeau and McCann's notion of shared knowledge referenced elsewhere.

³ Stanley McChrystal, *Team of Teams: New Rules of Engagement for a Complex World* (New York: Penguin, 2015), ix.

is especially true in the case of split-based intelligence organizations that force generate from within the same team. Figure 1 also highlights an important distinction between what McChrystal describes, and how C2 of the intelligence architecture is operationalized. While McChrystal was able to adapt *his organization* into a team of teams by eschewing the traditional hierarchies and trappings of command, the intelligence architecture shown in Figure 1 is a *derivative of the command* structure within the Command. Thus, while the intelligence leadership may wish to promote unity of intelligence effort, this may conflict with the different command priorities at various levels or locations. Thus, one must appreciate the distinction between functional authority and command authority and ask if absolute unity of intelligence effort is possible or desirable. That said, organizational silos, characterized by a lack of communication, transparency, or working at cross-purposes, is neither desirable nor indicative of an effective organization. The point here is that the frictions observed in the intelligence function may be symptomatic of larger issues within the overall C2 of the organization and careful diagnosis is required. Notwithstanding this nuanced understanding of *Team of Teams*, concepts such as common purpose, shared awareness, and cross-silo collaboration have benefits to ensuring the efficacy of the overall intelligence enterprise. Figure 2 shows the traditional hierarchy at left, which is similar (albeit simpler) to that depicted in Figure 1. The intent is to arrive at the right of Figure 2 (representing a hybrid model) whereby intelligence silos and functions collaborate towards a common purpose and in a complex adaptive way. The remainder of this paper will fill in the gaps left by *Team of Teams* using applicable command and leadership theory.

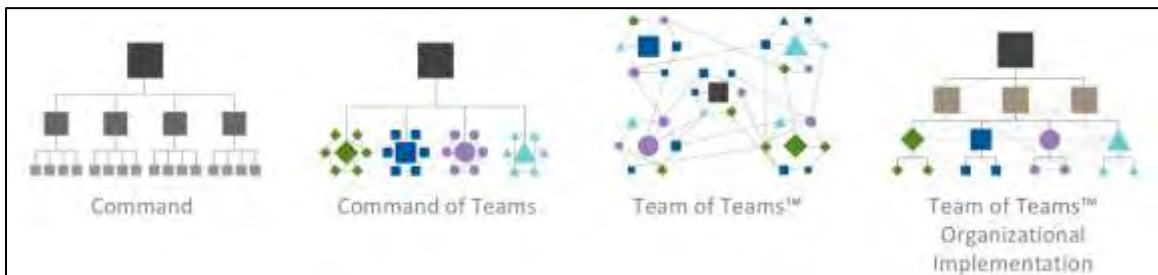


Figure 2 -- Team of Teams Organizational Structure⁴

Source: McChrystal Group, accessed Oct 23, 2019, <https://mcchrystalgroup.b-cdn.net/wp-content/uploads/2014/11/team-of-team-org-structure.png>.

⁴ “McChrystal Group,” McChrystal Group, accessed Oct 23, 2019, <https://mcchrystalgroup.b-cdn.net/wp-content/uploads/2014/11/team-of-team-org-structure.png>.

The Intelligence Architecture as an Edge Organization

5. In order to maximize the efficacy of a distributed intelligence architecture, the enterprise should approach and share the same characteristics of an edge organization, thus arriving at a complex adaptive system.⁵ That is, an organization with broad dissemination of information, highly networked connectivity between individuals and nodes, and a large degree of decentralized authority in how to define and address the intelligence problem (see Figure 3).⁶ While the first two characteristics are largely uncontentious, the last could be interpreted as undermining traditional notions of ‘direction’ in the intelligence cycle.⁷ While command direction should continue to focus intelligence priorities from a macro level, there must be a degree of mission command in allowing intelligence professionals the freedom to determine how best to refine and solve the intelligence problem. This is already practiced when most CAF commanders rely on their intelligence staff to recommend the intelligence problem and its component Priority Intelligence Requirements. While commanders (i.e. operators) have stepped back and allowed their subject matter experts freedom to address the intelligence problem, the same is not always true within an intelligence organization. Recognizing that problems are increasingly complex, intelligence leadership must accept that the person (or persons) in the best position to define the problem, and therefore recommend solutions, is the person with the best understanding of the subject matter -- which is not necessarily the leadership. Having commanded an All Source Intelligence Centre on operations, the author acknowledges that this imperative to ‘let go of the reigns’ is unnerving and counter intuitive to traditional notions of command; however, operating in a complex environment, requiring deep analytical understanding of any particular issue, requires just that. To be clear, this paper is not advocating in favour of *laissez-faire* leadership, instead the leader’s main effort must be aimed at ensuring that necessary conditions are in place to operationalize the intelligence architecture as an edge organization.

