



This concept information note is the second in a series of five being made available unedited to support DCDC's **command and control in the future** project. The information notes are designed to introduce the thinking and themes of the joint concept note that will publish in late 2024.

Concept
information
note 2

February 2024

Introduction

Global Strategic Trends 7 (UK MOD, 2024) describes the multiple concurrent challenges, threats and opportunities that military organisations are anticipated to face within the complexity of Future Operating Environments. Houghton (2024) built from this work, discussing some of the environmental trends and geopolitical shifts that indicate we are transitioning into an increasingly complex world of Great Power Competition alongside multiple concurrent state and non-state threats and competitions. The complexity of these interactions arises mostly because of changes in human behaviours, and because of changes in the scale and character of interactions between people. Together this highlights the need to develop a much deeper conceptual understanding of Defence activities and organisational behaviours. Houghton (2024) states that there is no single or primary trend that drives change or complexity; rather, it is the confluence of multiple factors and their frequently unpredictable interactions that are of greatest concern to UK Defence, fuelled by a spectrum of concurrent actors using disruptive means and novel technologies across hyper-connected global competitive domains.

This paper explores some of the Defence organisational limitations in coping with complex problems, and what type of organisational changes could help Defence start to achieve advantage within the inherent complexity of conflict - a source of significant challenge. The use and intended meanings of some terms used in this paper are described below:

- **Emergence.** Emergence is a key concept in complexity science, where new properties and behaviours emerge out of the interaction between the parts of a complex system. In this context, the paper refers to the idea that new Defence organisational properties can and will emerge over various scales and time periods. Defence can either seek to shape and exploit such emergence as a way to cope better with variety or can attempt to suppress it.
- **Organising (vs Organisation).** The concept of emergence helps to explain the distinction between organising and organisation. 'Organisation' is considered to refer to a relatively stable and pre-designed set of structures and processes. However, a different way of perceiving this is as the more dynamic act of 'organising' - where, how and when we might organise assets and capabilities in response to a changing environment.
- **Enterprise.** The word 'Enterprise' is used to separate thinking from contemporary Defence understandings of fixed, physical organisations, and to convey the likelihood of multiple entities from more than one organisation, working together

in future activities, to resolve the complex problems embedded in crisis, conflict and competitive situations. As explained in Houghton (2024), some sources of complexity arise as a result of differences between the organisations taking part in problem resolution. We therefore have to consider human, socio-technical organisational factors which emerge as a result of this broader enterprise perspective.

By identifying some of the Defence organisational capability gaps in coping within complexity, this paper concludes with the recommendation that Defence should reject universalist approaches to standardised Defence organisations that are directed to conform to mandated structural templates, and instead develop methods for hybrid emergent organising.

Future demands arising from complexity on C2 Enterprise

Snowdon’s (2020) descriptions of the Cynefin domains highlight some of the significant organisational demands of complexity and wicked problems. The changing variety and nature of the problem types likely to be experienced by the future enterprises was described by Ritchey (2013) as combinations of complex, wicked, messes and social messes, however Defence will also continue to experience concurrent problem sets that are more ordered in their nature and thus demand less flexibility in organisational responses. This spectrum of possible capability demands is visualised in Figure 1, around the four Cynefin domains. It is likely that future defence situations will be characterised by all four domains simultaneously, hence magnifying the challenge for the Defence enterprise. ‘Jack of all trades’ Defence solutions that apply standardised hierarchical organisations (Figure 2) will remain useful for simple or complicated domain tasks. However, they will lack sufficient variety in capabilities in terms of different approaches, outlooks, skill sets and techniques to address the unpredictability of complexity or chaos.

