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The Meta-Organization

A Research and Conceptual Landscape

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Abstract

Governments are increasingly requiring different agencies to work together in demanding circumstances using a whole of government or comprehensive approach. This paper applies a social and human perspective to examine how a meta-organization may be capable of enacting a comprehensive approach. The multi-disciplinary analyses integrate a number of disparate concepts to present speculative hypotheses that may be used to inform future research agendas. The initial section examines the problem space that requires comprehensive approaches with discussion of wicked problems, convergence and assemblage, and the management of the commons. The second major component assesses how agencies can be organized to deal with these issues with comparison of the hierarchical bureaucratic approach to that of professions and complex adaptive systems. The two subsequent sections present the implications for moving from traditional managerial structures to alternate organizational approaches with specific consideration of the human element. The key suggestion presented is that government-led comprehensive approaches likely require setting the conditions to enable the emergence of a constrained complex adaptive system as the appropriate framework to enable meta-organizational effectiveness. Implications for future research are provided in the domains of theory building, modelling and simulation, organizational analyses, lessons learned and professional development.

Résumé

De plus en plus, les gouvernements demandent à différentes organisations de travailler ensemble dans des circonstances difficiles en adoptant une approche globale. Dans le présent document, nous examinons d'un point de vue social et humain la façon dont une méta-organisation peut s'y prendre pour mettre en œuvre une approche globale. Nous analysons divers concepts distincts dans le but de formuler des hypothèses susceptibles d'éclairer les futurs programmes de recherche. Dans la première section, nous nous penchons sur l'étendue des problèmes nécessitant une approche globale en nous intéressant plus particulièrement aux problèmes pernicieux, à la convergence et à l'association, et à la gestion des ressources communes. En deuxième lieu, nous voyons comment on peut préparer une organisation à composer avec ces difficultés en comparant la méthode hiérarchique à celle utilisée en milieu professionnel et dans les systèmes adaptatifs complexes. Dans les deux sections subséquentes, nous montrons ce qu'implique le fait de délaisser une structure de gestion classique pour adopter une méthode organisationnelle différente, en tenant particulièrement compte de l'aspect humain. Enfin, nous en venons à la conclusion que l'adoption d'une approche globale dirigée par le gouvernement exige vraisemblablement d'établir des conditions précises qui formeront le cadre nécessaire, c'est-à-dire un système adaptatif complexe et restreint, pour garantir l'efficacité de la méta-organisation. Cette étude fournit également des pistes en vue de recherches ultérieures dans les domaines de l'élaboration de théories, des technologies de modélisation et de simulation, des analyses organisationnelles, des leçons retenues et du perfectionnement professionnel.

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Executive summary

The Meta-Organization: A Research and Conceptual Landscape

Alan Okros; John Verdun; Paul Chouinard; DRDC CSS TR 2011-13; Defence R&D Canada – CSS; June 2011.

Introduction: Governments are increasingly requiring different agencies to work together in demanding circumstances using a whole of government or comprehensive approach. As part of the Technology Investment Fund project Modelling Meta-Organisational Collaboration and Decision Making, this paper applies a social and human perspective to examine how a meta-organization may be capable of enacting a comprehensive approach. The ideas presented are informed by the generalized observations that when interdepartmental, combined efforts produce good results, these outcomes are often attributed to effective decision making and planning by key leaders while, when things don't go as intended, the problems are often blamed on 'culture differences' in the various organizations involved. The multi-disciplinary analyses integrate a number of disparate concepts that may explain these observations with presentation of a series of speculative hypotheses that may be used to inform future research agendas.

Results: The initial section examines the problem space that requires comprehensive approaches with discussion of wicked problems, convergence and assemblage, and the management of the commons. The primary implication drawn from this initial component of work is that the central challenges are intellectual not managerial, particularly that the key is how one understands the problems rather than how one plan, organizes or directs efforts to resolve them. The second major component assesses how agencies can be organized to deal with these issues with comparison of the hierarchical bureaucratic approach to that of professions and complex adaptive systems. The key conclusion drawn from this component of the paper is that the most effective approach to ensuring teams from different organizations can work together effectively is to enable a high degree of creativity, flexibility and adaptability at the working level thus implies shifting from the hierarchical control approach to allowing emergent and dynamic complex adaptive teams. The third sections present the implications for moving from traditional managerial structures to alternate organizational approaches with recognition that governments must retain some degree of oversight however need to develop significantly different intellectual models and organizational principles in order to ensure meta-organizational success under comprehensive approaches. The central implication presented is the requirement for governments to enable what we call constrained complex adaptive systems (C-CAS). The fourth section provides specific consideration of the human element within the C-CAS. The primary implication of examining why effective or ineffective interpersonal relations in C-CAS can arise is to shift analyses beyond simple explanations to look for conflicting worldviews, priority given to differing outcome or conduct values; or the failures to anticipate, learn or adapt. The final section provides implications for future research in the domains of theory building, modelling and simulation, organizational analyses, lessons learned and professional development

Significance: As a TIF initiative with a greater emphasis on generate research questions than on answering them; the most significant output from this research is presented as fifteen broad, speculative hypotheses representing the central theme that emerged from each of the topic areas considered. The concluding discussion provides a broad set of recommendations for future

research which, as a whole, strongly encourage researchers to more critically examine the models, frameworks and literatures that they are drawing on and to engage in more cross-disciplinary work to challenge and critique discipline-specific taken-for-granted assumptions. While the emphasis for future research should be in the theory building domain as well as modelling and simulation to test the various speculative hypotheses presented, some limited suggestions have been presented in the more applied domains of organizational analysis, lessons learned and professional development.

Future plans: Options will be explored to link this work into various applied research projects with two primary aims. The first is to identify opportunities to test the fifteen broad hypotheses presented and to identify corollary implications which may be relevant to specific research questions. The second is to draw on the integration provided to inform lessons learned analyses of whole of government approaches such as has been applied in Afghanistan.

Sommaire

The Meta-Organization: A Research and Conceptual Landscape

Alan Okros; John Verdun; Paul Chouinard ; DRDC CSS TR 2011-13 ; R & D pour la défense Canada – CSS; juin 2011.

Introduction : De plus en plus, les gouvernements demandent à différentes organisations de travailler ensemble dans des circonstances difficiles en adoptant une approche globale. Dans le présent document, rédigé dans le cadre du projet de modélisation de la collaboration et de la prise de décisions méta-organisationnelles financé par le Fonds d'investissement technologique (FIT), nous examinons d'un point de vue social et humain la façon dont une méta-organisation peut s'y prendre pour mettre en œuvre une approche globale. Les idées présentées découlent de l'observation répandue selon laquelle une collaboration interministérielle donnant de bons résultats est souvent le fruit d'une planification et d'une prise de décisions efficaces de la part des principaux dirigeants, alors que lorsque les choses ne se déroulent pas comme prévu, cela est souvent attribuable à des « différences culturelles » entre les diverses organisations participantes. Nous analysons divers concepts distincts dans le but de formuler des hypothèses susceptibles d'éclairer les futurs programmes de recherche.

Résultats : Dans la première section, nous nous penchons sur l'étendue des problèmes nécessitant une approche globale en nous intéressant plus particulièrement aux problèmes pernicieux, à la convergence et à l'association, et à la gestion des ressources communes. La principale conclusion que nous en tirons est que les grandes difficultés se situent davantage sur le plan intellectuel que gestionnaire, c'est-à-dire qu'il faut d'abord chercher à comprendre comment les gens envisagent les problèmes plutôt que de s'attarder à la façon dont ils planifient, organisent et dirigent les efforts en vue de les résoudre. En deuxième lieu, nous voyons comment on peut préparer une organisation à composer avec ces difficultés en comparant la méthode hiérarchique à celle que l'on utilise en milieu professionnel et dans les systèmes adaptatifs complexes. La principale conclusion formulée dans cette section est que la meilleure façon de faire en sorte que des équipes provenant d'organisations différentes collaborent efficacement consiste à accorder beaucoup de place à la créativité et un degré élevé de flexibilité et d'adaptabilité sur le plan opérationnel. Cela implique de laisser tomber le modèle hiérarchique pour se tourner vers un système adaptatif complexe et dynamique. Dans la troisième section, nous montrons ce qu'implique le fait de délaisser une structure de gestion classique pour adopter une méthode organisationnelle. Pour assurer la réussite d'une approche globale en contexte méta-organisationnel, un gouvernement, tout en conservant un certain degré de supervision, doit se tourner vers des modèles intellectuels et des principes organisationnels différents. Nous en concluons que le gouvernement doit adopter un système adaptatif complexe et restreint (SAC-R). Dans la quatrième section, nous nous penchons sur l'aspect humain d'un SAC-R. En cherchant à connaître les facteurs qui influencent le degré d'efficacité des relations interpersonnelles dans le cadre d'un SAC-R, nous laissons de côté les explications simplistes afin de déceler les points de vue divergents, les priorités différentes ou les manques de prévoyance, d'apprentissage ou d'adaptation. Dans la dernière section, nous présentons des pistes en vue de recherches ultérieures dans les domaines de l'élaboration de théories, des technologies de modélisation et de simulation, des analyses organisationnelles, des leçons retenues et du perfectionnement professionnel.

Portée : Comme cette initiative financée par le FIT vise surtout à générer des sujets de recherche plutôt qu'à trouver des réponses, nous présentons quinze grandes hypothèses à propos du thème central de chacun des sujets étudiés. Dans la conclusion, nous donnons un large éventail de recommandations en vue de recherches ultérieures et afin d'inciter les chercheurs à poser un regard critique sur les différents modèles, cadres et documents dont ils disposent et à s'investir davantage des travaux interdisciplinaires afin d'être en mesure de mettre en doute les idées reçues. Bien que les prochaines recherches doivent surtout porter sur l'élaboration de théories ainsi que sur la modélisation et la simulation pour tester les hypothèses formulées, certaines de nos suggestions touchent des domaines plus pratiques tels que l'analyse organisationnelle, les leçons retenues et le perfectionnement professionnel.

Recherches futures : Nous tenterons de lier ce travail à différents travaux de recherche appliquée dans le but d'atteindre deux objectifs principaux. Premièrement, nous tenterons de trouver des occasions de mettre à l'épreuve les quinze grandes hypothèses présentées et de déterminer leurs implications, lesquelles pourraient susciter des sujets précis de recherche. Enfin, nous tirerons parti des conclusions obtenues afin d'orienter les analyses des leçons retenues des démarches pangouvernementales comme celle ayant été mise en œuvre en Afghanistan.

Table of contents

List of tables

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1   INTRODUCTION

1.1   THE META-ORGANIZATIONAL CONTEXT

Increasingly, governments are requiring individuals or teams from a number of different organizations to work together to achieve complex goals and objectives. Although this requirement is not new, the frequency and complexity of the issues to be addressed along with the increased urgency and media scrutiny surrounding these efforts have led to greater interest in understanding the dynamics of multi-organizational activities under what are called comprehensive, integrated or whole of government approaches.[1] Recent examples include government-led responses to natural disasters such as Hurricane Katrina, the Asian tsunami and the Haiti earthquake; to pandemics such as the SARS crisis and expected (although not really experienced) H1NI outbreaks; in ensuring physical security at events such as the Vancouver Olympics or Toronto G20; and, with efforts to achieve long term stability and development in fragile states such as Afghanistan, Sudan and Congo (to name but a few). This paper is written to contribute to a multi-faceted research project examining the key issues that have arisen and, in particular, to provide observations that may inform further academic and applied research; organizational lessons learned analyses; and, ultimately, government policies, approaches and practices to address future comprehensive approaches. As this research is conducted for the Department of Defence (DND) and the Canadian Forces (CF), special attention will be given to defence and security however it is considered that the ideas presented should apply across government and to joint public-private partnerships. Further, this work is primarily based on the dominant literatures and practices in the North American and European contexts however, again, may be relevant in other settings.

As a Technology Investment Fund initiative, the Meta-Organizational research project is designed more to generate research questions than to answer them. Thus, this work provides an integration of a number of disparate concepts and ideas to present a series of speculative hypotheses that may be used to inform future research agendas and studies while also possibly contributing to more immediate planning of specific multi-agency initiatives and/or analyses of those already conducted. The ideas presented are informed by a generalized observation that when interdepartmental, combined efforts produce good results, these outcomes are often attributed to effective decision making and planning by key leaders while, when things don't go as intended, the problems are often blamed on 'culture differences' in the various organizations involved. With the response to Hurricane Katrina serving as an unfortunate example (United States House of Representatives, 2006), the focus on culture differences seems to arise when observers note that: the requirements for different agencies to work together effectively were apparent; the overall government direction to do was clear; and the motivation of all involved to address the problems was strong; yet things still didn't go as well as would be expected with the conclusion that this must be due to some 'culture' factors that are beyond the control of those in charge. This paper will present a series of observations and 'speculative hypotheses' to explore which aspects of 'culture' may be relevant in explaining both why things go well sometimes and things go poorly other times and to suggest how and why these key aspects are, in fact under the control or, at a minimum, the influence of those charged with ensuring success. Thus, in order to understand how to optimize outcomes under comprehensive approaches, this paper will examine multi-organizational issues from a social and human perspective.

The research integrated in this paper is framed by three key considerations. First, it is to examine issues in the public domain and, in particular, the manner in which government rather than the

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[1] This paper will use the phrase comprehensive approach as it appears to be the most frequently used.

private sector functions. Second, it is recognized that governments require specific types of work to be conducted in certain ways thus it is to consider why and how government seeks to organize and direct activities. Third, it is understood that it is people who must carry out this work under government direction therefore this research will seek to explain the human dynamics at play. Thus, the focus of this paper is to help understand how individuals from different organizations can work together to achieve objectives directed by government in a manner consistent with government regulations. A common approach to addressing this issue is to focus on the types of direction provided by those at the most senior levels in government and the types of decisions made by those in charge of carrying out this direction to ensure that the right work gets done the right way.

The assumption is that the combination of an integrated comprehensive strategy with relevant policies and clear roles specified for each contributing agency accompanied with effective supervisory decision making and horizontal collaboration with those from other departments to allocate resources and direct activities should ensure success. As an illustration of the philosophy incorporated in this paper, ***three observations are made which serve to challenge the key taken-for-granted assumptions at play here***.

- First, just because a group of people require a degree of structure and organization to accomplish objectives does not mean that somebody has to be in charge.
- Second, just because decisions need to be taken to initiate or amend what people do does not mean somebody has to make decisions.
- Third, just because people have to interact with each other does not mean that somebody has to regulate their conduct.

As an example, consider what often occurs when the traffic lights go out at a busy intersection: motorists and pedestrians quickly establish an orderly way to get through the intersection without bumping into each other yet without any one person being charge, making decisions or regulating how they conduct themselves (see Surowiecki, 2004).

To consider – and challenge - what we know (or think we know) about how and why individuals do what they do in the context of multi-agency, government activities, this paper will present a number of key concepts with a consideration of the common or dominant way in which the concept is understood followed by some alternate perspective that serve to challenge conventional wisdom. These dominant and contradictory views will be integrated to provide a more holistic understanding of the dynamics which can actually occur rather than the ones that managers (and researchers) assume will take place. The general outline will be to, first, consider the problem space that requires comprehensive approaches, then, to examine how agencies can be organized to deal with these issues and finally to present implications for moving to a more open organization or what will be referred to as enabling a constrained complex adaptive system as the appropriate framework to enable meta-organizational effectiveness under comprehensive approaches.

1.2   GOVERNMENTS, SOCIAL ORDER AND ADMINISTRATION OF PUBLIC INSTITUTIONS

Prior to exploring the central topics of this paper, it is necessary to briefly touch on the focus of this research which is government-led comprehensive approaches to address certain types of

issues.[2] Governments exist to create and maintain social order and manage social goods. Under conditions of shock, social order can become disrupted, social goods can be eroded and general anxiety can increase. Government and the strengths and stability of a nation's institutional framework function to reduce uncertainty which requires public trust and confidence in both government and institutions. For the purposes of this paper, institutions are presented as structures (rule sets and systems) and mechanisms of social order, enforcement, (property and other) rights and cooperation governing the behavior of a set of actors. Institutions are identified with a social purpose and permanence, thus transcending individual human and organizational lives, and with the role of making and enforcing norms and rules that govern cooperative human behavior. The term "institution" is commonly applied to customs and behavior patterns important to a society, as well as to particular formal organizations of government and public service. An institutional framework is the comprehensive inter-dependent set of institutions that determine the nature of a society and how people, organization and government interact. Governments, professions and related institutions earn public trust when they fulfill the public trust and are seen to do so in a manner that is consistent with the expectations of the broader society. A key implication of this brief introduction is to highlight the commonality across situations requiring government-led comprehensive approaches that governments have unique responsibilities for preserving social order and ensuring social goods including maintaining public trust and confidence in key institutions.[3]

Given the amount of power in the hands of government and, in particular, the capacity of a government to affect the lives of citizens as well as the need to maintain public confidence, nations have developed various approaches to the administration of government. Noting the emphasis on checks and balances in the US system, Canada relies on the Westminster parliamentary system. In this system, the focus is on accountability with government (both politicians who are members of Cabinet and the members of the Public Service who carry out Ministers' directions) accountable to Parliament (comprised of both all elected members and Parliamentary agencies) with elected members of Parliament, in turn, accountable to the electorate through the ballet box.[4] Of importance, this system emphasizes unique Ministerial accountability which, in turn creates the internal governmental 'stovepipes' with vertical responsibility will be given greater emphasis than horizontal cooperation and with a set of rules that restrict cross-organizational (horizontal and diagonal) interactions.[5] Against this general framework, the very concept of a comprehensive approach implicitly suggests a type of 'institutional innovation'. While this paper will argue for new methods and approaches to creating the conditions for success under comprehensive approaches, it is recognized that there are practical limits to the degree of institutional innovation that is possible due to the system of Ministerial accountability.