⁵ Mathew Peterson, “Organizational Leadership and the Intelligence Community: A New Paradigm,” *American Intelligence Journal* 27, no. 1 (2009): 55-60. In a 2009 article in the *American Intelligence Journal*, Matthew Peterson argues that changes in the US intelligence community (IC) following 9/11, that focused on structure and organization, missed at meaningful change by neglecting to change the dominant paradigm in favour of a complex adaptive system (CAS). While this paper shares his argument over the value of a complex adaptive IC, it views a top-down ‘paradigm change’ as insufficient and over simplistic to implement a CAS.

⁶ David S. Alberts, “Agility, Focus, and Convergence: The Future of Command and Control,” *The International C2 Journal* 1, no. 1 (2007): 8.

⁷ The intelligence cycle is comprised of the steps; direction, collection, processing, and dissemination. Note that the Government of Canada places an additional step of planning between direction and collection whereas the CAF subsumes planning as part of direction.

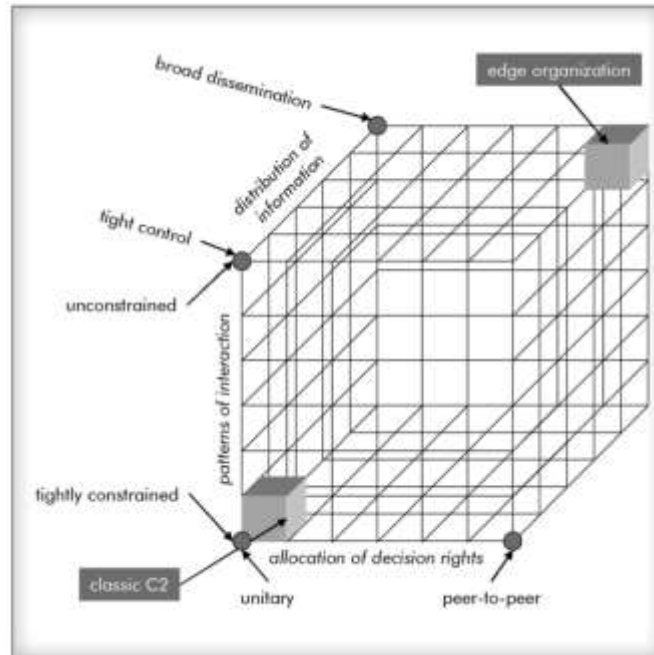


Figure 3 -- C2 Approach Space

Source: Alberts, "Agility, Focus, and Convergence...", 9.

The Fallacy of 'High-Performance' and the CAR Model

6. In his MDS dissertation, former CANSOFCOM J2, LCol Andy Brown, notes that in addition to technical competence, interpersonal skills, that promote positive group dynamics and effective teams, are "an absolute necessity" within a SOF organization. He goes on to argue that the Command should adopt refined screening and selection of intelligence personnel based on both intellectual and social competencies.⁸ While the ideal candidate would score high in all four dimensions of competency (defined by Pigeau and McCann as intellectual, physical, emotional, and social) applicants who do so are exceedingly rare -- especially when limiting the pool of candidates to in-service-selection.⁹ It is therefore understandable that the Command continues to emphasize intellectual competency in its selection standards at the expense of the other dimensions. The implication, however, is that high performing does not necessarily translate to high competency within the Competency, Authority, and Responsibility (CAR) model. Thus, the functional authority may choose to limit authority and responsibility of remote intelligence nodes to achieve a 'minimally balanced command' and remain within a 'Balanced Command Envelope (BCE)' as depicted in Figure 4.¹⁰ Such methods include

⁸ A.L. Brown, "Sharpening the Spear: Optimizing CANSOFCOM's Intelligence Function to Meet Approaching Challenges" (MDS diss., Canadian Forces College, 2013), 36.