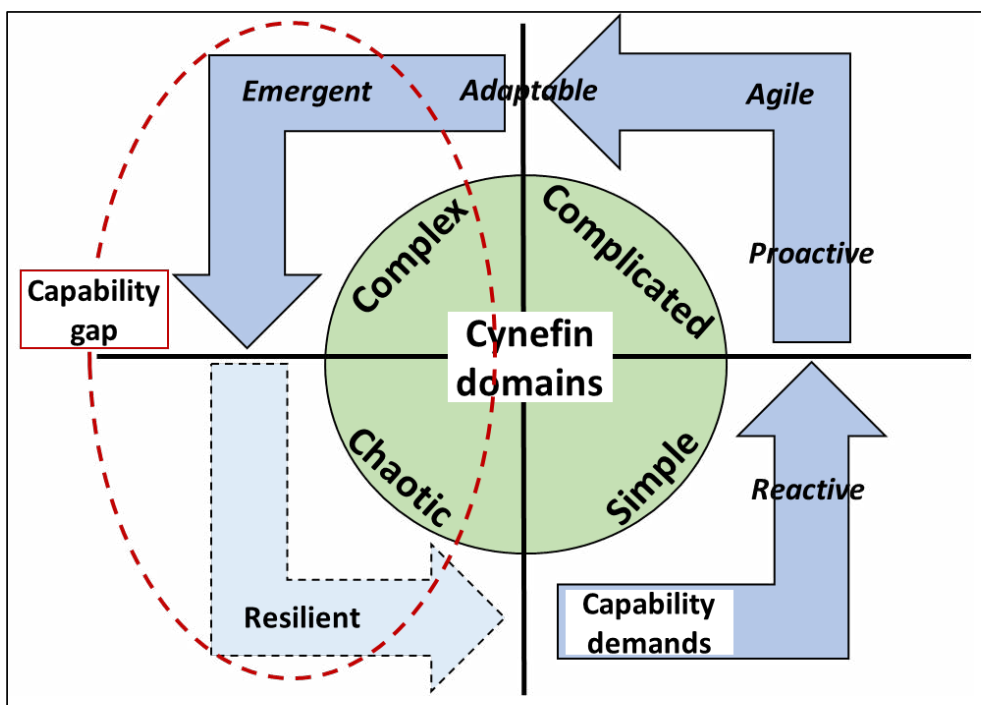


Figure 1. Organisational capability gap 1: Coping better with emergence and resilience.

Conceptual exploration of these capability challenge areas highlighted emergent organising as a core capability needed to cope within future complexity. Alongside collaborative networking, emergent organising can be described as a collaborative, systems of systems approach to internal and external networking will be key to development of flexible methods of organising. Whilst this has the potential to revolutionise Defence enterprise approaches through perpetual responses to change, the downside of this approach is the need for more flexible and highly skilled personnel. The demands arising from complexity are likely to go well beyond routine workforce approaches and hence demand more creative solutions. Leveraging the intellectual and innovative capital of workforces will consequently become critical activity alongside more decentralised decision making. Workforce empowerment through decentralised decision-making in alignment with overarching enterprise agility, has the potential to mitigate control pinch-points and single-points of process or bureaucratic failure.

Characterisation of the existing Defence organisational situation

Defence organisations have historically been designed and operated in manner which makes very different assumptions about the nature of the external problems they are addressing. In terms of Snowden's (2020) Cynefin domains they were either simple or complicated. The evolution of organisational structures witnessed a paradigm shift from the mechanistic principles of Taylorism to more agile and flexible ways of organising advocated by the likes of Drucker (2006), Gratton (2011) or Westbury (2022). The underpinning ideas of Taylorism remain useful in examining Defence hierarchical workforce control models (McChrystal, 2019). However, the more recent theories have significant potential for transformative organisational change, through motivating beneficial behaviours such as closer workforce integration, innovation and adaptability, to cope better in complex future scenarios.

Taylorism was developed in the early 20th century as a process control response to the challenges of industrial scale productivity and profit, from a low-skilled workforce, and was effective in optimising efficiency, production volumes, and speed and hence profit. This output-centric focus on process efficiency and profit required an analysis and control of labour workflows through top-down, templated control structures, separating managers from workers, with a universalist organisational approach and managerial standardisation of 'best-practice' tasks. Described by Ritzer (1993) as the "McDonaldization" and "formal rationalisation" of templated bureaucracy, Taylorism today can be criticised for its dehumanising systemic attitude towards the workforce. There are clear parallels to military hierarchies, with its prioritisation of system rules over unpredictable creativity, and its employment of bureaucratic control methods over more open and adaptive managerial freedoms. Much of contemporary global business has moved on, but the enduring parallels with UK Defence organisational structures remain obvious.