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[2] The 'types of issues' will be explored starting with the following section

[3] This concept is incorporated in Canadian Forces Leadership doctrine with presentation of primary outcomes such as mission success but also second order outcomes of public trust, confidence and support. See *Conceptual Foundations.*

[4] We will conveniently skip the issue of members of the Senate who are appointed by the Governor General on recommendation by the Prime Minister and who can be 'disqualified' under certain circumstances.

[5] The problems created are recognized by the Federal Government as reflected in the current pan-government 'web of rules' initiative. See http://www.tbs-sct.gc.ca/reports-rapports/wr-lr/index-eng.asp (accessed 10 May 2010).

2   EXAMINING THE PROBLEM SPACE

2.1   COMPREHENSIVE APPROACHES

As already indicated, the focus of this research is to examine how to ensure success in government-led, multi-agency initiatives. As also stated, the most common assumption is that success will be achieved by focusing on providing the correct decisions and directions to ensure effectiveness. In a recent review of the Norwegian government approach, de Coning et al (2009) stated:

> "The rationale for a national whole-of-government approach is greater effectiveness. It is driven by the assumption that a government's foreign engagements will have a more meaningful and sustainable impact when the various government departments involved pursue a common strategy, have a shared understanding of the problem, a common theory of change, and an agreed plan for implementing such a strategy." (p 47)

Unfortunately, this recommendation is based on two key taken-for-granted assumptions that do not really hold true. The first is that the call for a single (common) strategy, understanding of the problem, theory of change and plan for implementation are reflective of a classic, bureaucratic, managerial approach to problem solving or, more accurately, reflects the methods used to solve routine or typical problems. The difficulty is that the types of problems that cause national governments to adopt comprehensive approaches are not 'tame' problems rather they are typically large, amorphous, complex and evolving 'social messes', which we will present below, and are best approached as 'wicked problems'. The second invalid assumption is that the focus on effectiveness means that the critical function to be carried out is cross-organizational coordination. In fact, the original scoping of the DRDC TIF project highlighted the requirement to examine the nature of the types of cross-organizational working relationships that might be required with, in particular, consideration of the differences between collaboration, cooperation and coordination. Although often used inter-changeably, the lead researcher, Paul Chouinard, had suggested a hierarchy above simple information sharing with: cooperation as an arrangement to work towards a common goal; coordination as a control process used to achieve cooperation; and collaboration as a creative process to achieve something that did not previously exist.[6] While agreeing that these differentiations are important and that the higher order collaboration is what is required or expected under comprehensive approaches, we will extend this conceptualization further by suggesting that the over-arching framework is, in fact, convergence.

2.2   WICKED PROBLEMS

Originally developed to describe issues in the social policy arena, the central idea of wicked problems is that these involve complex, dynamic, multi-faceted, often chaotic and contradictory

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[6] Noting that there are some interesting similarities in the work by Pigeau and McCann in conceptualizing command and control particularly with their definition of command as 'the creative expression of human will necessary to accomplish the mission'.

types of social issues that are very difficult to comprehend let alone define or solve (Rittel & Webber, 1973). Addressing crime, illicit drug use or street gangs represent some examples from the urban social policy domain; preserving species, maintaining natural habitats, reducing green-house gases or addressing climate change are some from within the environmental portfolio; eradicating extreme poverty and hunger, providing universal primary education, promoting gender equality, reducing child mortality, improve maternal health, combating HIV/AIDS, malaria and other diseases, ensuring environmental sustainability, and develop a global partnership for development[7] are illustrative of the development domain; and, countering insurgencies, kidnappings, child-soldiers, weapons of mass destruction, the targeting civilians and other irregular warfare tactics are some from within physical security. Many of these issues are seen as 'social messes' as they can have wide spread impact on societies which, in turn makes them the responsibility of governments to address. Essentially wicked social problems will display a range of characteristics including that they:

- are difficult to clearly define

- are highly dynamic, non-linear, non-reducible, non-compressible and often not stable

- will have many interdependencies, that can be both multi-causal and pluripotent

- have non-trivial histories

- are socially complex

- involve responsibilities of multiple organization and jurisdictions

- have no clear or 'quick-fix' solution

- will inevitably present unforeseen consequences with any attempt to address them

- can represent areas of chronic policy failure

Wicked social issues require that government agencies and other actors work together in order to facilitate the engagement of socio-political systems, as dealing with these problems necessarily involves the behaviour of citizens (as individuals and groups) as well as cutting across internal and external organizational and jurisdictional boundaries. All involved in the problem/mess's 'ecology' need to be engaged (from citizen to stakeholder to policy maker) if successful policies are to be formulated and implemented. Social issues are posited to reach the threshold of wicked problems when there is a combination of a sense of urgency and a perceived likelihood that inaction will significantly erode the social good or social order.

Of greater importance than describing what differentiates wicked from tame problems are the implications for addressing them. Horn & Weber (2007) have pointed out the following key factors:

- the 'problem' is rarely ever understood or defined, however, how the problem is 'framed' and understood strongly influences how it is addressed and, contradictorily, how 'success' is defined determines how the problem is understood

- attempting to solve one wicked problem means solving other wicked problems or can create other wicked problems

- solution are not right or wrong but better or worse; further there is no finite range of alternate solutions

- each wicked problem is novel and unique thus each attempt to address a wicked problem is a one shot/ trial and error endeavour

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[7] The eight Millennium Development Goals.

- wicked problems always evolve over time and are never definitively solved

Based on these considerations, it is clear that these cannot be addressed solely through the application of rule sets developed on the basis of rational analyses, as they can neither be definitively described nor optimally solved. An additional complexity is that each stakeholder will likely have their own perspective as to the nature of the problem with often widely conflicting views on the 'correct' understanding, approach and assessment of a solution. Thus, while there can be agreement on the presence of a shared wicked social problem and the need for many players to work together to address it, there is a high likelihood that the various agencies will not agree on problem definition or the plan of action and almost certainty that they will not agree on whether/when it has been addressed sufficiently. What is perhaps most feasible in such situations is concurrence on the 'landscape' within which the wicked problem exists.

A core implication of the literature on wicked problems is that the scientific model of using sequential steps, assumed objectivity and rational logic to define, analyze and solve the problem will not be successful. Thus, the issue of addressing wicked problems is more than simply developing a resource management strategy to harness the capacities of multiple agencies and groups but must be understood as foremost an intellectual endeavour involving coping with 4 "C"s: complexity, chaos, contradictions and counter-intuitive solution sets. In this regard, it is posited that complicated problems have multiple variables while complex problems have multiple unknowns. As will be developed in subsequent sections, most public administration is based on this scientific management model hence is unsuited to addressing wicked social problems[8].

While a more complete answer as to how to address wicked problems will be developed later in this paper as additional considerations are brought forward, an initial suggestion is offered pertaining to intellectual models and how to think through wicked problems. The key is the approach taken to constructing and applying "knowledge". Aristotle differentiated between three different forms of knowledge: episteme, techne and phronesis. Episteme refers to knowledge that is abstract, generalizable and theoretical. It is scientific knowledge which can be made explicit, and can be recorded, written, validated and even protected. Through theoretical understanding we are able to share knowledge of how the universe works, and elevate our perceptive capacity toward the eternal order and harmony beyond our own powers of construction. Episteme and the concept of epistemology are concerned with discovering knowledge and constructing sharable understandings of what is 'known' with the recognition that differing belief systems and worldviews influence what is 'known' and how we know what we know. The key approach for reasoning related to episteme, is to question the assumptions that underpin what is 'known'.

Techne alludes to technical expertise which is often expressed through quantitative measures and rigid procedures – all with the purpose of 'making' something – the 'how-to' of how to do something, build something or practice a craft. Techne is a framework of fabrication that entails means (tools, methods and material). Moreover it is inextricably linked to the producer as a form of productive knowledge and who's products have a life of their own. The knowledge of techne concerns creating or doing things and is based on the assumption that the world works in predictable ways hence techne relies on the rational application of rules, theorems and laws to achieve intended results. The key approach is to consider what has worked in the past and replicate the process to produce a similar result again.

> "*Techne is the kind of knowledge an expert, competent individual, a craftsman or an appointed strategist possesses. It is the source of purposeful change, involving*

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[8] Lindblom (1958) has noted that public administration is the science of muddling through.

deliberate and purposeful intervention into the flux and flow of the natural world, shaping it and making it conform to human desire." (Chia & Holt, 2009)

Advancing technology and science depends on more than explicit knowledge (e.g. the 'epistemology' of facts, information, 'truths' and ideas). The capacity to advance the edges of any field of human endeavour (including those of science and technology) arises from what Arthur (2010) calls deep craft.

> *Deep craft is more than knowledge. It is a set of knowings. Knowing what is likely to work and what not to work. Knowing what methods to use, what principles are likely to succeed, what parameter values to use in a given technique. Knowing whom to talk to down the corridor to get things working, how to fix things that go wrong, what to ignore, what theories to look to. This sort of craft-knowing takes science for granted and mere knowledge for granted. And it derives collectively from a shared culture of beliefs, an unspoken culture of common experience. (Arthur 2010, p.159-60)*

Phronesis is experience that helps to actualize individuality, identity and aspiration (knowledge of how to make changes for the betterment of society). It is through action that a person will become both constituted as an individual as well as disclosing who one actually is, to oneself and to others. According to Chia & Holt (2009): "*Phronesis arises from within the whole striving that a person is. It comes into its own in situations that draw the self into action, to the extent that genuine praxis involves absorbed action – action as an ineluctable movement that a person can never step out of." In this way phronesis is deeply implicated in culture.* Phronesis and the ideas of practical – praxis-based wisdom are concerned with how to act in particular situations to achieve desired outcomes with the recognition that this requires independent judgment based on values with each situation seen as unique.

Episteme primarily involves explicit forms of knowledge, while techne involves significant proportions of both explicit and tacit knowledge. Phronesis would primarily involve tacit knowledge. Episteme and explicit dimensions of techne can be relatively straight-forward in application to traditional managing. However, managing the tacit dimensions of techne and phronesis represent the more complex dimensions of organizational culture and social interactions – the context that determines how individuals, develop a sense of their identity within the organization, interact with others, and engage in their work, and mutually shape identity. The sphere of action within which phronesis is emphasized is a key domain within which humans find the deep sense of themselves as individual and social beings and is the tacit ground of community, cohesion and/or discord.

The key approach for reasoning related to phronesis, is to examine the values that underpin judgments about appropriate ends, ways and means. Each is needed at different stages or to different degrees however the entire literature on wicked problems points out that, to address complex social messes, the key requirement is to start with a focus on asking the more abstract questions concerning values and assumptions (phronesis and episteme) rather than trying to identify the relevant 'facts' or proven processes based on what worked elsewhere. A corollary comes from the discipline of philosophy that one will rarely know whether the right questions have been asked let alone answered. Those who have difficulty understanding the necessity of asking questions for which there are likely no answers will likely also have difficulty as effective decision makers when addressing wicked social problems.

Beyond science and technology the practical 'knowings' that build up in all fields of endeavour become part of a shared culture and at this level are a form of craft. Whatever is known in a field – techniques, the quirkiness of equipment and tools, even theory is known by someone and these knowing root themselves in local micro-cultures in particular organizations, buildings, units. It takes time to build these types of knowing up and in fact they often do not transfer outside of their

local arising. They cannot be fully written down and thus genuine expertise remains largely in the people and localities where it arose as a part of shared and unspoken taken for granted environment. However, formal versions of craft also arise from these 'knowings' and can be eventually captured in technical papers and books.

It is for this reason that organizations and even countries can become leaders in particular types of science or technology and why it requires significant investment in clustered types of environments to foster related innovation. This process of building knowledge, (epistemology) from 'knowings' (techne and phronesis), is one that is often difficult to control and manage from the top-down. This is the domain and motivation for a shift where John Seely Brown suggests that "management has shifted from making products to making sense" (quoted in Arthur, 2010, p. 210). Senge (2006) also suggests that organizations that survive and are successful devote time and effort into developing the climate that supports the building of teams of teams that work together to meet organizational objectives by developing expertise in five disciplines: Personal Mastery, Shared Vision, Mental Models, Dialogue and Systems Thinking.

To summarize, as a first step in understanding how and why individuals act the way they do when working together under comprehensive approaches, it is necessary to understand the nature of the problem space that requires these approaches. The literature on wicked problems is informative as it illustrates that the linear, rational approach to problem solving will not be successful when applied to complex social messes. A theme drawn from this literature is that, while it is the responsibility of governments to resolve social messes, the power to actually do so often resides in a more dynamic relationship amongst the citizenry not within the State. It is best to see government agencies as charged with a support role to facilitate resolution of the social mess rather than in a lead role to solve the issue. Thus, in the domain of defence and security, the social messes they are charged with addressing may be better understood through the perspective of human security which places individuals and groups (e.g. family, community, culture/value group) at the centre of defining and resolving the issues rather than state security putting state concerns and the powers of state agencies at the centre (Alkire, 2003). Finally, while this review has identified that solving or resolving wicked social problems may be an impossible task, governments have an obligation to attempt to do so (or at least be seen and felt to be adequately 'containing' them, as we do with crime and other similar issues) which necessarily involves drawing on the perspectives, capacities and contributions of many different agencies and actors. This requirement leads to the second facet of examining the problem space: the concepts of convergence and, by extension, assemblage. Recalling that the purpose of this report is to raise potential research questions and that care must be taken in applying any broad hypothesis to any specific applied context, this discussion leads to the first of the speculative hypotheses offered:

Hypothesis: When seeking to address wicked social problems, failure to adopt an appropriate approach to framing questions will result in inaccurate or inadequate problem definition resulting in ineffective strategies to attempt to resolve the underlying problem(s).

2.3   CONVERGENCE

The label convergence is considered to describe the emergent conditions under which different actors come together. [9] Noting that actors can refer to individuals, organizations, institutions and

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[9] Noting that not all 'coming together' is beneficial: originating in meteorology, there are many examples where convergence can create a 'perfect storm'.

other representations of civil society,[10] the key idea conveyed through the use of convergence is a temporary/increased connection between two or more actors (who normally do not have this degree of connection) with the expectation of a subsequent separation and return to 'normal' conditions.

However, the expectation of a "return to normal" is increasing under challenge, if not already a past reality. It is now well established that the pace of change is accelerating and shifting competitive advantage toward persistent innovation. Related to the exponential advance of information and digital technologies is the ongoing maturing of a networked society (e.g. Castells (2000) among many) and the corresponding shift in corresponding economic principles (e.g. the increasing returns of 'network effects' and the need to manage information and knowledge with framework geared to abundance rather than scarcity). It could be argued that these orders of external change represent "change in the conditions of change" that are driving the need for organizational agility not only in response to new orders of wicked problems and rapid change but also to better achieve a mastery in strategic transformation as a core organizational competence. These external drivers also occur within the organization. However, the internal dynamics of organizations continue to act as conservative forces struggling to preserve traditional management cultures while simultaneously struggling to invoke greater innovation.

So far in this paper, a central facet of comprehensive approaches is that these have been seen as relating to individuals from different organizations having to find a way to attain some shared goal(s). When viewed simply as setting the conditions for individuals or teams to temporarily work together to achieve a common objective, the focus swiftly becomes on resource management and the typical managerial functions of planning, delegating, organizing and controlling the work to be done. As stated in the introduction, this led to the identification of the three functions of cooperation, coordination and collaboration as of relevance to ensure people worked together in an effective manner. This section will seek to expand this perspective to consider other, more fundamental implications of applying comprehensive approaches to resolving wicked social problems by presenting convergence and assemblage as much more than simply mechanisms to ensure unity of effort.

In parallel research examining comprehensive approaches in UN-led activities involving humanitarian, development and security operations, Miller & Rudnick (2008) discuss convergence in three domains: place (operating in the same location); practice (conducting similar activities in similar ways); and, premise (operating based on shared theories, models or worldviews). Their introduction of premise expands the consideration from simply where and how people work together to the intellectual and cultural facets of considering the shared bases for sense making and way-finding. Further, in work examining new approaches to military Command and Control, Alberts and Hayes (Alberts, 2007; Alberts & Hayes, 2003) have suggested replacing the central terms with agility, focus and convergence. They present convergence is a goal-seeking process that guides actions and effects. Their work includes the notion of independent development with the disparate actors present in complex endeavours learning to act in similar ways. As will be developed in further sections, they also point out that convergence is not control; it cannot be dictated or forced.

To extend this work further, it is considered that meaningful convergence can be considered on multiple levels including: conceptual (drawing on the same ideas), ontological and epistemological (common approaches to defining reality and generating knowledge (Gibbons et al, 1994), cultural (shared norms, beliefs and assumptions), functional (similar purposes), professional (contributing to the same social service/social good), informational (fusion of

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[10] And also noting that 'actor' has specific and different conceptual meaning in the various literatures including political science, sociology and anthropology

multiple sources of data), strategies (similar approaches to link ends, ways and means), communities (in the social sense) and connections (as communities of practice/ interest).

Of importance, convergence is understood as the requirement for individuals, groups or organizations to alter or amend aspects of how they normally 'do business' with changes ranging from fairly obvious elements such as adopting new work practices to relatively hidden domains such as shifting the worldview(s), assumptions or the epistemology that frames how one understands their reality. In addition to cooperation, coordination and collaboration, convergence can occur through additional forms such as co-dependence (relying on others for one's own success) and connection (mutual awareness of each other's activities). An important illustration of convergence in relation to research, science, technology development as these must be applied to innovation, complexity and the 'wicked problems' is that a new form of knowledge production has emerged. This new mode impacts both the knowledge that is produced as well as how it is produced, including: the context of pursuit; its manner of organization, incentives, and mechanism of quality control.