⁹ Ross Pigeau and Carol McCann, "Re-conceptualizing Command and Control," *Canadian Military Journal* (Spring 2002): 58.

¹⁰ *Ibid.*, 58-61. Pigeau and McCann put forward the CAR model that contends that increased authority and responsibility are possible provided there is a commensurate level of competency. Responsibility and authority must be appropriately balanced, otherwise, one runs the risk of "dangerous command" or "ineffectual command" where authority is disproportionately high compared to responsibility and *vice versa*. If authority and responsibility are balanced, the command is either "maximal balanced" or

being more prescriptive with respect to increasingly centralized intelligence priorities or demanding specific reports and returns. While this may improve unity of purpose with respect to the intelligence function, such an approach must not restrict freedom of action in how best to address those priorities. Thus, such an approach is synonymous with centralized control and decentralized execution.

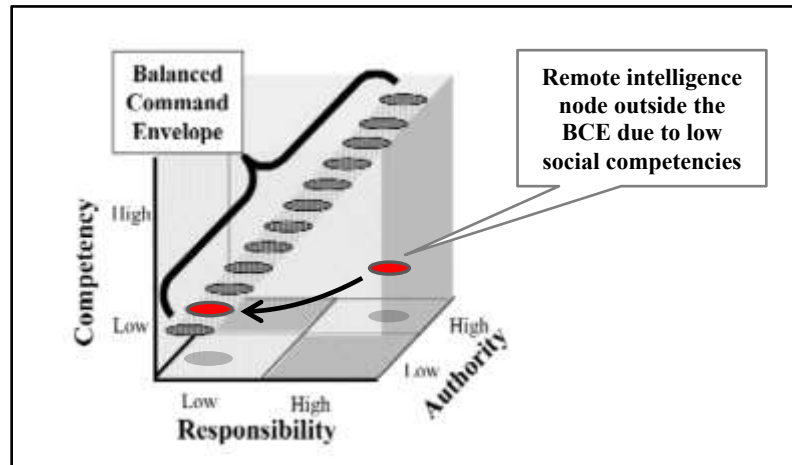


Figure 4 -- Limiting Authority and Responsibility to Restore the BCE

Source: Adapted from Ross Pigeau and Carol McCann, “Re-conceptualizing Command and Control,” *Canadian Military Journal* (Spring 2002): 61.

Augmenting Social Competencies

7. While centralized control provides a potential solution, it is largely antithetical to the SOF *modus operandi* and may limit the Command’s ability to adapt priorities to rapidly changing circumstances as it does not address the relatively poor communication between silos. A complementary approach would be to augment relatively low social competencies (as represented in Figure 5) through effective leadership intervention in three ways:¹¹

“minimal balanced” depending on high or low levels of both responsibility and authority respectively. Provided authority and responsibility are balanced, and the degree of authority and responsibility delegated is commensurate to competency, one is within the Balanced Command Envelope (BCE).

¹¹ Susan E. Kogler Hill, “Team Leadership,” in *Leadership: Theory and Practice*, 8th ed., ed. Peter G Northouse (Los Angeles: Sage Publishing, 2019), 372-390. Intervention in this way is supported by both the Hill Model for Team Leadership and McGrath’s Critical Leadership Functions.

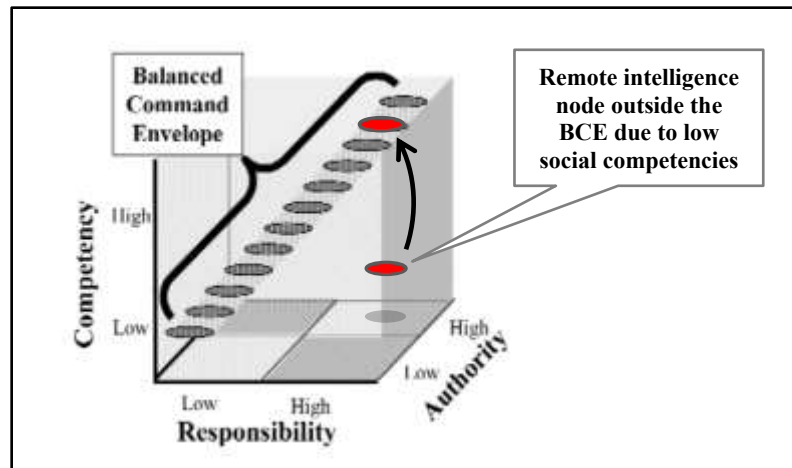


Figure 5 -- Augmenting Social Competencies to Restore the BCE

Source: Adapted from Ross Pigeau and Carol McCann, "Re-conceptualizing Command and Control," *Canadian Military Journal* (Spring 2002): 61.

- a. Revising Processes and Structure. Battle-rhythm events serve to force communication; however, communication can remain shallow and ineffective, especially when solely aimed at meeting the leader's information requirements (e.g. traditional J2 coordination meetings). An alternative would be to trade breadth for depth by limiting discussion to those items requiring cross-silo collaboration. This could be achieved by carefully controlling the agenda ahead of time, or by dynamically reinforcing those items in need during discussion. In either case, the effect is to turn a traditional meeting aimed at informing up the chain of command, into a more meaningful working group aimed at facilitating cross-silo collaboration.¹² Such working groups could also provide a vehicle for the leadership to identify dependencies and opportunities for collaboration between silos, thus serving as a forcing function.
- b. Mentoring and Coaching. While personality traits tend to be relatively fixed over time, social competencies, such as interpersonal skills, are teachable.¹³ Thus another avenue for intervention is to provide coaching and mentoring to augment weak social competencies. Such coaching

¹² McChrystal, *Team of Teams*, 164-169. The leader may also choose to appoint a 'controller' to chair the meeting who possesses social and emotional competencies if the leader is lacking and/or in order to focus communication away from satisfying the leader's information requirements. The leader should, however, continue to reinforce their intent, albeit selectively. Such an approach was adopted by McChrystal when he conducted his Operations and Intelligence (O&I) meetings. A subordinate would act as "controller" and execute the O&I in accordance with his intent. The point here is that there was also a qualitative difference to the conduct of the O&I, and the *raison d'être* was not simple broad dissemination of information using robust classified information systems.

¹³ Wendy L. Bedwell, Stephen M. Fiore and Eduardo Salas, "Developing the Future Workforce: An Approach for Integrating Interpersonal Skills Into the MBA Classroom," *Academy of Management Learning and Education* 13, no. 2 (2013): 171-186. Bedwell *et al* suggest doing exactly this as part of the MBA curriculum and provides a good list of references and literature review with respect to teaching interpersonal skills.

could be in the form of collective professional development sessions, targeted one-on-one coaching to address specific deficiencies, or externally provided training and seminars, but to name a few.

- c. Affecting Organizational Culture. In addition to directly influencing the individuals involved, affecting organizational culture provides an indirect method to influence follower behaviour. The intelligence leadership can affect organizational culture by systemically rewarding and punishing according to desired practices and values.¹⁴ Likewise, structures and procedures, such as those discussed in the above section, will become important “secondary maintenance mechanisms” of organizational culture by institutionalizing behaviours and values.¹⁵ Lastly, the leader must be cognisant of their verbal and non-verbal communication, and the role it plays in embedding their espoused beliefs, values, and assumptions in the organizational culture.¹⁶ Thus, an effective intelligence leader must continually perpetuate a culture that values positive social interactions through open and effective communication. The issue of organizational culture will be revisited below in a more wholistic manner.

Establishing Common Intent

8. Another possible obstacle to cross-silo collaboration and unity of purpose could be a lack of common intent. Pigeau and McCann contend that a high common intent amongst a group of subordinates has the effect of more tightly grouping possible solutions to any given problem within a potentially boundless solution space (see Figure 6).¹⁷ This common intent is achieved through both implicit and explicit means.¹⁸ In the case of decentralized C2, as in the case of a distributed intelligence architecture, a relatively high amount of shared implicit intent is required to ensure semi-autonomous actions are acceptable and aligned towards achieving a common purpose. Similar to the above discussion with respect to the CAR model and ensuring a BCE, the intelligence functional authority may choose to be more explicit with their intent if co-ordinated action is lacking, until such time as a tacit understanding (i.e. a shared implicit intent) is achieved.¹⁹ Such explicit direction may be needed if team members lack an understanding of their individual or collective goals, roles, dependencies, activities,

¹⁴ Such an approach could highlight successes of team collaboration through the promulgation of storyboards, clarify expectations with respect to communication and collaboration through CFPAS, nominate individuals for H&A where they exceed professional expectations of collaboration and altruism, and apply administrative corrective measures where there remains wanton anti-social behaviour.