This new mode of knowledge production (Gibbons et al, 1994; Nowotny et al, 2000) occurs in a context of application (which emphasizes the need for unique assemblages of capabilities – for example the human genome project, the international space station, and more recent military operations). The increasing emphasis on innovation presents problems that cannot be contained within traditional disciplinary frameworks (and careers based on traditional disciplines). Several distinct characteristic mark of this new mode of knowledge production: it is transdisciplinary rather than mono- or multi-disciplinary nature; it is conducted in transient, non-hierarchical, heterogeneously organized forms; and finally it is tending to be subjected to more pressure to be more socially accountable. As a result knowledge production in this new mode must makes use of a wider range of criteria and in judging quality and what counts as 'good science'. This is especially relevant to the tacit dimension of both techne and phronesis which now must also be produced, shared and valued in more transient, dynamic and comprehensive contexts.

Understanding how convergence is taking place, or what it requires to take place involves examining the emergence of new practices, rules or assumptions that enable and support sharing amongst organizations including both the altering or abeyance of group norms and workplace procedures that were part of the previous status quo and the deeper individual acceptance of alternate ways of understanding the issues at play or developing effective strategies to resolve these.

When significant degrees of convergence occurs with multiple organizations, this would naturally involve some movement to a boundary-less organization[11] – and a shift to heterarchy which is a network form of organization relying on knowledge rather than position power. Correspondingly convergence would also seem to require that internal hierarchies become more elastic and organizational cultures to become more liminal characterized by more ambiguity, openness, and indeterminacy. The organization's shared, collective identity as well as aspects of each person's work identity would like shift with some experiencing a feeling of being dissolved or disoriented thus inducing a period of transition requiring the normal limits to behaviour and even thought to become more relaxed. This is an important consideration that, if not understood and addressed, can exacerbate anxiety and cultural resistance. Of importance, the common solution to dealing with the ambiquity created is to provide structure through decision making: defined roles, work

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[11] Or, at minimum, increasing permeability of boundaries.

priorities, rule sets etc however the more effective approach is to provide means through sense making. Positively this would lead to and require new perspectives.

Implicit in the concept of convergence is the organizational architecture of heterarchy. It could be argued that heterarchy is a type of responsible autonomy as the constituting organizations retain basic capabilities to act autonomously. Thus convergence is the development of negotiated enabling protocols, processes, tools, etc., that enable, on some level, a type of organizational self-organization. This is consistent with many dimensions of complexity, especially self-organization and emergence (where the whole is greater than the sum of the parts).[12] Thus the complement to convergence as well as multiplying its power is the concept of assemblage (De Landa 1991; De Landa, 2002, Delanda, 2006). Assemblage is the capacity to assemble novel capabilities from various components, to attain a greater agility to either to solve unique problems, respond to emergent situations or accomplish particular aims. Assemblage can occur at various levels – from assembling a team/group of people to assembling larger scale organizational capabilities (equipment, aggregate units, etc.). If convergence is understood as a 'top-down' or overarching governance capability for inter-organization interaction, then assemblage is a 'bottom-up' capability that can leverage both the network technologies and convergence. In addition, assemblage incorporates not just the capacity to adapt with agility but (and perhaps more importantly) provides a better platform enabling the capacity for exaptation. Exaptation is related to the term pre-adaptation and is often used to describe shifts in the function of a trait during evolution – common in both anatomy and behaviour. For example bird feathers initially evolved for temperature regulation, but later were adapted for flight, the fish bladder evolved as a mechanism of buoyancy and later was adapted as lungs. Within a techno-social economic context increasing dependent on innovation exaptation (often facilitated by serendipity) is key to the processes that serve agility and harnessing past solutions and applying in unexpected and new ways.

The movement toward convergence simultaneously requires a divergence from prior-practices, the need to reconfigure, to enable exaptation and to re-assemble subcomponents, in order to develop (assemble) the needed capabilities for inter-active efforts.[13] On some level, assemblage has to be self-organizing in order to provide the needed agility. Without the self-organized assembling of capabilities – two or several bureaucracies will continually have to negotiate control and coordination, thus increasing the transaction and coordination cost and ultimately making agility difficult if not impossible. The concept of assemblage builds on the wide-spread use of informal networks to get things done. Thus, it is suggested that a more formal or institutionalized concept of assemblage will enhance the existing reliance upon informal and spontaneous bottom-up collaboration/coordination, building on convergence as a formal top-down governance mechanism and more permanent types of inter-operability arrangements.[14]

The earlier presentation of wicked problems served to illustrate that the types of social messes that will require government-led comprehensive approaches will necessarily require the application of novel and creative ways to frame the issues and consider how to address them. This perspective highlighted that it is not possible to resolve wicked social problems through traditional responses of rational analysis leading to appropriate planning and direction. The key is not in the managerial steps usually taken to solve the problem but in the intellectual processes used to understand what the plausible problems might be. While the literature on wicked problems helps redefine the 'what' of the problem space, this discussion of convergence and assemblage is intended to redefine the 'how' of tackling these problems. Equally important, the

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[12] Noting again, the earlier description of collaboration as a creative process to achieve something that did not previously exist.

[13] As well as the capacities for independent reasoning and highly effective negotiation skills.

[14] Returning to the introductory comments that traditional hierarchy with a 'boss' as decision maker is not necessarily required to allow individuals to work together.

understanding of the emergence of a new mode of knowledge production implies that the dimensions of knowledge which we have discussed as techne and phronesis are increasingly important to enabling people collaborate in the shaping and sharing of knowledge and for the implementation of convergence and assemblage.

Rather than focussing on trying to extend the traditional functions of planning, organizing, delegating and controlling from one organization to many, this discussion has suggested that the key convergences that are required are intellectual and cultural and that the most important organizational responses will be those that facilitate more open systems and structures, in other words, the antithesis of classic administration. The issue of creating the conditions for these types of convergences to occur leads to the examination of the governance of the commons in the next section as well as, with the caveat on the requirement to still test these hypotheses to determine how these may inform specific research questions, leads to the second of the speculative hypotheses offered:

Hypothesis: Failure to recognize the 'deeper' elements of convergence pertaining to worldviews, taken-for-granted assumptions, new modes of knowledge production and epistemologies will result in over-attention to the lower order functions of facilitating cooperation, providing coordination and exercising managerial control as well as lack of attention in establishing the conditions for the creativity needed to address wicked social issues.

2.4   CONVERGENCE AND GOVERNANCE OF THE COMMONS

The discussion of the nature of convergences that may be required to address wicked social problems clearly extends beyond simply coordinating the work efforts of the many but expands into broader interactions. In the context of comprehensive approaches, convergence and assemblage enable more intense forms of inter-organization co-dependence, cooperation, and collaboration. These more intense relations are also more dynamic and provide the 'requisite internal variety" to responsively adapt to a more dynamic and turbulent operational environment (Bar Yam, 2006; Verdon et al 2009). This, in turn, can lead to the development of an organizational and inter-organizational commons. Commons could be the collective depositories of knowledge – e.g. wikis, and/or pools of human capabilities (e.g. 'cloud-labour' and 'talent-commons') from which crowdsourcing can enable powerful surge capacities and/or new ways of designing how some types of work can be accomplished. Other forms of commons could also be considered such as equipment, facilities and accommodations, etc.

Of course, with the concept of a commons comes different management issues (Ostrom, 1990; Ostrom, 2002). Originally coined to describe the management of natural resources, the concept of a commons pertains to any condition where individual can share scarce resources and, in particular for this paper, knowledge and ideas (Hardin, 1998). Key in the notion of intellectual convergence is the pooling and sharing of different ideas, worldviews, perspectives with the possibility of creating new ways to understand wicked social problems. To extend Hardin's (1968) 'tragedy of the commons', a challenge is that it is likely in each individual and each organization's best interests to extract as much knowledge as possible while contributing the least possible (under the philosophy that knowledge is power).[15] There is a long tradition of humans developing diverse institutional arrangements for the governance of common resources and avoiding system collapse (although the tragedy of the mis(un)managed commons remains salient

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[15] And, by extension, that these issues will be heightened when the individual or organization has a large investment in the shared enterprise.

as a concern). Ostrom (1990) has identified eight design principles that can help to maintain a stable local common resource pool:

- Clearly defined boundaries that effectively exclude external and unentitled parties;

- Rules for appropriation and provision of common resources that are adapted to local conditions;

- Arrangements for collective-choice that allow participation in the decision-making process;

- Effective monitoring and accountable to the participants;

- A scale of graduated sanctions for violations of community rules;

- Mechanisms for resolving conflict should be inexpensive and easy to access;

- Community self-determination is recognized by higher-level authorities;

- As commons become larger – organization occurs in a form of multiple layers of nested enterprises beginning with local participants at the base level.

To sum, while the focus of convergence is on the common goal to be achieved, it is important to examine the number and range of other issues that are necessarily involved including:

- The compromises that must be reached to enable convergence;

- Issues of how differences in dominance/power between organization and the implications for resulting cultural-organizational conditions such as integration, assimilation, separation or marginalization;[16]

- Issues related to the impact on organizational cultures shaped by entrenched and relatively rigid hierarchical structures and histories;

- Issues related to simultaneous competition (and possibilities of co-option) regarding interests outside the domains of convergence;

- The need for a 'window' to open to enable convergence including the presence of entrepreneurial actors, and

- The need to assess the opportunity costs of investing resources in the common goal versus other goals of value to the specific organization.

This discussion of the governance of the commons provides valuable perspectives on how to create the conditions that enable and sustain the types of intellectual and cultural convergences needed to address wicked social problems. With the conditions of convergence in place, assemblage represents the agile and effective use of the commons as and where they are needed by many that doesn't misuse or deplete them. The requirement to fully appreciate the implications, and the obstacles, to setting the conditions for multi-organizational team success in resolving wicked social messes, leads to the next major area of consideration as to the different forms of organizing the activities needed however this discussion of the governance of the commons suggests the next yet to be tested speculative hypothesis:

Hypothesis: Even when the benefits of coming together in convergences are clear, the logic leading to the 'tragedy of the commons' suggests that there will be powerful, personal reasons why individuals will engage in actions that will enhance their own objectives at the detriment of the collective

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[16] Drawing on Berry's seminal work on acculturation in the context of cross-cultural psychology.

3 OPTIONS TO DEAL WITH WICKED PROBLEMS AND CONVERGENCE

3.1 INTRODUCTION

The initial discussion sought to examine the problem space that is requiring the use of government-led comprehensive approaches by considering the nature of wicked problems and the requirement for various convergences. The primary conclusion is that resolving complex social messes requires unique combinations of individuals, groups, ideas, worldviews and intellectual models. The challenge, of course, is that these temporary, 'unique combinations' need to be created from existing systems and structures and, as these will be government-led initiatives, need to be based largely on the dominant methods used by governments. As identified in the literature on public administration, governments have increasingly adopted highly bureaucratic approaches which are based on addressing routine, normal, tame issues.[17] This section will examine the dominant approach of the bureaucratic organization and then will consider two alternative approaches: professions and complex adaptive systems in order to consider what type of 'unique combination' needs to be established to best cope with social messes.

3.2 ORGANIZATIONS OR ORGANIZING HOW 'WORK' GETS DONE

Whether in the private or public sector, most people who have a job conduct their daily work within a relatively common set of parameters. Their particular job is normally part of a defined work unit nested within a specific organization that has clearly defined boundaries particularly regarding the organization's purpose, core business and workforce. They usually have a good understanding (written or verbal) as to the duties they must perform, their conditions of work, the policies and standards that will be applied to determine both what they are to achieve and how they are to do so as well as the direct or indirect consequences of good or poor performance. Most have a direct supervisor who is authorized to provide them with direction regarding their work, to evaluate their performance and to correct their actions when deemed to be contrary to organizational objectives, policies or standards. Their supervisor, in turn, normally reports to somebody at a higher level of responsibility and authority who, in turn, reports to somebody higher up with those at the most senior level (CEOs, Deputy Ministers or the Chief of Defence Staff for the CF) subject to some form of oversight either through the combination of cabinet and parliament in the case of government or of a board of directors and shareholders in the case of many private sector firms. Together these common elements of specified duties, rules, reporting relationships etc provide a high degree of structure which enables various business activities to occur in a generally organized manner to ensure, first, that what is achieved/produced/created is consistent with the goals and objectives of the organization; second, that the way this occurs optimizes efficiency and effectiveness; and, third, that those in positions of responsibility can exercise necessary control to either initiate new actions or amend existing ones. Similarly, from an individual level, the structure provided through these common elements provides sufficient clarity as to their individual role and responsibilities that they can often conduct the vast majority of their work with minimal supervision or requirement to seek direction.

These core principles of how to organize 'work' emerged in the Western world with the evolution from an agrarian to an industrial basis for the production of goods and started to be articulated over a century ago with the birth of scientific management and the subsequent 'modern'

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[17] Amongst others who comment on the adverse effects of 1990s government reforms see Clark & Swain's critique as well as Gow & Hodgetts' reminder of lessons learned from the past.

understandings of the functions of administration and bureaucracy.[18] It should be noted that a primary objective of Fredrick Taylor, the 'father of scientific management' was to replace the medieval, guild system (whereby each artisan worked independently to decide how to produce their goods) with a system of standardization of production. While his focus was to increase productivity, efficiency and profits, the net result was to move initiative and decision making from the artisan/worker to the manager. Starting about 60 years ago, academic research and practitioners recognized/rediscovered the importance of the human element in the world of work and, in particular, that it was neither effective nor desired to place individuals in contexts in which they were neither expected nor authorized to use discretion on the job.[19] Over time, the concepts of scientific management with its focus on the processes used to perform tasks efficiently were gradually amended or expanded to also include an understanding of the social dynamics which also influenced how people conducted their work.[20] However, the core principles of Taylorism with a reliance on managers using rational decision making to ensure workforce efficiencies remains a dominant facet in how work is typically organized and conducted.

As a result of this evolution over the last century or so, the functioning of any organization can be represented by an integration of formal structural systems (bureaucracy) and informal social systems (the human dimensions). Formal structural systems represent those elements that are intentionally created and assumed to operate on an objective, linear, rational basis to achieve efficiency. Conceptually, structural systems are created as mechanical like entities to produce the work force characteristics that are deemed needed to achieve pre-determined ends. In this paper, we see work force characteristics as what a work unit (the combination of allocated people and resources along with unit-specific rules and policies) is designed to achieve. On the other hand, social systems represent those elements that are emergent and operate on a combination of cognitive and affective bases to achieve those outcomes (ends) using those processes (means) that are valued by the individuals and groups that belong to the social system(s). In this way, the product of social systems are the potential capacities represented by teams, networks and/or communities. In contrast to work force characteristics (what a unit is intended to achieve), capacities represent what a unit can actually achieve. Generally these social capacities operate outside of the 'job descriptions' and represent informal adaptations meant to compensate for structural inadequacies. As well illustrated in the military literature, under certain conditions such as transformational leadership, high morale and strong task cohesion, a unit can achieve far more than it was designed to achieve while in the absence of these moderators, other units can fail to meet even minimum performance standards. Of importance, the constellation of norms, beliefs, expectations, etc that emerge from the social systems are often referred to as organizational culture, a concept that will be expanded in subsequent discussion.

As it is a combination of the structural and social systems that will determine what gets done and how, it is important to consider how each is controlled. The function used to operate the structural component of an organization is management while the function used to influence the social component is leadership. It is useful to separate these two functions in order to think about them, however, in real world settings, people embody both functions in various degrees and competencies. The primary basis for the exercise of management is role-based authority while the primary basis for leadership is social influence derived from a combination of position-based

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[18] Without getting into lengthy discourse on the issue, the focus on the economic advantages of specialization and the division of labour can be seen in writings by Adam Smith and the strong critique of the resultant alienation of the worker in those by Karl Marx.
[19] The recent discourse on the creation of the 'knowledge worker' is, in fact, a repudiation of Taylorism.
[20] The seminal work on the open socio-technical systems was presented by Emery & Trist in 1965.

and personal power. Both authority and social influence are much more effective when seen as legitimate and legitimacy is a component of the authority and power attached / ascribed to organizational position and role.

A key point in any consideration of the common hierarchical organization is that the individual is provided with significant amounts of structure or, more specifically, certain limits on the amount of discretion, initiative or creativity that they can use in getting the job done. The normal functions of management (planning, organizing, delegating, controlling) along with common human resource activities (job analysis, job descriptions, performance appraisal, succession management, etc.) are all premised on a taken-for-granted assumption that those appointed to higher positions in the hierarch have greater power and authority to make decisions concerning the work and work environment of those who work for them. Even the use of participative decision making styles or workplace teams are embedded within structures (rules, regulations, reward systems, etc) that constrain what any one individual may or can do: others (somewhere, somehow) have already set the conditions within which the individual is then allowed to exercise a degree of independence. Thus, when considering the typical organization, it is important to recall that both management and leadership are best thought of as structured or control-based.

Noting that the concept of command as practiced in the military will be discussed later, we offer a more conceptual way to view the management – leadership duality:

- Management arises in organizations to provide direction for the orchestration of control within a relatively static structure (even in situations of transforming structure it is conceived of as a movement from one static to another static structure). Thus management functions as a mechanism's governor/thermostat keeping the system operating within optimal parameters, or as the organization's engineer, constantly tinkering to optimize the mechanism.

- Leadership arises in situations to provide necessary inspiration to elicit intrinsic motivation to align behaviour and accept/offer accountability. Thus leadership functions more like a strange attractor – a rallying point for human motivation and will to 'self-organize' into socially cohesive patterns of action[21]. On a psychological level, leadership functions as a sort of transparent situational information index[22] or, if we seriously consider our discussion of techne and phronesis, then a leader can function as a transparent aggregation of situational knowledge (TASK), enabling the more dynamic psycho-social self-organizing of individual and group motivation willing accountability (most especially in stressful, uncertain, and dangerous situations). In this way one can understand leadership as a collective and distributed activity.