¹⁵ Edgar H. Schein, *Organizational Culture and Leadership*, 5th ed (Hoboken, New Jersey: Wiley, 2017), 199-205.

¹⁶ *Ibid.*, 181-196.

¹⁷ Ross Pigeau and Carol McCann, “Establishing Common Intent: The Key to Co-ordinated Military Action,” in *The Operational Art*, ed. Allan English (Kingston, Ontario: Canadian Defence Academy Press, 2006), 101-104. In emphasising common intent, one must also be wary of contributing to group think.

¹⁸ Pigeau and McCann, “Establishing Common Intent...,” 87-91. Explicit intent is achieved through explicitly communicated control mechanisms. Implicit intent is unexpressed, but assumed to be understood, and guides actions in unanticipated circumstances.

¹⁹ *Ibid.*, 97.

situational context, overarching plan, or decision making processes.²⁰ Thus common intent must be aimed at establishing a shared understanding of both the intelligence problem as well as the organizational means and methods of addressing said problem.

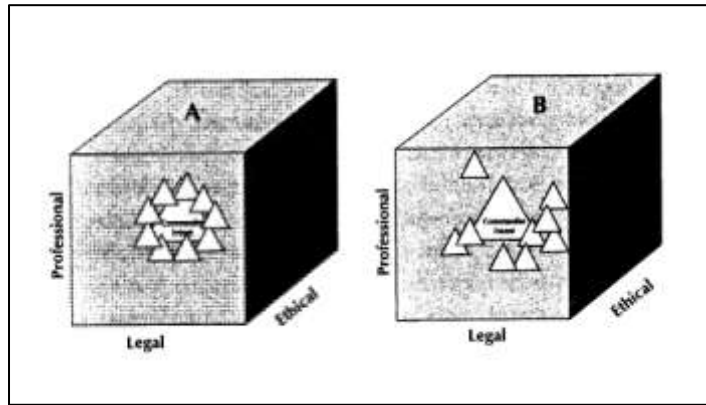


Figure 6 -- Commander and Subordinate Intent: (A) Tightly Clustered, or (B) Poorly Clustered Within the Acceptable Solution Space

Source: Pigeau and McCann, "Establishing Common Intent...", 102.

Motivation, Commitment, and Participative Leadership

9. The above discussion is predicated on the assumption that subordinates (or intelligence nodes) either lack competencies or understanding, and that this is creating an obstacle to achieving cross-silo collaboration and common purpose within the intelligence enterprise. However, a lack of follower motivation or commitment could equally be at fault.²¹ Given the Command's culture and selection criteria, this lack of motivation and commitment is likely not aimed towards mission success, but could manifest as a lack of 'buy-in' with respect to intelligence business practices or culture. Path-goal theory supports that participative leadership, whereby followers are consulted and contribute towards decisions, has the effect of "...increased performance through member participation and dedication to shared group goals."²² Given the increasingly complex nature of intelligence problems, and the need to adapt to "ambiguous, unclear, and unstructured" intelligence problems, such an approach should also yield qualitative benefits by way of better understanding the problem and solution space.²³

Leadership and Organizational Culture

10. While this paper briefly touched on organizational culture as it relates to promoting positive social interaction, more discussion is warranted. While rigid hierarchies can be effectively controlled by bureaucratic rules and procedures, a complex

²⁰ D.F. Noble, *Understanding and Applying the Cognitive Foundations of Effective Teamwork* (Vienna, Va: Evidence-based Research Inc., 2004) quoted in *Ibid.*, 98.

²¹ *Ibid.*, 100-101.

²² Peter G. Northouse, *Leadership: Theory and Practice*, 8th ed. (Los Angeles: Sage Publishing, 2019), 120.