While the exercise of management and leadership is most directly based on organizational policies, rule sets and norms, these are also more generally informed by broad differentiated ideologies (Friedson, 2001). The capitalist or market ideology is focussed on profit, ruled by supply and demand and draws on the division of labour to ensure goods are produced efficiently. The bureaucratic ideology is focussed on control, ruled by management and draws on regulatory systems to ensure work is conducted according to set rules. The professional ideology is focussed on socially institutionalized outcomes, ruled by values determined by expert association and draws on the shared vocational ethic to ensure that the desired social good is achieved in a manner consistent with professional norms. As an extension, a community/communal ideology is

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[21] To paraphrase Dave Snowden's comment on knowledge management (that knowledge cannot be coerce it can only be volunteered); leadership calls to motivation and will in the same way – they also cannot be coerced but only volunteered.

[22] Below we will discuss in more detail the abstract concept of a 'transparent aggregation of situational information' (TASI) which is meant to convey a fundamental mechanism that enables systems of autonomous agents to self-organize.

focused on socially desired outcomes, ruled by members and draws on the power of consensus to ensure that outcomes are achieved in a manner consistent with the expectations of the stakeholders. Both the professional and community ideologies place a high emphasis on maintaining broad public confidence and trust by reflecting values endorsed by the broader society so as to ensure legitimacy in the eyes of the citizenry. What is also important in these two ideologies is a clear form of governance that includes rules about changing the rules.

As expanded in other work, there are significant differences in the dominant ideology between the public and private sector as well as between the public service and the military within government (Bentley, 2005; Okros, 2009). Of importance, the military seeks to emphasize the professional ideology while concurrently being required to operate within the broader government bureaucratic ideology. As an extension, it is considered that those state-based agencies that are focussed on providing unique social services/goods based on the practices of a recognized profession (e.g., medical, legal, military) are considered to be manifestations of institutions that are part of the fabric of civil society and the state. Institutions represented by government supported agencies contain both organizational facets focussed on functional imperatives and professional facets focussed on social imperatives (noting there are other economic and sociological meanings attributed to the concept of institutions).

This discussion of organizations presents several factors that are considered of relevance when considering comprehensive approaches. To link several ideas together, it is important to recognize that, most often, the dominant approach of classic organizations to ensure the right work gets done the right way, is to use managerial approaches to alter the structural systems. To return to the quotation from the de Coning (2009) Norwegian study, this results in an over-emphasis on formal (top-down) control mechanisms such as articulating a clear strategy, specifying outcomes, allocating resources and issuing direction to subordinate managers who, in turn, will direct and control work done at levels below them.[23] Unfortunately, the fact that wicked social messes cannot be accurately defined hence cannot be addressed through linear methods along with the requirement for disparate groups, ideas, worldviews and norms to converge on the issues suggests that the primary method for those in charge to set the conditions for the combined group's success will be through the exercise of leadership to influence the social systems at play. It is this logic that suggests why facets of organizational and group culture are identified as of important and leads to the next discussion as well as the following to be demonstrated speculative hypothesis:

Hypothesis: When it is observed that a comprehensive initiative did not achieve the results intended, the post-event analyses are likely to show that there was a heavy reliance on managerial techniques to provide planning and direction via structural systems and inattention to the exercise of effective leadership to influence key social systems.

3.3   ORGANIZATIONAL CULTURE

Organizational culture is considered to be the constellation of workplace-specific perceptual filters (worldview, values, beliefs, assumptions, expectations, myths, narratives, etc.); practices (norms, conventions, behaviours, customs, rituals, artefacts etc) and structural factors (processes, incentive frameworks and structures, power-based relations, roles and responsibilities etc.) that influence how individuals and groups come to understand, function in and master (or not) their work world. Organizations tend to have multiple sub-cultures and large organizations can be

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[23] See the Australian *Connecting Government* for a good discussion of the options to integrate top-down and bottom-up processes.

characterized as being composed of many clans and tribes based on many factors (such as occupations and functional work). Organizational culture is influenced by both internal factors within the organization and external factors drawn from the larger communities in which the organization, its functions and its members are embedded. The aspects of organizational culture that are of specific importance at any one time will vary depending on the context and assessment of these factors at a particular time can be represented as 'organizational climate'.

Generally speaking, culture provide a strong yet informal framework to guide how individuals' understand the world around them thus influences how and why people perceive, reason and behave. Further, culture is best understood to be 'as lived' or 'as experienced' rather than as intended – the domains of the tacit knowing of techne and phronesis. Finally, organizational culture(s) tend to evolve slowly as they are derived from what is commonly held and widely shared amongst the members of the organization. These factors are of importance when considering the shift from working within one's own organization to work in a multi-organizational context. Individuals will have to work in proximity with those from other organizations hence from other organizational cultures. Further, as already noted, the requirement for government organizations to engage socio-political systems to address wicked social problems means that they will have closer connections to external communities with vested interests thus these others will have increased influence on the organization's internal culture(s). Those who shift from working in a closed organizational context to working as part of a multi-organizational team are highly likely to encounter cross-culture confusion. The concept of a liminal state suggests all participants having to adapt to work under conditions of convergence will face issues of ambiguity particularly regarding identity, status and the group's emergent worldview(s) and accepted practices. Discourse analysis suggests that organizations with different cultures find it difficult to achieve a negotiated order because they will, at times, fail to share the symbolic meaning of the common terms they use.

As reflected in the range of disciplines that address culture, there are a number of different frameworks for unpacking elements of culture. Beyond the generalized models of organizational culture such as Schein or national culture as applied to organizations such as Hofstede (1980),[24] a useful model to consider cross-organizational contexts pertains to the differences between loose and tight cultures (Pelto, 1968). Tight cultures tend to be characterized by:

- Homogeneity with clear boundaries as to who is a member of the culture (and who is excluded) and a strong single identity for all members;

- Explicit social norms and associated standards of appropriate behaviour with severe sanctions applied to those who deviate from these norms;

- Clearly differentiated and stratified role requirements (father vs mother, manager vs supervisor vs labourer, etc) with a high level of role obligation (requirement to fulfill role requirements and to do so in a way that is consistent with the role and social norms);

- An emphasis on the subordination of one's own interests (or perspectives) to the good of the overall group often incorporated in a common prototype of the 'good citizen' as one who makes personal sacrifices to contribute to an overarching goal;

- A concern for clarity in language, rules and social regulation with limits on the articulation of contrary viewpoints or acts of disobedience; and

- A reliance on history, customs and traditions to reinforce key themes and to ensure cultural continuity and stability over time.

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[24] It is noted that other researchers who are part of this overall research project are working more directly with Hofstede's categories as well as being informed by Schein's thus the rationale for not presenting these in detail and opting to provide the alternate tight vs loose culture framework.

Loose cultures on the other hand are seen as very much the opposite in many of the key areas. They tend to be characterized by:

- Heterogeneity with a general philosophy that it is the individual who determines whether they are part of the larger group and acceptance that individuals may have multiple or poly-morphic identities;

- Flexible social norms and standards of behaviour shaped by the idea that one does not impose their own norms, values or standards on others (thus, an acceptance of diversity in various forms);

- A lack of emphasis on roles and role requirements with few status distinctions or role-specific obligations;

- An emphasis in citizenship and ones' obligations to others on maximizing the benefits to all hence the concept of 'good citizen' as one who voluntarily makes a contribution to other's wellbeing, quality of life or community initiatives;

- Acceptance of ambiguity and the likelihood of miscommunication and misunderstanding with the obligation of each to understand the other's perspective; and

- An expectation that societies and social norms will evolve hence an orientation towards the future as something to be created rather than a past to be preserved.

This discussion of organizations and organizational culture presents several factors that are considered of relevance when considering comprehensive approaches. To link several ideas together, the most important is to recognize that, most often, the dominant approach of classic organizations to ensure the right work gets done the right way is to using managerial approaches to alter the structural systems. To return again to the quotation from the de Coning (2009) study, this results in an over-emphasis on formal (top-down) control mechanisms such as articulating a clear strategy, specifying outcomes, allocating resources and issuing direction to subordinate managers who, in turn, will direct and control work done at levels below them. Unfortunately, the fact that wicked social messes cannot be accurately defined hence cannot be addressed through linear methods along with the requirement for disparate groups, ideas, worldviews and norms to converge on the issues suggests that the primary method for those in charge to set the conditions for the combined group's success will be through the exercise of leadership to influence the social systems at play. As noted in the evolution of leadership models, creating the conditions for individuals to be comfortable in 'loose' cultures requires a shift from leaders as decision maker to sense maker.[25] Noting that the following sections will explore new organizational concepts to facilitate greater human creativity, this discussion suggests why facets of organizational and group culture are identified as of importance and leads to the speculative hypothesis that:

Hypothesis: In order to work effectively with others under comprehensive approaches, those organizations that have tight cultures will have to adopt elements of loose cultures including flexible norms; accepting ambiguity and uncertainty; and, living with fuzzy roles and values.

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[25] With the additional observation that generational research is showing that those currently entering the workforce, the "Millennials" are much more comfortable in loose cultures hence this may be more an issue of the more senior (older) members of the workforce. See the 2010 Pew Research Center report for a detailed portrait of the Millennial cohort.

3.4   REFRAMING STRATEGY AND ORGANIZATIONAL ARCHITECTURE

A primary purpose of organizations is to create and focus the capacities of the workforce. To do so, senior managers spend significant time providing strategic direction and creating controlling mechanisms to ensure their direction is implemented correctly. Thus, organizations rely heavily on elements of the structural systems such as authorities, formal direction and the embedded incentive/reward systems to ensure that leadership is developed and oriented to support organizational goals. Institutions can be understood as a scaffolding which shapes human interaction and consists of material capital and human capital.

> *All organized activity by humans entails a structure to define the 'way the game is played,' whether it is a sporting activity or the working of an economy. That structure is made up of institutions – formal rules, informal norms, and their enforcement characteristics (North 2005, p 48).*

The material capital includes all humanly accumulated physical artefacts including the tools, techniques, and instruments (technologies) enabling control of their environment. Human capital includes the stock and, more importantly, the flows of knowledge possessed by a society especially as embodied in the beliefs and values held and the institutions created to reflect such. Change in the institutional framework is generally incremental due to constraints that the past imposes on the present and the future.

> *Institutions are the rules of the game, organizations are the players; it is the interaction between the two that shapes institutional change (North 2005, p 59).*

At minimum an institutional framework consists of:

- Power structure specifying decisioning and governance;

- Property rights structures that define incentives; and

- Social structures – norms and conventions defining informal incentives

The institutional framework is a human made creation whose function is neither automatic nor 'natural' and it must adapt to changes in technology, information and human capital in order to continue to function optimally. By extension, we posit that social messes cannot be addressed solely by organizational management and leadership nor by the application of a market approach. While it can be argued that the primary purpose of those professions that operate within government or within the boundaries established by government is to address social messes, it may be equally the case that the existing institutional framework may not be sufficient to enable these professions to in fact be able to address these emerging wicked problems. Therefore the concept of convergence and assemblage may also require concerted effort to augment the existing institutional framework. This section will start to do so by critiquing decision making and control then discussing the concepts of heterachy and responsible autonomy.

A key implication of the discussion present so far is that managerial decision making within a classical organization is not likely to be conducive to creating effective comprehensive approaches to address wicked social problems. Noting that the following two sections will present some radical alternative to the organization as the central model, this section will stay within the confines of the organization to provide some ways to reframe two of the problematic facets: decision making and control architectures.

Traditionally, managerial decision making is seen as a component of developing and implementing a strategy. While there is significant debate in the professional military literature on the concept of strategy, these are almost always based on the acceptance that the purpose of strategy or strategic decision making is to align ends, ways and means. Others, however, have

challenged this basic assumption. Mintzber and Waters (1985) distinguish between deliberate and emergent strategies. Emergent strategies are the result of 'unintended strategic order that can arise despite the clear absence of deliberate planning and design. Such strategies arise from the unintended consequences of human action and interaction. In fact many of our social institutions (including political structures, money, legal systems) have emerged in an unplanned and undirected way. As Chia and Holt (2009) note:

> *In seeking to explain individual, corporate and societal accomplishments there is no need to invoke deliberate intention, conscious choice and purposeful intervention. Collective success need not be attributable to the pre-existence of a deliberately planned strategy. Rather, such success may be traced indirectly as the cumulative effect of a whole plethora of coping actions initiated by a multitude of individuals, all seeking merely to respond constructively to the predicaments they find themselves in. (p x)*

As military strategist Basil Liddel-Hart (quoted in Chia & Holt, 2009) suggests, direct approaches can often provoke determined opposition and resistance. Indirect action on the other hand may be effective because action is oblique, peripheral. Thus a paradox arises such that the more directly and deliberate a particular goal is 'single-minded' pursued, the more likely it is that the calculus of actions involved will eventually undermine and erode the achievement of the intended strategy making initial successes unsustainable, and possibly eventually result in devastating consequences. Chia and Holt suggest that the entire domain of strategy is infused with a 'paradoxical logic' making necessary the development of a completely different mode of comprehension and means of engagement that moves away from primary reliance on an instrumental rationality. These authors suggest that strategy is much less about the actions of navigating than it is about sense-making and way-finding. This approach is very appropriate to resolving wicked problems which tend to unfold and where each movement reconfigures the problem and solution space and gives birth to new 'adjacent possibles', such that we can only 'know as we go'.

> *The idea of strategic design informed by rational assessment and realized in clear execution becomes a conceit of those unable to appreciate the potential of a life lived outside the confines of the intellect and unwilling to acknowledge the debilitating emptiness of always seeing the world head-on. It is, we suspect, time for strategy without design. (p xi).*

This quote may overstate the case, but the point is that many purposefully pursued strategies and decisions derive their ultimate success because of the ground of continual and ubiquitous informal adaptation by all actors involved.

The related, second concept presented is that, regardless of how strategy and decision making are understood, the primary means to implement a strategy is via some means of control which explains the basic issue of why organizations are structured as they are (Fairtlough, 2007). A commonly accepted reason why organizations exist or, as Ronald Coase (1990) labels it "why people are gathered under one 'umbrella' to get things done", was the need to minimize 'transaction costs'. By sharing purpose and dividing labour through establishing roles, responsibilities and methods of communication, it is easier to get things done. However, one of the consequences in Coase's[26] model of a firm arising because of the constraints of transaction

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[26] In his Wired Magazine article "In the Next Industrial Revolution, Atoms Are the New Bits" Chris Anderson quotes Bill Joy as the source of this flaw in Coase's model. http://www.wired.com/magazine/2010/01/ff_newrevolution/all/1 . According to Coase, in a perfectly

costs (including search, coordination and communication) is that no matter who one is, most of the smartest, most competent people work elsewhere. Before the Internet, this was less of a concern because one was limited to the people available locally (Benkler, 2006; Verdon et al, 2009). As the Internet becomes ubiquitous and applying knowledge becomes more important to success than performing physical tasks, the need to structure organizations to harness human effort by gathering people locally, is perhaps unduly restrictive.

Authors examining the implications of increased connectivity and the role of the knowledge economy argue that the purpose of organizational architecture aimed at minimizing 'transaction costs' must be re-evaluated since the traditional approach to organization human/collective efforts may now impose higher transactions cost than other structures mediated through digital networks. In 2000, many considered the Internet a fad. Today, despite being only about 6,000 days old, [27] it is clear that the world is in the midst of a phase transition of connectivity as the Internet instantiates a digital ecosystem. However, the next 6,000 days should bring even more dramatic change, both positive and negative. In fact, the emerging digital ecosystem and social media remain a type of wild west full of both promise and danger, of new unexplored territory both fertile and enabling all manner lawless behaviour where each individual has more power to do ill. However, for good or ill, the Internet and emerging social media capabilities represent new modes of production and enabling architectures of participation. Organizational architectures now require new sets of rules shaping more appropriate institutional and governance frameworks. This arises as a result of the unprecedented collapse of traditional costs associated with transactions, search, communication and coordination that were the fundamental economic rationale for traditional methods of organizing the large collective and collaborative efforts of people and organizations.

This phase transition is engendering a shift in concepts about organizational structure and human development including:

- From Place-Centric to Person-Centric world;

- From Training to Learning-How-To-Learn;

- From Authority-Down to Bi-Directionality;

- From the Transfer of knowledge to Knowledge Co-Creation;

- From Orchestrated to Emergent Capabilities;

- From Individual Learning to The power of Real-Time Collective Learning;

- From Individual Intelligence to Intelligence Amplification and Collective Intelligence

A Pew Internet & American Life study found that more than 50% of all teens have created media content and about 33% have shared this content. Jenkins et al (2009) refer to this rapidly growing phenomena as participatory cultures. A participatory culture is a culture with relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing creations, and some type of informal mentorship whereby experienced participants pass along knowledge to novices. In a participatory culture, members also believe their contributions matter and feel some degree of social connection with one another.

Jenkins outlines four forms of participatory culture:
- Affiliation – formal and informal membership in online media communities such as Facebook, forums, and metagaming or game clans.

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efficient market there would be no reason for the firm to arise other than the psychological one of people liking to lead or liking to be led.

[27] For a fascinating and brief presentation on this idea, by Kevin Kelly see:
http://www.ted.com/talks/kevin_kelly_on_the_next_5_000_days_of_the_web.html

- Expression – the production and sustainment of new creative forms such as sampling, mash-ups, game mod-ing, fan video/fiction & zines
- Collaborative problem solving – formal or informal team work to complete task and develop new knowledge such as Wikipedia, and engaged activism
- Circulation – producing, shaping, sustaining, enhancing flows media such as podcasting, blogging and twittering.

As will be developed in the subsequent discussion of complex adaptive systems, hyper-connectivity has many implications including: the growth of creative engagement, participation and collaboration, as well as the growth of new forms of techno-dependency. A more radical development has been called the participatory panopticon, where everyone can see everyone else.[28] The participatory panopticon represents an emerging capacity for the transparent aggregation of situational information (TASI) – vital to effective self-organization, which will be discussed further in the section on complex adaptive systems (CAS).

The wicked problem for security is the challenge of preserving a free and open society while developing an internal space for richer, more *agile cloud-labor and talent-commons* providing 'just-in-time' group-forming and peer collaboration within and between organizations. This would increase the capability to search a larger solution space, enable knowledge to flow and increase human and social capital and trust. These critical factors set the conditions for current and future operational agility (Albert and Hayes, 2003). The benefits include:

- Reduced transaction, search, coordination, control and opportunity costs (time, effort, people, capability) – more teeth less tail.

- Integrated continuous learning, to power more effective operational agility.

- Improved incentives for, and harnessing of, intrinsic motivation engendering greater commitment.

- Increased pool of available skills, knowledge and judgment that can be brought to bear – enabling organization to better marshal its human capability/capital for productive and operational ends.

- Improved generation of integrated security solutions.

The result of this phase transition should be a new organizational paradigm that enables *the right person to be connected to the right situation at the right time*. The ubiquity of the frame of hierarchy makes it seem as 'The' natural and only way to organize against anarchy. There are alternatives: Heterarchy and Responsible Autonomy. Table 1 below developed from Fairtlough (2007) outlines these 'three ways things get done'.

Table 1: Continuum of Organizational Architectures

Culture is Structured by the Conventions of Coordination	
Centralized	**Decentralized**

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[28] One can see early signs of this in examples such as the 'Rodney King tapes', the use of twitter recently in Mumbai and even the 'dog-poop girl' (see in the article "Internet Vigilantism" http://en.wikipedia.org/wiki/Internet_vigilantism). More recently, during the Haiti crisis the US forces were able to use the 'twitter-stream' and the 'blogosphere' as well as satellite imagery, and new software capabilities such as "Ushahidi" to determine who/where help was needed, what the local conditions were and who else was in the environment.

Control Hierarchies	Heterarchies	Responsible Autonomy
Traditional Military	Partnerships & Consulting Firms	Free Markets
Government and Corporate Bureaucracy	Research Universities	e-Society and the Internet
	Political Democracies	Special Operations Forces

Alternate architectures allow organizations to move beyond the hegemony of control hierarchy and organization-as-machine. We present two simple definitions of heterarchy and responsible autonomy:

a. **Heterarchy** – rule or control shared by many not exercised by one thus a balance of powers instead of single rule, the idea of shared rule is very old, for example in partnerships; and

b. **Responsible Autonomy** – individual or group autonomy to decide what to do. Responsibility as accountability is not anarchy. The very word responsible implies connectedness; one could just as easily understand the term in the sense of connected autonomy or accountable autonomy.

As Table 1 indicates responsible autonomy requires a corresponding organizational architecture such as a market system or a network structure with a participatory architecture. These concepts of Hierarchy, Heterarchy and Responsible Autonomy are consistent with the concepts of leadership outlined in "Leadership in the Canadian Forces: Conceptual Foundations"[29] but are seen as extending well beyond the confines of the military concept of mission command.[30] More specifically, the document's discussion of the need to balance control with creativity is incorporated through the use of Robert Quinn's Competing Values model organizational effectiveness.[31]

This discussion of alternate views on strategy and architectures builds on the previous discussions of wicked social problems and requisite convergence as new forms such as heterarchy or responsible autonomy is focused on enabling human creativity and initiative by facilitating an easier or unrestricted flow of knowledge. The following sections will present alternate models which do not rely on the organization per se however this discussion leads to the speculative hypothesis that:

Hypothesis: In order to facilitate the flow of knowledge and ideas necessary to address wicked social problems, organizations will need to shift their decision making framework and enabling architecture to adopt more open systems and focus on creating knowledge rather than reducing transaction costs.

3.5   PROFESSIONS

To build on the brief introductory comment, professions are socially constructed institution thus an understanding of what is meant by a profession, with its associated social positioning and how that is interpreted, is informed by historical, cultural and ideological influences. The classic

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[29]   This idea is reflected in the general leadership model presented and specifically in the concept that a main purpose of the higher level "Leading the Institution" function is to set the conditions for unit/team success.

[30]   See Pecher (2008) for an excellent presentation of mission command philosophy in the military including origins, current application and future implications.

[31]   As incorporated in the CF doctrine, both control and creativity are required, the key is striking the right balance. See Quinn & Rohrbaugh (1983) for further implications.

professions: medicine, law and the clergy significantly predate the industrial era and the subsequent creation of organizations as described above.[32] As indicated in the brief discussion earlier of dominant ideologies, in comparison with either the market or bureaucratic ideologies which operate very nicely in a classic organization, the professional ideology puts a very different emphasis on who and what are of importance and how the profession is practiced. The following are key characteristics that define professions.[33] Professions are seen as an exclusive group of people who provide a unique service to society by resolving complex problems involving a societal good. They do so by applying a theory-based body of knowledge which is mastered through a lengthy process of formal education and supervised practice. Professions serve the common good and have the obligation to society to do so competently and objective. Thus, professionals are seen to work primarily for the benefit of society not mainly for monetary gain. Further, professions use a code of ethics to guide decision making in complex, novel or ambiguous circumstances. There are two key facets to the code of ethics and decision making. First, the values contained in the code of ethics must be accepted as legitimate by the society or societies the profession serves. Second, each member of the profession is expected to internalize the code of ethics and to exercise independent moral judgement as to the right thing to do in complex contexts. To be able to do so, beyond periods of formal education and supervised practice, individuals are also normally developed through professional socialization. Finally, professions often have a fair amount of autonomy in regulating professional practice as a result of their professional knowledge and need for moral/ethical judgement.

Deriving from these characteristics, professions can be defined by five attributes. The first is Jurisdiction as the field or the function over which profession has, and has been acknowledged by the larger society, control or, at a minimum, primacy.[34] The second is Expertise or the theory-based body of specialized knowledge, skills and practices that is gained through education, training and experience. The third is Responsibility in which the profession and each member accept special duties to the society or societies they serve. The fourth is a collective Identity which includes unique status in society. Importantly, individuals see their membership in the profession as a key element of their sense of self. The final attribute is a shared Vocational Ethic which includes the values, beliefs, expectations and obligations that underpin ethical reasoning and professional practice. The vocational ethic most often contains two types of values: in short the 'how' and the 'what'. The 'what' are the outcome values regarding what is to be achieved (the ends) and the 'how' refers to the conduct values on how this is to be done (the means). To link to the previous discussion of organizational culture, the vocational ethic represents the espoused/ idealized professional worldview while the professional culture represents what is accepted/ lived on a daily basis. Signals to align the extant culture with the desired vocational ethic are often conveyed symbolically through customs, rituals, traditions, narratives and myth making.

Conceptually, the fact that each profession has the sole responsibility for a valued social good explains not only why it seeks to exercise a monopoly over their jurisdiction but also how and why they seek a high degree of autonomy and limits on other's providing similar services. What are referred to as contested jurisdictions can arise when a profession finds others entering their domain (Abbott, 1988). An example of an evolutionary contested jurisdiction dispute comes

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[32] The military certainly existed as one of the oldest forms of social structures however the creation of a profession of arms with the attendant characteristics to be described in this section certainly occurred after the initial three classic professions were established and, to a large extent, occurred concurrently with the rise of the business organization.

[33] For presentation of this approach with application to the profession of arms, see *Duty with Honour.*

[34] Of importance, the traditional role of government was to formalize and endorse the profession's right to practice hence authorize the profession to exercise exclusive control over their jurisdiction.

from medical profession with the gradual incursion of deemed non-professionals (homeopaths, acupuncturists, pharmacists, nurse-practitioners, mid-wives) increasingly offering medical treatment that had previously been only available from certified medical professionals.[35] An example of a more sudden clash of contested jurisdictions is evident in the case of the 'militarization of aid' with militaries moving into the humanitarian aid space.[36] While the military often assumes a common purpose (assisting local populations) thus wish to work with aid organizations, the humanitarian aid community is focussed on maintaining neutrality and impartiality hence would prefer (if necessary) concurrent but separate activities. Contested jurisdictions necessarily imply corresponding conflicts in the identities, expertise, responsibilities and vocational ethics in use. This issue can become especially acute when the domain of activity is to provide a valued service to society (e.g. health, justice, public safety, national security, education, etc).

While issues of contested jurisdictions can be interpreted as an intent to maintain a commercial monopoly (so called turf wars and protecting rice bowls), there are a number of deeper reasons why the dominant profession seeks to keep others out. A common concern is that external actors can confuse the public about who is doing what which is why there tends to be concerns when the non-professional others appropriate distinguishing symbols.[37] A related issue is that the profession often believes that the newcomers do not possess the other requisite attributes which are derived from the jurisdiction. Thus, there are concerns that they do not have the requisite expertise, assumed responsibilities, identity or make judgements based on the vocational ethic and, as a result, can easily cause harm rather than do good. A third is that professions tend to take a long term perspective both learning valuable lessons from the past and anticipating the challenges for their valued social good into the future. The SARS and H1N1 outbreaks serve as a good example from the medical domain with some aspects of the collective response informed by events as far back as the medieval ages Black Plague but also with the public's expectation that the profession should have anticipated these outbreaks hence have contingency plans in place to deal with them. Both emergency measures and the military provide other examples where the professional community recognized that it must be prepared for rare but plausible events even if not formally commissioned by government or endorsed by society to do so. It is the profession acting as the guardian of the social good that leads to the development of professional wisdom and also explains why some elements of professional practice are slow to evolve. As an extension, a concern is that those offering similar services based on a free market ideology may adopt approaches that are expedient and profitable (for the company) yet over time may erode the overall public good.[38] A related point pertains to resources including time, effort, money and political attention. As the profession assumes responsibility for a broad social good, a key facet of professional decision making pertains to the allocation of scare resources to ensure effectiveness across all areas of service.[39] The concern under contested jurisdictions is that the newcomers will focus on only one aspect of the professional domain and cause scarce resources to be misallocated.

This framework of five attributes of a profession illustrates many significant differences from the traditional organization as presented earlier. With its orientation toward a collective contribution to a social good rather than a corporate focus on profitability, the professional framework shifts

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[35] For an illustration in the US case, see Casalino's (2004) description of the clashes during the 'era of managed change.

[36] See Okros & Keizer (2007) for an application of this framework of professions to examine the contested jurisdictions between the military and the humanitarian aid community.

[37] The domain of policing, a common concern is when private security firms adopt similar uniforms, marking on vehicles etc; the same has occurred in the health professions when non-professions don white lab coats or drap stethoscopes around their neck.

[38] The Canadian debate on private heath care serves as a good example.

[39] The juggling act of prioritizing resources in the provision of health care is an excellent illustration.

the focus from the Taylorist efficient performance of specific tasks to a greater emphasis on exercising independent judgement in complex, ambiguous and dynamic circumstances. At a minimum, therefore, it provides a closer intellectual alignment with the approaches deemed valuable in addressing wicked social problems which, to a large extent, is no surprise as the generalized purpose of classical professions is precisely to deal with social messes. Noting that this discussion must now turn to consideration of how the individual fits within their profession, this presentation leads to the next speculative hypothesis.

Hypothesis: Those who approach wicked social issues using a professional framework will have greater success in understanding the complexities and implications than those who apply only a standard managerial decision making model.

3.6   THE INDIVIDUAL WITHIN A PROFESSION

While this framework of five attributes is often used to differentiate a profession from other organizations or society in general, it also helps explain how the profession functions internally, specifically how individuals relate to their profession and to each other. For example, while the profession's jurisdiction is intended to establish boundary conditions to define the domain of activity, there are almost always sub-divisions within the jurisdiction which provide the individual with an understand of their particular role and the roles of other members of the profession. Thus, while all share the same overall jurisdictional focus, the role of the Catholic Church Parish Priest is differentiated from that of the Bishop or Cardinal; the lawyer from the judge; the surgeon from the anaesthetist or surgical nurse, etc. The military is perhaps one of the most internally differentiated professions with multiple sub-areas of specialization (different military occupations) and hierarchical stratification (rank). In contrast to the bureaucratic model of organizations, it is expected that each member of the profession will have an understanding of the roles of others and, in particular, will learn how to work effectively with them to contribute to the collective professional service to society. To extend, depending on one's role (or sub-jurisdiction), the individual is expected to hold role-specific expertise, responsibilities and identity. Further, while it is assumed that all members of the profession hold the same vocational ethic, it is also understood that one can move through stages in personal, moral development to develop increased understandings and capacities to utilize the value set of the vocational ethic to exercise the independent judgement that is a hallmark of the professional ideology.[40]

To build on the idea of professional socialization, a central facet of mastering one's profession is learning to decode the symbolic meaning that is used to convey key information to other members of the profession. As an illustration, the symbols attached to a military member in full dress uniform is often referred to as wearing their CV as, taken together, these convey the individual's area of specialization, relative professional status, stage in professional development, professional certification(s), unique experience and, often, noteworthy contributions to the profession or nation. A challenge, however, is that it is usually only those who are in the profession who learn how to decode these symbols and members of professions rely on these as critical shortcuts to establish relative professional credentials especially when engaging in within-profession convergences. Thus, especially for military or medical personnel, two or more who have never worked together can establish in seconds 'who's who' and be able to start working together based on the (usually accurate) assumptions each can make about the other. To be expanded later when discussing command, what we will call 'swift professional convergence' allows teams from the

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[40] See Kegan (1982) and Kohlberg (1972) for the general models here and Lagacé-Roy & Wright (2009) for illustration with regards to the profession of arms.

same profession in urgent circumstances to reduce the amount of formal or explicit communication and to rely on a large body of shared, implicit meanings.[41] In the earlier discussion of organizational culture, it was stated that organizations with different cultures may find it difficult to achieve a negotiated order because they will, at times, fail to share the symbolic meaning of the common terms they use. This issue can become acute when dealing across professions as most rely on deeply layered meanings which are extremely difficult for the layperson to decipher and, more problematic, become so ingrained in day-to-day professional practice that they are difficult for the professional to explain to others.[42]

To return to the general model of profession, it is important to note that the five attributes are closely interrelated. For example, expertise is more than simply learning the profession's theory-based body of knowledge or acquiring specific technical skills but also requires that one understands how the use of this knowledge contributes to the profession's overall social good, how the responsibilities and identity of the profession inform what one does and, most importantly, how the values embedded in the vocational ethic are to be used to make independent judgement. In sharp contrast to the philosophy underlying Taylorism with its emphasis on learning how to perform set tasks very efficiently, the key issue is that the member of the profession must always make decision based not as much on how things are to be done but why. Thus, professional practice is informed by wisdom with those at the most senior levels responsibility for exercising stewardship over the profession and guiding individual members.[43]

To link to the point made in the earlier discussion of organizations and reference to the fact that both management and leadership in organizations are focussed on control and supported by high degrees of structure, the same applies in the case of professions however with key differences. While in both cases, the individual is provided with a high degree of guidance to inform them as to their role, duties and work expectations, however, the source differs significantly. In the organization this comes via individual managerial decision making (the boss) along with corporate 'staff' activities (job analyses, creating competency frameworks, etc.) and, in some cases, the use of adversarial procedures (unions) to negotiate worker benefits or managerial limits. In the profession, much of the structure is generated via the collective. Central 'human resource' functions such as standards for admission to the profession, licencing, censure or removal of licence to practice are normally done through committees with members deemed to represent the profession not their specific job. Updates to the information that informs knowledge and professional practice, the theory-based body of knowledge, is commonly initiated through academic processes (research, debate, journal publications, etc) which serve to endorse the new knowledge and banish what is deemed out of date or inaccurate. Evolutions to the profession's jurisdiction are often negotiated through government by an association which (in theory) is focussed on the role and the health of the profession rather than the benefits and conditions of employment of its members.

From a developmental perspective, each person must gradually acquire and expand their level of professional functioning with the medieval concept of progressing from novice through apprentice to journeyman and finally master still evident today. It is for this reason that mastering one's profession often requires 10-15 years and why professions rely on deep socialization in

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[41] For a thorough examination of explicit and implicit intent, see the work on Command and Control by Pigeau & McCann (McCann & Pigeau, 2000; Pigeau & McCann, 2002).

[42] It is interesting to note that both the medical and legal professions have been under increasing pressure to use 'plain language' rather than the obtuse phrases that have been the norm. Further, a common critique of those who have had to deal with the military is the constant use of acronyms including the habit of 'verbizing' acronyms.

[43] There are strong similarities to the role of elders amongst Aboriginal/Indigenous Peoples. Without going into the post-modern debates, it is noted that the role and value of both professional stewardship and the role of elders tended to be dismissed under 'modernity'.

addition to formal education, skills training and supervised practice. To bring forward the earlier discussion of organizations, most people understand their job and their work duties through formal, bureaucratic means: job title, position in the 'org chart', written procedures and rules etc. Those who are members of a profession tend to have a more generalized understanding of their role within the profession and the attendant professional responsibilities. With the hospital operating room or emergency ward as good illustrations, professional teams comprised of individuals in different roles rather than standard organization structures of people filling set positions allow for more flexible, adaptive and dynamic arrangements to 'get the job done'.

As an extension, one of the key issues that arises from contrasting this model of profession with the implicit model of those with a job working in an organization pertains to the difference between having a vocational versus an occupational orientation. Simplistically, a profession (from 'I profess') is intended to be a calling, vocation or way of life. With religious ministry as the classic example, a vocational orientation reflects the ideals that one is to provide the valued service to society based on a choice or internalized sense of duty with the expectations that the primary rewards received will be personal or intrinsically motivating (self-actualization, accomplishment, sense of fulfillment). Conversely, the occupation orientation reflects the concept that a job is simply a means to earn an income hence one sells ones skill in the labour market and received monetary rewards for the performance of work under specified contractual conditions, hence the rewards tend to reinforce extrinsic motivations.[44]

Of importance, mastering one's profession requires that the individual successfully internalizes the professional ethos and adopts a vocational orientation. It is the individual who must question their professional status and ultimately accept to conduct themselves in accordance to the professional values. Ideally this occurs through self-insight and self-reflection aided by professional elders who engage in professional mentoring and coaching. Importantly, those who do not acquire sufficient professional self-insight can master most of the professional requirements including learning to decipher symbolic messages however without fully considering how these influence their sense of self [45] and, more importantly, without acquiring the capacity to explain the profession to others.