²³ *Ibid.*, 123. Northouse contends that participative leadership is particularly well suited to followers who are "autonomous, have a need for control, and have a need for clarity" around tasks that are "ambiguous, unclear, and unstructured."

adaptive system requires strong organizational culture to guide semi-autonomous action, encourage communication, and ensure unity of purpose. As Edgar Schein explains:

The most important conclusion... is that culture is a multidimensional, multifaceted phenomenon, not easily reduced to a few major dimensions. Culture fulfills the function of providing stability, meaning, and predictability in the present but is the result of functionally effective decisions in the group's past.²⁴

Schein identifies organizational identity, strategy, means, and structure as playing significant roles in affecting culture. Likewise, he highlights achieving shared understanding and consensus around issues of external adaptation and internal integration as important drivers of culture.²⁵ Thus, an effective intelligence leader must be cognisant of how consensus and understanding is arrived at within the enterprise. Furthermore, an effective leader will use embedding mechanisms to ensure desirable cultural beliefs and values are emphasised while negative beliefs and values are marginalized.²⁶ These primary and secondary embedding mechanisms are reproduced in Table 1. The literature on transformational leadership, which is “concerned with emotions, values, ethics, standards, and long-term goals,” is important in this respect.²⁷ In terms of arriving at a group consensus, participative leadership should also promote the internalization of shared organizational goals, beliefs, and values amongst members.

Table 1 -- How Leaders Embed Their Beliefs, Values, and Assumptions

Primary Embedding Mechanisms	Secondary Reinforcing and Stabilizing Mechanisms
• What leaders pay attention to, measure, and control on a regular basis • How leaders react to critical incidents and organizational crises • How leaders allocate resources • Deliberate role modelling, teaching, and coaching • How leaders allocate rewards and status • How leaders recruit, select, promote, and excommunicate	• Organizational design and structure • Organizational systems and procedures • Rites and rituals of the organization • Design of physical space, facades, and buildings • Stories about important events and people • Formal statements of organizational philosophy, creeds, and charters

Source: Schein, *Organizational Culture and Leadership*, 183.

²⁴ Schein, *Organizational Culture and Leadership*, 178.

²⁵ *Ibid.*, 150. Problems of external adaptation include; mission, goals, means, measurement, and correcting and repairing. Problems of internal integration include; language, identity and boundaries, authority, trust and openness, rewards and punishments, and “the unexplainable” -- explained as the concepts (schema) required to explain the unexplainable (phenomena).

²⁶ *Ibid.*, 183.

²⁷ Northouse, *Leadership*, 163.

CONCLUSION

11. Given the decentralized nature of a distributed intelligence architecture, decentralized execution is a *fait accompli*. The question remains, however, how much to centralize control, and what are the necessary pre-conditions to maximize efficacy within a decentralized complex adaptive intelligence enterprise. Figure 7 combines the theory discussed to provide a reference for both diagnosis and to inform leadership intervention in driving the intelligence enterprise towards a complex adaptive network. While the implementation of a complex adaptive network should maximize efficacy of the intelligence enterprise, wholesale implementation, without first validating and cultivating the required preconditions, represents considerable risk.