This discussion of how the individual is developed and functions within a profession reveals that, as with their counterpart employed in an organization, both receive significant information upon which to make sense of their work world and to based decisions as to what to do, when and how. There are, however, very significant differences between these two conditions. For the professional, a far greater amount of this information will be developed over time by learning to decode and internalize the more subtle cues that come through socialization rather than from the objective and authoritive pronouncements from managers or statements of organizational policy. While the previous section presented the hypothesis that this professional worldview is better suited to the intellectual facets of understanding wicked social problems, it also has implications in the context of convergences. Noting that there are additional considerations to be developed starting in the next section, this discussion leads to the following speculative hypothesis:

Hypothesis: Members of professions who have engaged in effective self-reflection will have greater success communicating taken-for-granted concepts, frameworks and assumptions with those who are not part of the profession while, conversely, those who lack self-insight will impede efforts to achieve intellectual and cultural convergences.

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[44] See Cotton (1988) for application of this model to the military.
[45] See again, Lagacé-Roy & Wright (2009) for an excellent discussion of these facets and, in particular, the links to the stages of moral development and effective self-reflection.

3.7   The Public Service and the Hybrid Professional Model

The focus of this paper is to understand the dynamics that can occur when individuals or teams from different organizations have to work together under government-led comprehensive approaches to resolve wicked social problems. The section will therefore draw on aspects of this framework of professions to extend these to other groups or agencies within government which have 'ownership' or control over a specific function. In a wide range of areas across government, it is considered that there are departments or agencies which see themselves as having a clear and, generally, exclusive jurisdiction[46] and, from this jurisdiction, have develop specific expertise, responsibilities and identity as well as some value set that guides judgement in complex settings. The general reference to "Public Service Values"[47] provides one indicator of the presence of a shared value set as does the discussion of their application within government (Heintzman, 2007) and the clash of values when government services are 'contracted out' to private sector firms (Yeatman, 2001).

While it is suggested that many elements of government can or could operate based, in part, on the professional model, this is not seen as a complete fit as the dominant philosophy of government organizations is the bureaucratic ideology not the professional one. This has led some authors to suggest a model of hybrid professionalism in the public service[48] while, conversely, those examining the military have referred to the profession of arms as a bureaucratic profession.[49] For the purposes of this paper, it is suggested that it is useful to consider three approaches: the pure professional and the classic organizational models discussed earlier and a blurred professional model representing those in government caught between elements of the bureaucratic and professional ideologies. Specifically, this hybrid professional model is deemed to apply to those who have a generalized jurisdiction as a duty/ownership for a particular social good; a degree of expertise but lacking the full theory-based body of knowledge; implicit (professional) responsibilities to society which are obscured due to explicit (bureaucratic) responsibility to the government of the day; a sense of a collective identity but lacking the clarity to represent Huntington's 'corporateness'; and, a fuzzy vocational ethic which combines professional values with an occupational orientation derived from workplace practices.

To draw forward the previous discussion of organizations operating through managerial directed (formal) structural systems and leader influenced (informal) social systems, it is posited that professions rely very heavily on the informal social systems with many important cues communicated through deeply layered symbolic means while classic private sector organizations rely heavily on the formal structural systems with important information provided in objective declarative forms. The notion of hybrid professionalism in the public service would suggest that these individuals would rely much more on a balanced blend of both. To expand on the idea of 'swift professional convergence' it is suggested that, when individuals from different government organizations are brought together under comprehensive approaches, they need to quickly sort out a range of perceptions regarding 'who's who' and who will do what. It is considered that this involves integrating declarative information from the formal, structural systems with the symbolic cues from the informal, social systems with reference to two domains: broad duties (the 'who's who' part) and task-specific priorities (the 'to do what' component).

Duties can be derived from examining four areas: established role, level of competence, perceived obligations and granted authority. Priorities can be derived from examining: desired outcomes (ends), preferred conduct (means), established procedures (ways) and predetermined

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[46] More often referred to as mandate however, conceptually, similar.

[47] The current Government of Canada version is accessible at: http://www.tbs-sct.gc.ca/chro-dprh/ve-eng.asp

[48] See Noordegraaf (2007) for an excellent presentation.

[49] In particular, see Snider's (2005) update in the second edition of *The Future of the Army Profession.*

limits (consequences). Of importance, each of these facets can only be fully understood by integrating information from the formal bureaucratic/ structural factors and the informal professional/cultural factors as indicated below with (f) representing Formal Information and (i) representing Informal cues.

Duties involve:

- Role = position & title + expertise equivalency (f) + identity (i)

- Competence = certification & experience (f) + expertise/experience/interest (i)

- Obligations = Accountability frameworks (f) + responsibility & commitments (i)

- Authority = Regulations, protocols, architecture (f) + professional status / equivalency competence / expertise (i)

Priorities involve:

- Outcomes = Tasking & work plan (f) + Jurisdiction and collaborations (i)

- Conduct = Written codes & rewards systems & structural incentives (f) + (espoused) Ethos & (actual) Culture (i)

- Procedures = Guidelines/SOPs (f) + Professional Practice & Community/Collaborative conventions (i)

- Limits = Performance Measurement & Risk Analysis (f) + History & Human Capital/Wisdom(i)

To build on the previous section conclusion that members of professions who lack self-insight may actual impede rather than contribute to convergences, it is similarly suggested that those who attend to only the formal cues or only to the informal ones will fail to gain a full understanding of how the other person is, what they are trying to achieve or how they intend to do so. To draw on the social psychology literature on attribution error, the failure to incorporate all relevant cues does not mean that the individual simply lacks valuable information but that they are likely to misinterpret the actions of others based on faulty assumptions. Simplistically, lack of understanding of how the other person views their duties and priorities can easily lead to an individual falsely interpreting the other's intent, motives or goals. In addition, personal 'attachment' to the status corresponding to one's current or earned 'professional' place can become constraints in situations requiring people to do things that need to be done regardless of status. This leads to the next speculative hypothesis:

Hypothesis: Examples of 'culture conflicts' arising when individuals from different agencies work together may often be explained as due to failure by individuals to correctly integrate all relevant cues to understand the other's duties and priorities.

3.8   COMPLEX ADAPTIVE SYSTEMS

To examine meta-organizational dynamics under comprehensive approaches, this paper initially considered the relevant problem space with presentation of wicked problems and convergence then has turned to exploration of how to address these issues with an initial discussion of traditional, hierarchical organizations and then presentation of an alternate model of professions. This section will provide a second alternative: complex adaptive systems.

Drawing on range of disciplinary perspectives, complex adaptive systems (CAS) are used to describe large, multi-agent entities which operate in dynamic, adaptive and evolving contexts. CAS examples are found across the natural and social sciences including the biosphere and ecosystem; ant colonies and bee hives; the human body, brain and immune system; the Internet, political parties and the stock market. Complexity theory grew out of the conclusions from a range of scientific disciplines that the universe did not always (often) behave in a predictable manner hence the assumptions of linear cause and effect were insufficient to understand what was occurring. As such, CAS are used to understand the dynamic interactions amongst multiple entities that occur in what can be seen as chaotic conditions which are constantly morphing and evolving often producing spontaneous and unpredicted changes. While complex adaptive systems may be explained, they cannot be accurately predicted (the creation and movement of a tornado is an example). At a minimum, CAS have the following characteristics:

- Multiple entities and interdependencies
- Multi-scale processes
- Multi-temporal scale
- Sensitivity to initial conditions, hence history is non-trivial
- Non-linearity, non-reducibility and non-compressibility
- Dynamic situation
- Competing objectives
- Uncertainty and opacity
- Positive, negative and delayed feedback
- Phase transition
- Emergence
- Adaptiveness

Of the characteristics of how complex adaptive systems function, the ones deemed the most relevant for this paper are:[50]

- Emergence: the agents in the system interact and properties emerge in what appears to be a random manner rather than being planned, directed or controlled.

- Sub-optimal: complex adaptive systems do not have to produce ideal outcomes in order to survive or even thrive in their environment.[51]

- Variety: the more heterogeneous the elements or actors in the system, the better the chances of success and the greater the likelihood of new properties being created.

- Connectivity: rather than relying on control systems, CAS rely on the nature of the connections across the system(s) to form patterns, evolve characteristics and disseminate information.

- Simple Rules: complex adaptive systems are not complicated; they operate based on a few simple rules rather than the multivariate algorithms thought necessary to explain an ordered world.

- Self-organizing: agents within a CAS are constantly re-assembling or re-organizing to fit changing environmental conditions without reliance on the managerial functions of planning, organizing and controlling.

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[50] See Hass (2009) for a cogent summary of CAS with application to the business world and solving complex problems.

[51] Illustrated by Winston Churchill's quote that democracy is the worst form of government – save all others. Complex adaptive systems merely have to be better than their competitors.

To link to the earlier discussion of convergence and assemblage, a key feature of CAS is *exaptation*, which refers to shifts in the function of a trait during a process of change or evolution. For example, a trait can develop/evolve to provide one particular function, but later can become 'assembled' to serve another (feathers initially evolved for temperature regulation but provided an unanticipated 'pre-adaptation' for flight). Thus, exaptation relates to both the process and product of evolving CAS. This is similar to the concept of 'adjacent possible' where each movement within or step can change the 'solution/problem' space and create a new space of adjacent possibles – a new field of unseen, unpredictable potential, essentially revealing that many 'causes' are pluripotent (like stem cells which can become any type of other cell) and many effects can arise from multiple different causes.

The concept of exaptation is key to understanding how complex adaptive systems, under the right conditions, can produce outcomes, properties or evolutionary characteristics that are completely unpredictable yet highly useful. As has been developed throughout this paper, the 'right conditions' are the antithesis of classic, control-focused management. In this way, CAS tend to be more agile, handling non-linear interactions, decentralized control, self organizing, non-equilibrium order, co-evolution and collectivist dynamics.[52] Complex systems on the other hand, often exhibit behaviours confounding the presumption of the decision-makers who inevitably suffer from bounded rationality and thus require adoption of a mission command philosophy with broad guidance (command intent) from the top with significant latitude for initiative undertaken through responsible autonomy and the potential for assemblage.

As developed, governments, as all bureaucratic hierarchical institutions, by their nature are very likely to attempt to organize and control (manage) the emergent CAS. Conversely, examples of human/social CAS such as the free market economy and the multiple elements of civil society are constituted more like a complex system with many divergent actors (e.g. media, interest/value-based groups, industries, entrepreneurial initiators, monopolies, etc.) who also all seek to influence how the social issue is perceived, understood and addressed again with many contested arenas but no single actor in control. Thus, in contrast to the managerial control approach of government organizations, market systems and civil society involve a great many diverse networks which tend to be trust-based, self-organized and complex systems. Each can and does work across, within, and/or beyond the other, but both also need the other.[53]

To return to a comment made in the introduction, a key conclusion from this initial consideration of complex adaptive systems is that these systems do find a way to become organized however this is not achieve through standard managerial control mechanisms. Instead, the success of CAS is due to the fact that these systems are comprised of multiple, disparate actors who use numerous connections and feedback loops and are influenced by a few simple rules with the capacity to continually re-organize or re-assemble leads to the emergence of new properties, forms and solutions that, while not achieving an ideal outcome, ensure that the CAS survives despite the near chaos of its environment. Further discussions will examine the integration of organizational control functions and CAS properties however, this initial discussion of CAS leads to the next speculative hypothesis:

Hypothesis: Those seeking to enable success of integrated teams under comprehensive approaches should shift their focus from attempting to structure and control individuals' duties and functions to providing the conditions for emergent evolutions and, in particular, to reframe the managerial role as one who scans the adaptive social system to detect self-

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[52] See Atkinson & Moffat (2005) for a comprehensive discussion linking CAS properties to the Albert & Hayes work on new forms of command and control in the military.

[53] Again, see Atkinson and Moffat (2005) for excellent illustrations of this point.

organization and the establishment of the few simple rules that explain the teams' interactions.

4   INTEGRATION: THE OPEN ORGANIZATION OR CONSTRAINED CAS

4.1   INTRODUCTION

The two major components of this paper have sought to examine the problem space that requires government-led comprehensive approaches with consideration of wicked problems, convergence and management of the commons, and then to consider the approaches that may be used with a comparison of traditional organizations, professions and complex adaptive systems. As noted in the introduction, while, conceptually, one could argue that the CAS approach could be ideal to address certain wicked social problems, in practice the requirement for government to be accountable to the people for maintaining the social good means that the degree of freedom of a CAS is rarely going to be able to occur.[54] Thus, this component will explore some of the options, issues and tensions that arise from efforts to blend aspects of the organization, profession and CAS to create either a more open organization or a constrained CAS; what we will refer to as C-CAS.[55]

4.2   GOVERNMENT-LED C-CAS

It has been presented that organizations rely on both structural systems controlled through management and social systems influenced through leadership whereas a pure CAS involving people function almost exclusively through social systems with multiple, constantly interacting social exchanges influencing the system and generating the few simple rules that inform how the CAS operates. To integrate these two views as a C-CAS, it is considered that the key requirement is to provide limited guidance, direction or control and specifically to do so only with regards to specifying the boundary conditions and to facilitate the establishment of the C-CAS simple rules.[56] Limiting direction to simply setting the boundary conditions represents the earlier reference to the need for strategy without design thus specifically precludes strategy as aligning ends ways and means. In this context, strategy is seen as conceptualized by Ross Pigeau as the

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[54] One could argue that many aspects of the way in which support for the Ottawa Land Mines treaty was generated represents a C-CAS with both the Canadian government and UN providing the boundary conditions and then allowing a disparate community to create the few simple rules as to how they would tackle the issue. Nobel Laureate Jodi Williams has described how she used massively distributed collaboration to enable hundreds of individuals and organizations to create a new movement. See the International Campaign to Ban Landmines at http://www.icbl.org/intro.php for additional details.

[55] By opting to refer to a constrained CAS rather than an open organization, we are explicitly suggesting that the key question to ask is: what are the reasonable and necessary limits that must be placed on a CAS rather than the question of: what are the types of flexibilities that will be allowed within a traditional organization.

[56] The reference to establishing a few simple rules is not to imply that government will ever be free of rule sets. It is recognized however that there is almost always discretion in selecting which rules will be enforced in which way and, as demonstrated in labour actions involving 'work to rule' that no organization can function effectively if every rule is applied with the strictest of interpretations. Thus, the suggestion here is that those responsible exercise extreme flexibility and discretion in selecting and enforcing rules. Furthermore, even markets must be regulated, for instance there must be enforced standards and regulation to ensure that the price mechanism carries 'good-enough' (nothing can be perfect) information for self-organization to occur. This emphasis on self-organization is what distinguishes a governance framework from both management and leadership.

introduction of change to the status quo: as reflected by the military axiom 'no plan survives first contact with the enemy', the nature and form of this change is never known in advance. Similarly, facilitating the establishment of the rules specifically means not providing these rules but setting the conditions for which these can emerge, again, with attempting to predict or proscribe what these are to be. Consideration of how to 'shape' an appropriate C-CAS while still retaining government mandated accountabilities, requires consideration of two additional means of control beyond management and leadership, specifically command and swarm.

For some organizations, when circumstances of urgency and high risk arise, management and leadership are subsumed under the function of command.[57] Therefore, in these types of situations and contexts, command is specifically intended to affect both the structural and social systems and is exercised through both legitimate authority and social influence. As the antithesis, swarm represents a group of people who are acting and interacting based on some group-based aligned action through social (and often impersonal) networks. Recalling the earlier reference to responsible autonomy as the individual or group developing a shared sense of responsibilities, an Accountable Swarm (A-Swarm) is a manifestation of assemblage capacity enabled by convergence to produce responsible autonomy or, in other words, to create a shared sense of the purpose and responsibilities of the assembled crowd. An example of an accountable swarm could include the open-source software development movement which is a broad-reaching movement enabling anyone capable to both officially and unofficially volunteer in the production of software. This approach to software development allows anyone to obtain and modify open source code in an ongoing iterative and transparent manner. This movement has produced high quality programs (often the choice for mission critical applications) and promotes a philosophy of open and transparent collaboration. The movement has extended beyond software development to many other domains of manufacturing and design. Another very familiar example is Wikipedia – the online encyclopaedia. The fact that 'anyone' can post or edit a post in Wikipedia is often the first cause for caution about the truth or accuracy of any post. And in fact there have been many instances of vandalism and quite a number of purposefully misleading or factually wrong articles. But it is the fact that anyone can post and edit a post that vandalism is repaired and articles become better over time. The transparency that is an essential condition of both these examples generates an accountability that matches (or surpasses) that of most traditional control hierarchies. When two other conditions are also present, independent and diverse participants, then the collective action of an accountable swarm is able to produce coherent decisions explained by the wisdom of crowds. Mechanism that would work to ensure that these three conditions are respected would be integral to the development of a governance framework supporting both convergence and assemblage[58].

Importantly, the scope of command and management are 'bounded' by formal authority hence are exercised 'down and in' in support of organizational goals while leadership and A-Swarms are unbounded. Both leadership; and A-Swarm can exert influence 'up and out' as well as down and in and neither has to be necessarily aligned with organizational goals. Thus, leadership is seen as the power to influence others hence is not restricted or bounded by the formal authorities which constrain management or leadership: when one has the power to influence others, there are very few limits on the intent or direction of this influence. Professions, specifically, and

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[57] For more on this conceptualization of command, leadership and management including discussion of the 'command enablers' see the 2010 report by Okros.

[58] An important caveat related to all forms of organization is that they all experience occasions of failure. Commanders make errors of judgement, hierarchies become rigid and bureaucratized, particular markets suffer failure, regulations become outmoded. No single solution or organizational architecture can be applied at all time to all situations. Even systems that self-organization It is because of the increasingly obvious shortcoming of traditional organizational approaches to accelerating change, operational turbulence, and the related need for agility and innovation in the face of complexity that we are exploring the meta-organization as it relates to the comprehensive approach.

organizations, generally, rely on the fact that the individual has internalized an appropriate value set and achieved a sufficient level of moral development such that they will choose to use their leader power for good not evil or, more specifically, to advance organizational goals not personal ones.[59]

In the absence of effective command, but within a CAS, the social components will dominate with a potential for operating either as a chaotic mass, a mob, or as a swarm, depending on the communicative capabilities in the situation and of the participants. By definition, the social component implies a communicative environment and the competence can be measured by the 'quality' of its agility in self-organization. Key to effective self-organization is a capability for transparent aggregation of situational information (TASI).[60] By extension, the presence of both command (as Intent) and a competent communicative environment (TASI), the potentially emergent swarm is self-organized toward accountability to 'command intent' – an accountable swarm or C-CAS.

Conceptually, command is the authority to formally initiate action; management is the authority to formally amend action; and leadership is the personal and a-swarm is the group capacities to influence action. Command involves the principle-based initiation of action through control networks and can be explained by the Pigeau-McCann CAR Model. Management involves the rules-based amendment and control of action through bureaucratic networks and can be explained by rational actor (including bounded rationality) models. Leadership involves values-based sense making through personalized networks and can be explained as unbounded power.   A-Swarm involves group-based consensus making through social networks and can be explained by the wisdom of crowds as well as by what Adam Smith referred to as the invisible hand of 'moral sentiments'.[61]

In this context, command represents a very high concentration of power, authority and responsibility in one individual.[62] While the traditional image of the military commander is the all-knowing, all-powerful individual surrounded by subordinates waiting to be issued orders, the reality is that no single individual could possibly exercise this degree of micro-management[63], the reality is that the concept of mission-oriented command is closer to how a C-CAS might operate than how a classic organization is controlled. The key to this philosophy is that the commander provides only the direction necessary to orient the subordinate group(s) towards an overarching

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[59] The factors considered to 'shape' leader motives are a combination of degree of personal vs position power and the use of one of three referents: interests, rules or principles. Each of the referents can have a positive or negative focus: organization vs self-interest, holistic vs rigid application of rules and relativist vs idealistic use of principles. See Okros 2010 report for a more detailed presentation of this concept.

[60] Examples of TASI include: In a market system it would be the 'price mechanism'; in an ant colony it would be the 'pheromone cloud', in a swarm of wasps building a hive, it would be the hive-as-being-built itself. Perhaps, in the human domain the addition of trusted should be added. Thus Trusted Transparent Aggregate of Situational Information TTASI, which underlies the concept of trusted situational awareness.

[61] Adam Smith made his first reference to the 'invisible hand' in his first book "The Theory of Moral Sentiments" where makes the case that people judge their behaviour in relations to being 'praiseworthy' and/or 'blameless'. A careful reading of both of Smith's books makes evident that Smith understood a market system as a moral system and that a more appropriate term for self-interest would be 'moral self-interest' (rather that bounded self-interest which suggest simply a calculus of enlightened selfishness).

[62] See again the work by Pigeau and McCann and, in particular, the CAR model (Competence, Authority & Responsibility) with explanation of the different types of command an individual may exercise.

[63] Not that some don't try.

goal to be achieved with sufficient guidance on what is and is not permissible.[64] This approach is derived from two key considerations. The first is that the senior commander is unlikely to have a sufficient understanding of what is occurring in a very dynamic environment hence those who do have a sense of sudden and often unexpected events are given the guidance and authority to respond to these quickly. The second is that this allows the senior commander to focus on a narrow range of issues hence does not become completely overloaded with making sense of a complex situation that can range from the on the ground tactical to the highest level of (political) grand strategy.

Both the understanding and practice of command (in military parlance: command and control or C2) continues to evolve. As referenced on several occasions, the Pigeau & McCann work reframed C^2 with a behavioural science approach that emphasized the human in command and highlighted the importance of creativity, human will and implicit intent. Alberts & Hayes started from the premise of increased information connectivity to present options for what is seen as the maximally distributed mission command approach which they refer to as power to the edge. Both, however, are still premised on two key assumptions which should not be imposed on C-CAS: the presence of a commander (albeit far less omnipotent than the traditional model) and the reliance on a shared set of assumptions or common culture.

Regardless of which model is applied, given the demands of command, the individual exercising command is aided by supporting mechanisms (social and structural) with:[65]

- Command enablers designed to restrict command effort to only what is essential

- Leadership enablers designed to amplify the effects of leader influence

- Cultural enablers designed to limit formal command intent to only what is essential[66]

- Management enablers designed to optimize managerial-control effort

Of importance for this paper, the cultural enablers are intended to create very high degrees of shared understanding based on the professional model and include:

- significant position power including high status/social distance

- strong system of professional socialization

- a shared moral code with accompanying rationalization for actions

- clearly defined and broadly understood role requirements

- a broadly shared 'tight' culture that emphasizes obedience to authority

- shared experiences, stories, myths and beliefs

- reinforcing symbols, traditions and oral history

As already alluded to on several occasion, a significant challenge of applying even the loosest form of mission-oriented command, is that it is premised on the existence of these cultural enablers, however, these will not exist when a C-CAS is created. Further, when and as the CAS culture arises, the culture including the decisions as to which rule sets will apply, which norms will be adopted and which worldview(s) will frame sense making, will necessarily be created by the members of the CAS not those attempting to regulate it. Subsequent sections will expand on

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[64] Thus, the Army reference to 'left and right of arc' which defines the domain in which the subordinate commander is assume to have significant discretion to decide exactly what needs to be done how. Note the parallel to the concept of professions and jurisdictions.

[65] See again the draft report by Okros for further discussion of command enablers.

[66] Again, see the work by Pigeau & McCann on explicit vs implicit intent.

the issues of how a C-CAS might function however the inter-relationships between command and shared culture lead to the speculative hypothesis that:

Hypothesis: Those with senior responsibilities for the success of a government-led comprehensive initiative (hence for creating an effective C-CAS) should simply monitor and not attempt to guide or direct the emergence of an effective C-CAS culture.

4.3   HOLONIC ENTERPRISES

While the previous discussion of command presented this function being exercised primarily by one individual (the Commander) or, at a minimum, at one level, the reality is that governments and C-CAS, in particular, will be subject to multiple layers of decision making across multiple organizations. The integration of multi-layered, multi-organizational contexts with CAS properties has been presented as holonic enterprises (Ulieru, 2003). A framework of four levels with multiple vertical and horizontal interactions provides a valuable method to examine C-CAS. In the military view these are: grand strategy, strategic, operational and tactical; in the public service framework they are: political direction, policy setting, program development and implementation.   This paper will omit the highest level for several reasons including that fact that it is at this level that the requirement for, and endorsement of, comprehensive approaches occurs.

The main point in applying a holonic enterprise approach is to identify the key issues that are addressed at each level. Thus, potential meta-organizational issues can be developed using a diagnostic framework that examines the three broad levels of strategic/ policy; operational/ program and tactical/ implementation. Each level has corresponding subsets of issues which in turn can be better understood through three key questions: is the issue understood (defined, known vs ambiguous, unknown); is there agreement as to how it is understood by all parties; and, do the decisions at a higher level, impede the opportunities for the types of convergence and assemblage needed to allow a C-CAS to emerge.

The subset issues for each broad level include:

- Policy issues which must address:
    - nature of the general problem
    - overall objectives to be achieved
    - broad principles to be applied
    - the type of organizational architecture best suited
    - relative effort/resources to be assigned
    - consequences to avoid
    - opportunities to be pursued

- Program issues must address
    - parameters for planning, self-organization, and safe-fail entrepreneurialism
    - outcomes to be achieved
    - rule set(s) to be applied and when they should be applied
    - allocation of responsibilities and resources
    - delegation of authorities

- Delivery of capability
    - parameters for adaptation and self-organization
    - tasks to be completed
    - outputs to be generated
    - SOPs to be followed and when they should be followed

- o shared command/program intent
- o decision making/communication mechanisms to be used

An interesting illustration of the application of multi-layered, multi-departmental decision making is provided in the research on comprehensive approaches conducted by the Australian government (Australian Public Service Commission, 2004). According to their "Good Practices Guide", the characteristics of the task of establishing convergence and assemblage capability includes: policy development, program design, service delivery, crisis management and cross-jurisdictional enabling protocols. This will involve many types of structures including: interdepartmental committees, task forces, joint teams, inter-agency agreements and the possibility of frontier agencies. For crisis management, they believe a 'hub and spokes' approach to coordination works best with one lead agency and the use of interdepartmental committees, however, it may be worth examining the potential emerging through network and social media technologies. Key is the need to balance complexity with the imperative to act. Noting that the condition requiring a C-CAS is the fourth below, they offer four scenarios:

- Low Imperative to Act + low complexity = solutions can be agreed on but it is hard to generate action as stakeholders can diverge regarding assigning priority to action resulting in either frustration or effort to elevate the situation to crisis level to stimulate action. (This is consistent with well entrenched 'change management' approaches)

- High imperative + low complexity = solutions can be agree on and results achievable, but the situation remains vulnerable to hidden agendas by stakeholders willing to leverage urgency to achieve secondary objectives

- Low imperative + high complexity = agreement unlikely, opposing positions well known, hard to get traction, here again some stakeholder may tend to elevate it to a crisis to stimulate action.

- High imperative + high complexity = agreement unlikely and opposing positions well known but real urgency can make the difference enabling compromises to be made

As has been developed from the initial discussion of addressing wicked social problems, whether viewed as an holonic enterprise or the parameters of the Australian 'connected' government, the key issue throughout is not on the types of decisions made but the intellectual framework/ worldview(s) used to do so. Although the layering of decision making from policy to program to implementation reflects the common levels of hierarchy in most organizations, it is posited that the deeper reason (often neither understood nor applied) is that each set of issues requires a difference method of inquiry. This can be summarized with reference to academic disciplines. The strategic/ policy domain should be based on the methodologies of the Arts (particularly philosophy and the social sciences) with a focus on asking the right questions with an understanding that the most common response will be other questions. The operational/ program level should be based on the methodologies of the Natural Sciences including economics and system sciences with a focus on answering these questions the right way including using the strategic questions of questions to ascertain whether one has understood the question and the answer. The tactical/implementation arena should be based on the methodologies of the Computational and Complexity Sciences including Engineering to apply the answers/ understandings the right way. Thus, the key issue presented in applying holonic approaches to understanding multi-layered decision making is to recognize the role of shifting academic frames of reference or methods of inquiry with, in particular, the strategic/policy level to be dominated by the types of thinking that is needed to grasp the implications of seeking to address wicked social problems. The implications for the individuals who will comprise a C-CAS due to the nature of the control exerted and the types of questions and answers provided will be explored in the following section however this discussion of holonic enterprises and multi-layered decision making leads to the speculative hypothesis that:

Hypothesis: The most critical initiating condition leading to the creation of an effective C-CAS will be based on the intellectual framework adopted and, in particular, the use of the Arts approach of seeking to ask the right questions rather than the Science approach of trying to answer what appear to be obvious questions the right way.

5   THE HUMAN ELEMENT: THE PERSON IN THE C-CAS

5.1   INTRODUCTION

Although this paper has adopted a social science perspective throughout, thus has been focused on people rather than mechanisms, this final section will turn more specifically to the perspectives on the individual who is part of a meta-organizational team under a comprehensive approach. The initial discussion will consider the perspective of the person as a decision maker and will then shift to consideration of interpersonal dynamics and sources of error, conflict and tensions.

5.2   PEOPLE AS DECISIONS MAKERS WITHIN C-CAS

In the context of convergence/assemblage amongst government organizations oriented to social messes, people remain decision makers shaped by bounded rationality. In one sense a person-as-actor refers to: an entity that is capable of action; and who acts for, or in the place of another (the principal), by authority of the principal. On the other hand, an "actor" can refer to both individuals and groups (such as administrative authorities or consumer organizations). Actor analyses can be applied to wicked social problems based on the understanding that all parties have their own interests, goals and strategies. Further, these analyses can also provide a structured inventory of the parties and their interests to get an overview of how these can work to change an existing institution or situation by their priorities or value systems.

Decisions by actors in the context of C-CAS convergence/assemblage can be explained through a combination of:

- Deductive reasoning drawing primarily on formal, structural elements and involving application of available resources to manage predicted risks

- Inductive reasoning drawing on informal, cultural elements, metaphors, heuristics, narratives, prototypes, etc. and drawing on shared beliefs or paradigms to make inferential leaps

- Affective determinations and responses influenced by social dynamics and using normative, conventional, transgressive (taboo-breaking or pioneering), radicalized or anti-social processes to determine appropriate responses

- Pre-determined mental models and related implicit assumptions based on history and socialization, involving path-dependent application of taken-for-granted 'common-sense' assumptions to identify problems and possible solutions.

As has been developed, all four decision making approaches can be strongly influenced by: the broad professional ideology and processes of deep-rooted socialization and institutional frameworks that frame how the individual sees themselves and their world; the shared culture of the group(s) within which the individual is embedded; and, the dynamics of group climate in response to day to day activities.

In seeking to understand both the C-CAS context and others who are (or could be) part of the C-CAS, it is posited that the actor will act based on a combination of:

- The overarching goal

- The organization's subset of responsibilities and interests in achieving the overarching goal

- Other organizational objectives

- Personal and career objectives

- Professional experience and perspectives

- The views, norms and dynamics that emerge in the new temporary assemblage/work group

- Perspective of the impact of the social mess and the shared societal expectations of what the problem is and how it is to be resolved

Thus, given the complexity of convergence and assemblage to address wicked social messes, actors can find themselves facing: role ambiguity/overload, organizational cultural confusion and multiple conflicted rule sets (catch 22s). Decisions will be based, in part, on subjective pay off matrices with, related magnitudes of consequence. For example, fear of failure tends to be weighted much more heavily than expectations of successes; own success tends to be weighted more heavily than shared successes; and failures tend to be uniquely assigned to individuals while successes are shared by all. As a result there tends to be greater effort to engage both face saving and responsibility mitigation which also explain why it is easier to get forgiveness than permission as permissions shifts onus of responsibility from requester to granter. These factors lead to the speculative hypothesis that:

Hypothesis: Evaluations of individual decision making need to go beyond the view of the person as a rational decision maker by adopting elements of actor analyses and, in particular, recognizing how deeply embedded elements of socialization as well as the temporal dynamics of team climate can influence decisions.

5.3   INTERPERSONAL DYNAMICS IN C-CAS CONTEXTS

As an extension to the previous comments, actors will represent both their organization (principal) and themselves, acting and thinking beyond just their assigned role. As a representative of an organization, actors will often assume greater authority and responsibility than is specifically attributed to their specific role.[67] Of importance when initially developing the C-CAS and, in the absence of the common dynamics for developing interpersonal relationships (specifically well established levels of position and personal power), external actors (e.g. colleagues) will seek indicators of swift trust and legitimacy. Swift trust[68] can develop under the conditions of:

- aligned activity (common goal & interdependence),

- constrained environment (time pressure & sufficient but not excessive resources),

- collegial atmosphere (professional respect & focus on job to be done) and

- a trust broker to mediate frictions.

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[67] An interesting military illustration comes from the US Marines. Unlike virtually all others, Marines in dress uniform to not wear a name tag signifying, in part, that they representing the entire Corps not just themselves.

[68] For discussion of swift trust, see http://changingminds.org/explanations/trust/swift_trust.htm. For application in the context of meta-organizational responses to disasters, see Tatham & Kovacs (2010), for application in the military context, see Ben-Shalom et al (2005).

With the issue of swift trust, arises the question regarding a similar possibility of "swift acculturation" or a process whereby individuals and groups are able to rapidly make sense of the cultural nuances of the context and each other. Again, it was noted in the earlier discussion of professions that these institutions use various symbolic means to communicate important cues as to the professional status of the individual. Elsewhere, Okros has suggested a third type of leader power: with position power seen as provided by the organization but not transferable, personal power as earned by the individual hence portable; and, professional power as provided by the organization yet still transferable thus allow for the establishment of 'swift professional status'.[69]

The key implication here is that it is important to consider the formation of a C-CAS through the eyes of its members not those charged with 'leading' or 'managing' it. Further, in considering the interpersonal dynamics at play, it is important to consider the condition and cues that allow each to gain a rapid understanding of how the others are, what they are likely to do and why they are likely to behave in certain ways. This leads to the speculative hypothesis that:

Hypothesis: The literature and models on swift trust could be extended to develop more inclusive understanding of how individuals initially interact and start to form a C-CAS particularly be examining the possibilities of 'swift acculturation' and 'swift professional status'.

5.4 SOURCES OF INTER-ORGANIZATIONAL CONFLICTS AND TENSIONS

In addition to considering how individual's can establish an understanding of each other and how they will operate in a C-CAS, it is equally important to examine the sources of conflicts and tensions especially as these tend to be the most common excuses for comprehensive initiatives to not produce the results government leaders expected. There are a number of 'simple' explanations of the issues that can arise when any organization identifies work to be done or the goals to be achieved, for example:

- Standard mistakes of management (or military OPP) such as – errors in problem analysis, selection of incorrect courses of action, misallocation of resources, application of the wrong rule set(s), and the ubiquity of open-loop planning where management create objectives, plan, and implement without mechanisms of corrective feedback;
  - All of which are magnified when multiple organizations have to work towards a shared goal and can become fundamental errors when attempting to address wicked social problems
- Common frictions of interpersonal dynamics such as – (perceived) competing personal agendas, 'personality' conflicts, previous histories, (perceived) incompetence, lack of trust or confidence in others
  - More complicated are the deeper conflicts of value such as worldviews, attributions errors (especially when assuming shared understanding), and competing professional values or orientations.