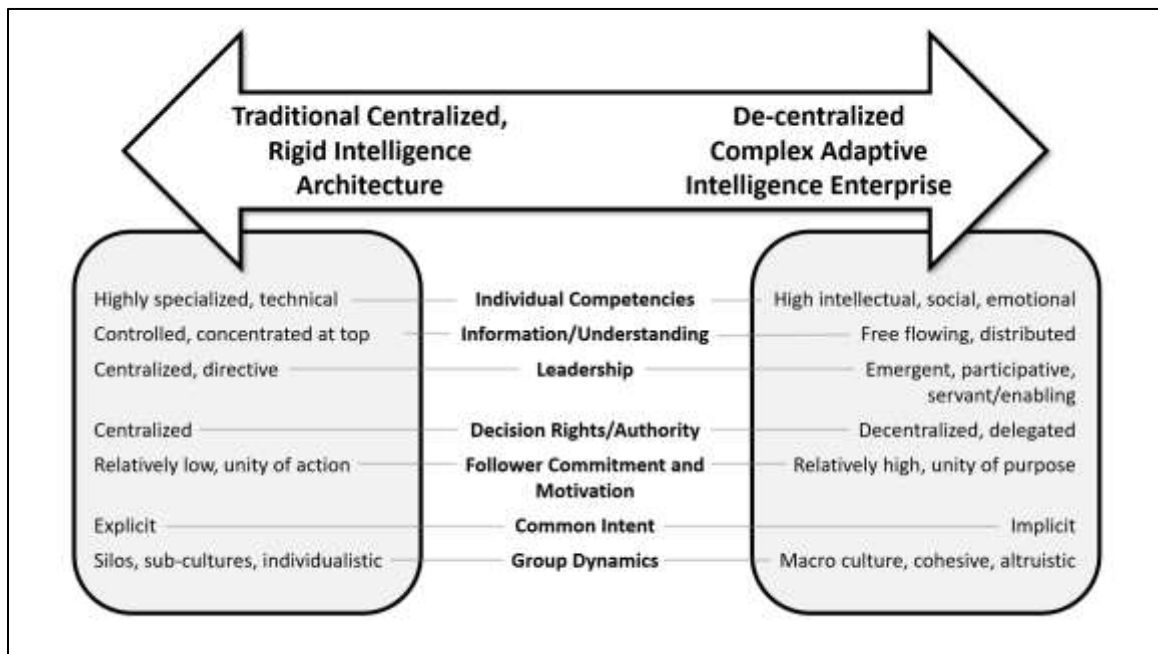


Figure 7 -- Characteristics of Traditional Intelligence Hierarchies versus De-Centralized Complex Intelligence Networks

Source: Adapted from various sources.

RECOMMENDATION

12. With consideration to the preceding discussion, and in addressing challenges in operationalizing the Commands intelligence architecture as a Team of Teams, this paper makes the following recommendations:

- a. Use required control mechanisms (explicit intent) to stop-gap deficiencies and manage risk accordingly. Deliberately adjust these controls as conditions of an edge organization are set.
- b. Carefully observe and diagnose the problem. Is it a problem internal or external to the intelligence function? What is the location and nature of the problem? Once the issue has been identified, consult the relevant

literature (see above and the bibliography), and determine the appropriate leadership intervention. Continuously scan and re-evaluate the problem.

- c. Appreciate the limits of functional authority compared to command. Accept that unity of purpose does not necessarily equate to unity of action and that some obstacles may be symptomatic of larger C2 issues within the Command.
- d. Promote and reinforce an organizational culture that values emergent or participative leadership, positive social interaction, open communication, free exchange of ideas, altruism, and other characteristics of a complex adaptive intelligence enterprise seen in Figure 7.
- e. While beyond the scope of this paper, consult the literature on change management before implementing change.

Annexes:

Annex A	Bibliography
Annex B	Factors Promoting Complex and Distributed Intelligence Architectures

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FACTORS PROMOTING COMPLEX AND DISTRIBUTED INTELLIGENCE ARCHITECTURES

1. Increased demand for intelligence due to a contemporary operating environment (COE) that is increasingly volatile, uncertain, chaotic, and asymmetric (VUCA), within the context of conflict or competition, and requiring a high degree of precision;
2. Increased utility of strategic (ie. NCR-based) capability providing tactical effects; both in terms of national technical means (NTM) (ie. strategic collection capabilities) providing tactical intelligence effects, and the mutually supporting mandates of inter-agency national security partners within a Whole of Government (WoG) framework;
3. Limited human resources as it relates to the intelligence function, even after the moderate growth identified in *Strong, Secure, Engaged*;
4. Force employment concepts, and recent missions, that have embraced a distributed CAF laydown in a non-contiguous battlespace framework (e.g. *Adaptive Dispersed Operations*, *Close Engagement*, Op ATTENTION, and Op IMPACT), thus driving a similarly distributed intelligence support architecture;
5. Improvements to classified information systems (CIS) allowing for increased remote intelligence support (e.g. remote processing, exploitation, and dissemination [PED] of airborne intelligence, surveillance, and reconnaissance (ISR) through beyond the line-of-sight [BLOS] datalinks);
6. A desire to institutionalize traditionally deployable capabilities in domestically-based organizations (eg. The Joint Targeting Intelligence Centre [JTIC]), thus creating bureaucratic inertia towards reach-back support; and
7. Robust infrastructure requirements and risk associated with establishing Secure Compartmentalized Information Facilities (SCIFs) in forward Areas of Operation (AOs).