Key sources of likely contradictory worldviews are between:

- Those who are focussed on maintaining order (police and military who tend to operate with a pessimistic Hobbesian perspective),
- Those focussed on individual well being (the health and social services who tend to operate with a more optimistic – perceived as "Pollyanna" perspective) and

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[69] See again the forthcoming Okros report.

- Those focussed on political implications (senior bureaucrats and Ministers who tend to operate with a reactive Machiavellian perspective)

The Quinn's competing values model referred to earlier has been applied to create the Canadian Forces Leadership Institutional Effectiveness model. This model suggests that individuals may operate with different frames for prioritization (values) of the four outcome values: mission accomplishment, member well-being, internal integration or external adaptability; as well as regarding the appropriate conduct values which underpin moral or ethical reasoning (e.g. as articulated in Military Ethos or other that of professions). An obvious source of conflicts or misunderstandings is when individuals place different emphases on the importance of any one of these outcomes and/or worse, assume that others have the same relative value priorities as they do.

Other complex sources of tensions can arise from errors of command, contested jurisdictions and culture clashes. Errors of command (vice management) can occur due to one of three types of failures: failure to anticipate, to adapt or to learn (failure in any two can leads to significant mission failure, failure in all three lead to catastrophic failure such as Pearl Harbour).[70]

As already articulated, contested jurisdictions arise when one organization perceives that they have (or should have) exclusive control over a domain of activity. This is amplified when the jurisdiction concerns 'institutional' boundaries. The concepts of contested jurisdictions and the clash of loose versus tight cultures are considered to have significant potential to explain many of the interpersonal conflicts that arise as actors function in multi-organizational settings and are further exacerbated in the context of addressing wicked social problems. A compounding problem concerns the need to deal with multiple events with multiple time horizons. Actors are often are still recovering from the previous issues while they are engaged in the current issues and simultaneously preparing for multiple plausible futures. Convergence and assemblage are prone to inheriting the challenges due to lack of awareness of each actor's past and anticipated futures. This perspective leads to the speculative hypothesis that:

Hypothesis: Analyses of why effective or ineffective interpersonal relations in C-CAS can arise, it is important to move beyond simple explanations to look for conflicting worldviews, priority given to differing outcome or conduct values; or the failures to anticipate, learn or adapt.

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[70] Based on the Cohen & Gooch (2005) framework for analyzing military failures.

6   CONCLUSION

6.1   INTRODUCTION

This paper has explored the research and conceptual landscape that contextualizes the concept of a meta-organization capable of enacting a comprehensive approach. As the primary intent has been to generate research questions rather than to answer them, this multi-disciplinary analysis has integrated a number of disparate concepts and ideas to present a series of speculative hypotheses that may be used to inform future research agendas. To do so, we examined multi-organizational issues from a social and human perspective with consideration of the problem space that requires comprehensive approaches; assessment of how agencies can be organized to deal with these issues; and, presentation of the implications for moving from traditional managerial structures to alternate organizational approaches.

The key suggestion presented is the assessment that government-led comprehensive approaches likely require setting the conditions to enable the emergence of a constrained complex adaptive system as the appropriate framework to enable meta-organizational effectiveness. As a corollary, the observations laid out suggest that the comprehensive approach itself represents an implicit institutional innovation. The concepts of convergence and assemblage developed throughout the paper more explicitly extend this form of institutional innovation. In resolving wicked social messes, the meta-organization, comprehensive approaches, convergence and assemblage all suggest a new environment where meaning emerges and evolves collectively and collaboratively representing a qualitative difference in the way people make sense of their cultural and operational experience.

The arguments and evidence presented indicate that optimizing outcomes under comprehensive approaches (with the corresponding meta-organizational issues) inevitably requires institutional innovation. In particular, enabling the convergence framework and assemblage capability that would shift the organizational ecologies of government and related institutions toward being an effective C-CAS involves recognizing that dealing with wicked problems and other forms of complexity is an art requiring at minimum:

- Holistic thinking (superseding more traditional linear, reductionist and partial approaches), with an emphasis on the creative development of a full range of appropriate and adequate questions and frames and the articulation of the deeper elements related to participant world views, implicit assumptions and epistemologies.

- Openness and capacity for innovation, flexibility and empowered adaptation and social leadership, as well as a capacity for greater comfort with loose cultures, uncertainty and a professional ethos, in order to refrain from undue dependence managerial techniques.

- Capacity to work and act across organizational boundaries and jurisdictions, including mechanism for transparent accountability (to mitigate differing agendas) as well as for the resolution conflicts, and conflicts of interest.

- A more nuanced and contextually responsive understanding and application of governmental accountability frameworks, with a greater emphasis on developing simple rules enabling emergent outcomes and on the creation of knowledge and its application

- The development of a capacity for trusted comprehensive awareness (transparent aggregation of situational information) that would enable the self-organized responsible autonomy of a C-CAS as well as a monitoring approach to mitigate temptations to depend on managerial and directive control.

- Better linkage of policy makers with science with an emphasis on an understanding of behavioural and cultural change and related issues

- Increased comfort with uncertainty, improvisation, emergent evolving self-organization and incentive structures support long-term focus

- An integrated capacity for ongoing engagement of citizens and stakeholders (solutions must be something done with – rather than to)

- Ongoing exploration and development of requisite new skills with an emphasis on individual, social and teams competencies as well as new media literacies including those supporting 'swift trust, acculturation and professional status'; working with social networks, pooling knowledge within and harnessing a collective intelligence; and negotiating across cultural differences.

- Ongoing exploration into the determinants of effective and ineffective C-CAS.

6.2   FUTURE RESEARCH

It is fully recognized that the ideas presented in this paper require further exploration and empirical analyses. To assist in framing potential future research agenda, five potential domains have been identified and will be discussed below. The five domains are:

- Theory Building (TB): hypotheses that may serve to expand current conceptual frameworks and/or present alternate perspectives to existing theory.

- Modelling and Simulation (M&S): hypotheses that may contribute to parallel initiatives to understand the dynamics of meta-organizational decision making.

- Organizational Analyses (OA): hypotheses that could be used to examine structural systems (policies, procedures, doctrine or SOPs) and social systems (norms, beliefs, expectations, assumptions or small group dynamics).

- Lessons Learned (LL): hypotheses that may inform analyses of specific cases where comprehensive approaches were applied.

- Professional Development (PD): hypotheses that may lead to changes in how individuals and small teams are developed to perform effectively under comprehensive approaches.

As a first step in considering future research, the key hypotheses presented in this paper are repeated below with the relevant domains listed for each[71]:

- When seeking to address wicked social problems, failure to adopt an appropriate approach to framing questions will result in inaccurate or inadequate problem definition resulting in ineffective strategies to attempt to resolve the underlying problem(s): **LL**, PD.

- Failure to recognize the 'deeper' elements of convergence pertaining to worldviews, taken-for-granted assumptions, new modes of knowledge production and epistemologies will result in over-attention to the lower order functions of facilitating cooperation, providing coordination and exercising managerial control as well as lack of attention in establishing the conditions for the creativity needed to address wicked social issues: **PD**, TB, OA, LL.

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[71] The most relevant domain is listed first and identified in bold.

- Even when the benefits of coming together in convergences are clear, the logic leading to the 'tragedy of the commons' suggests that there will be powerful, personal reasons why individuals will engage in actions that will enhance their own objectives at the detriment of the collective: **LL**, TB, M&S.

- When it is observed that a comprehensive initiative did not achieve the results intended, the post-event analyses are likely to show that there was a heavy reliance on managerial techniques to provide planning and direction via structural systems and inattention to the exercise of effective leadership to influence key social systems: **LL**, OA, PD.

- In order to work effectively with others under comprehensive approaches, those organizations that have tight cultures will have to adopt elements of loose cultures including flexible norms; accepting ambiguity and uncertainty; and, living with fuzzy roles and values: **TB**, OA.

- In order to facilitate the flow of knowledge and ideas necessary to address wicked social problems, organizations will need to shift their decision making framework and enabling architecture to adopt more open systems and focus on creating knowledge rather than reducing transaction costs: **M&S**, OA.

- Those who approach wicked social issues using a professional framework will have greater success in understanding the complexities and implications than those who apply only a standard managerial decision making model: **PD**.

- Members of professions who have engaged in effective self-reflection will have greater success communicating taken-for-granted concepts, frameworks and assumptions with those who are not part of the profession while, conversely, those who lack self-insight will impede efforts to achieve intellectual and cultural convergences: **PD,** TB.

- Examples of 'culture conflicts' arising when individuals from different agencies work together may often be explained as due to failure by individuals to correctly integrate all relevant cues to understand the other's duties and priorities: **LL**, PD.

- Those seeking to enable success of integrated teams under comprehensive approaches should shift their focus from attempting to structure and control individuals' duties and functions to providing the conditions for emergent evolutions and, in particular, to reframe the managerial role as one who scans the adaptive social system to detect self-organization and the establishment of the few simple rules that explain the teams' interactions: **PD**, TB, M&S.

- Those with senior responsibilities for the success of a government-led comprehensive initiative (hence for creating an effective C-CAS) should simply monitor and not attempt to guide or direct the emergence of an effective C-CAS culture: **OA**, TB.

- The most critical initiating condition leading to the creation of an effective C-CAS will be based on the intellectual framework adopted and, in particular, the use of the Arts approach of seeking to ask the right questions rather than the Science approach of trying to answer what appear to be obvious questions the right way: **TB,** PD.

- Evaluations of individual decision making need to go beyond the view of the person as a rational decision maker by adopting elements of actor analyses and, in particular, recognizing how deeply embedded elements of socialization as well as the temporal dynamics of team climate can influence decisions: **M&S**, TB.

- The literature and models on swift trust could be extended to develop more inclusive understanding of how individuals initially interact and start to form a C-CAS particularly be examining the possibilities of 'swift acculturation' and 'swift professional status': **TB**.

- Analyses of why effective or ineffective interpersonal relations in C-CAS can arise, it is important to move beyond simple explanations to look for conflicting worldviews, priority given to differing outcome or conduct values; or the failures to anticipate, learn or adapt: **LL,** TB.

In the domain of theory building, the generalized implication of this paper is to suggest that researchers engage in more integrative, cross-disciplinary approaches rather than staying within the confines of the dominant organizational behaviour or industrial/organizational psychology literatures. At an institutional level, it is considered important to critique the taken-for-granted assumptions about how work is organized and, in particular, the alternatives to using a hierarchical, power-based approach to ensuring that teams accomplish the right tasks the right way. While the idea of allowing unrestricted Complex Adaptive Systems to operate is likely too close to anarchy for governments, theoretical research could valuably assess *why* controls are put in place rather than assuming control is necessary and focusing on *what* controls to put in place.

At the small group/team level, it is considered valuable to incorporate more anthropological or sociological approaches to understand how 'organizational culture' or, more accurately, how individuals and groups construct a shared community with accompanying worldviews, belief systems and norms. The key, of course, is to seek to understand the meta-organizational context as experienced by the individual and group rather than as desired by those notional in charge of the enterprise. Additionally, the concepts of assemblage and the notions of swift acculturation and swift professional status may be worth exploring.

At the individual level, it is recommended that attention be given to enhancing understanding of how individuals make sense of unstructured, complex, dynamic social environments particularly as informed by models of complex adaptive systems. The growing literatures on how individuals approach social networking and draw on the information embedded in the internet to engage in independent sense making and knowledge generation may contribute significantly to understanding the individual within the team within a multi-organizational comprehensive approach. As an extension, analyses of the current youth cohort and the impacts of what is being referred to as the next generation 'sentient' internet would be worth examining.

In the domain of modelling and simulation, the generalized implication of this work is to suggest that it is critical to understand the complexity of the organizational, small group and individual dynamics that are likely to come in play when comprehensive approaches are used to resolve wicked social messes. In particular, it is recommend that, rather than assuming alignment and coordination from the most senior/strategic/policy level down to the coal face/tactical/delivery level, attention should be given to the potential disconnects, contradictions and tensions that are likely to arise.

In the domain of organizational analyses, the generalized implication of this work is to highlight the importance of the social systems and downplay the role of the structural systems. The more specific corollary is to indicate the importance of attending to effective leadership to influence the social systems rather than efficient management to operate the structural components. As an extension, when conducting assessments of how an organization should establish the conditions for effective comprehensive approaches, the focus should be on determining the ways in which policies, procedures and the assumptions of the most senior cadre might impinge on allowing the flexibility, creativity and dynamic evolutions under the conditions of convergence rather than attempting to examine whether the outputs of standards managerial decision making such as providing direction, allocating resources, monitoring feedback etc are appropriate to ensure (read impose) success. This suggests a significant shift in the dominant government approach of prudence and planning to one of delegation and risk taking.

In the domain of lessons learned analyses, the primary implication of this paper is to suggest that these analyses should start by examining what emerged under a comprehensive approach and, only after having done so, compare the results observed with what had been intended by senior policy makers. It is suggested that this approach will likely reveal significant disconnects between the assumptions and intentions of those at the top as compared to the reality that emerged on the ground. As an extension, the key question to be asked is not why did the meta-organizational team not function as intended by seniors but why did the seniors assume it would.

In the domain of professional development or, more accurately, the development of professionals, research could gainfully examine how to facilitate 'slow growth' attributes of identity, sense making, independent reasoning and professional wisdom. For those who will lead teams under comprehensive approaches, develop should focus on assisting self-insight, enhancing boundary spanning skills and imparting the intellectual frameworks needed to grasp wicked social problems and understand conceptual convergences. For more senior leaders, development could focus on enabling creativity and learning to 'read' emerging group dynamics and unique cultures rather than attempting to impose predetermined solutions on others. Further, consideration should be given to assisting members of one profession to explain themselves and their profession's world view to others in terms that non-members can understand.

In sum, this discussion has provided a broad set of recommendations for future research which, as a whole, strongly encourage researchers to more critically examine the models, frameworks and literatures that they are drawing on and to engage in more cross-disciplinary work to challenge and critique discipline-specific taken-for-granted assumptions. While the emphasis for future research should be in the theory building domain as well as modelling and simulation to test the various speculative hypotheses presented, some limited suggestions have been presented in the more applied domains of organizational analysis, lessons learned and professional development.

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List of symbols/abbreviations/acronyms/initialisms

A-Swarm	Accountable Swarm
CAR	Competence, Authority and Responsibility
CAS	Complex Adaptive Systems
C-CAS	Constrained Complex Adaptive Systems
C^2	Command and Control
CEO	Chief Executive Officer
CF	Canadian Forces
CV	Curriculum Vitae
DND	Department of National Defence
DRDC	Defence Research & Development Canada
G20	Group of Twenty (Industrialized Nations)
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
H1NI	Influenza A virus subtype H1N1
LL	Lessons Learned
M&S	Modeling and Simulation
OA	Organizational Analyses
OPP	Operational Planning Process
PD	Professional Development
SARS	Severe Acute Respiratory Syndrome
SOPs	Standard Operating Procedures
TB	Theory Building
TASI	Transparent Aggregation of Situational Information
TASK	Transparent Aggregation of Situational Knowledge
TTASI	Trusted Transparent Aggregate of Situational Information
TIF	Technology Investment Fund
UN	United Nations

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Abstract

Governments are increasingly requiring different agencies to work together in demanding circumstances using a whole of government or comprehensive approach. This paper applies a social and human perspective to examine how a meta-organization may be capable of enacting a comprehensive approach. The multi-disciplinary analyses integrate a number of disparate concepts to present speculative hypotheses that may be used to inform future research agendas. The initial section examines the problem space that requires comprehensive approaches with discussion of wicked problems, convergence and assemblage, and the management of the commons. The second major component assesses how agencies can be organized to deal with these issues with comparison of the hierarchical bureaucratic approach to that of professions and complex adaptive systems. The two subsequent sections present the implications for moving from traditional managerial structures to alternate organizational approaches with specific consideration of the human element. The key suggestion presented is that government-led comprehensive approaches likely require setting the conditions to enable the emergence of a constrained complex adaptive system as the appropriate framework to enable meta-organizational effectiveness. Implications for future research are provided in the domains of theory building, modelling and simulation, organizational analyses, lessons learned and professional development.

De plus en plus, les gouvernements demandent à différentes organisations de travailler ensemble dans des circonstances difficiles en adoptant une approche globale. Dans le présent document, nous examinons d'un point de vue social et humain la façon dont une méta-organisation peut s'y prendre pour mettre en œuvre une approche globale. Nous analysons divers concepts distincts dans le but de formuler des hypothèses susceptibles d'éclairer les futurs programmes de recherche. Dans la première section, nous nous penchons sur l'étendue des problèmes nécessitant une approche globale en nous intéressant plus particulièrement aux problèmes pernicieux, à la convergence et à l'association, et à la gestion des ressources communes. En deuxième lieu, nous voyons comment on peut préparer une organisation à composer avec ces difficultés en comparant la méthode hiérarchique à celle utilisée en milieu professionnel et dans les systèmes adaptatifs complexes. Dans les deux sections subséquentes, nous montrons ce qu'implique le fait de délaisser une structure de gestion classique pour adopter une méthode organisationnelle différente, en tenant particulièrement compte de l'aspect humain. Enfin, nous en venons à la conclusion que l'adoption d'une approche globale dirigée par le gouvernement exige vraisemblablement d'établir des conditions précises qui formeront le cadre nécessaire, c'est-à-dire un système adaptatif complexe et restreint, pour garantir l'efficacité de la méta-organisation. Cette étude fournit également des pistes en vue de recherches ultérieures dans les domaines de l'élaboration de théories, des technologies de modélisation et de simulation, des analyses organisationnelles, des leçons retenues et du perfectionnement professionnel.

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Organizations; decision making; whole of government; comprehensive approach; wicked problems; convergence; complex adaptive systems; organizational culture; leadership; public administration; professions