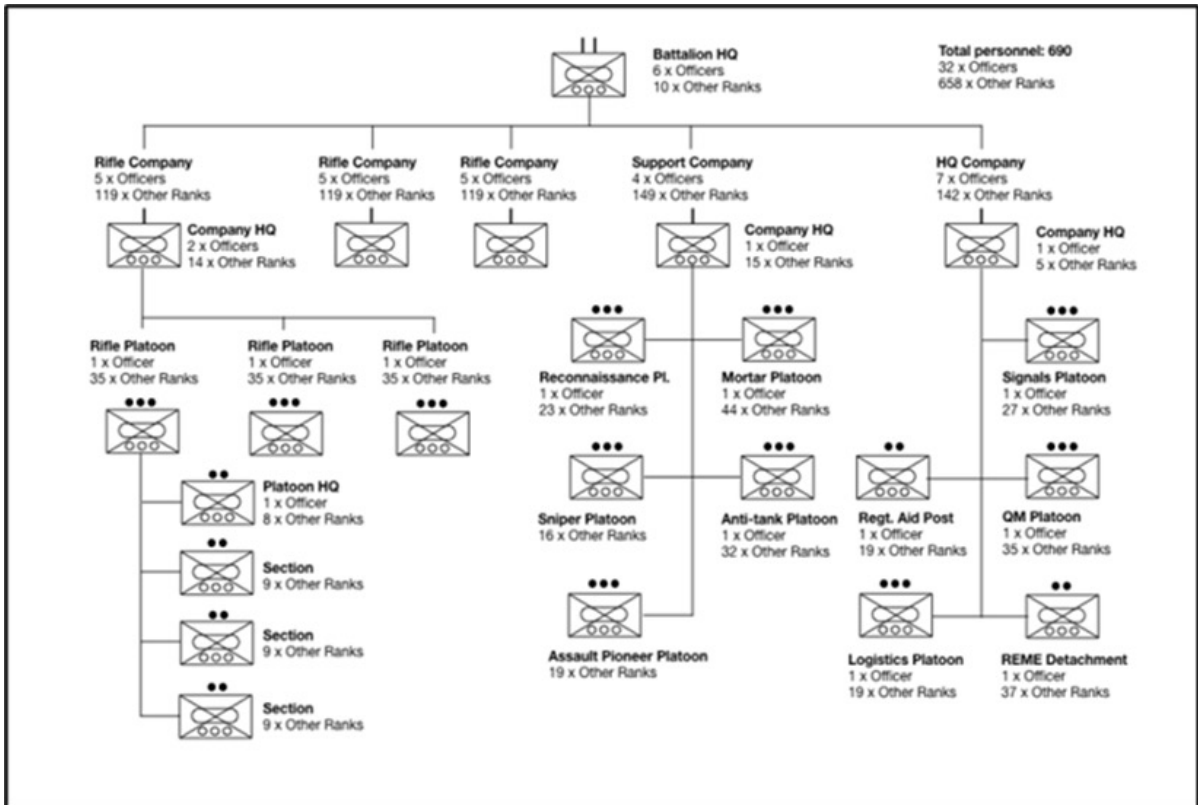


Figure 2. Organisational capability gap 2: templated military hierarchies.

In contrast to Taylor, both Drucker (2006) and Gratton (2011) advocated variations on a more human-centric managerial approach, emphasising the benefits of decentralised decision-making and diverse skills. Drucker’s focus on human potential highlighted the importance of effective workforce management to utilise people’s knowledge, experience and ideas through empowered decentralisation to exploit the benefits of intellectual contribution over manual labour. This concept of ‘Management by Objectives’ encouraged a shift away from hierarchical control to exploit the benefits of collaborative goal-setting between employees and management. Drucker’s emphasis on the empowerment of individuals aimed to reduce the rigid departmentalisation of Taylorism and elicit greater workforce responsibility for their own outputs. This highlights a correlation between the likely social and professional expectations of future Defence workforces (UK MOD, 2023), and how workforces are managed to achieve greater self-motivation. Workforce empowerment presents a complimentary approach for Defence. It leverages the best from recruits within tomorrow’s societies in which UK MOD (2024) predicts an increasingly broad diversity of individual identities, with greater expectations of professional empowerment than today.

As well as underlining the need to enhance the workforce sense of buy-in for organisational goals and objectives, the proposed shift away from hierarchical control generates new questions for Defence about how to work more effectively with a simultaneity of problem types. Workforces can be competent in thinking and operating in the simpler two Cynefin domains of clear and complicated, but UK MOD (2024) predicts the majority of future operational circumstances are going to have features of all of the various problem types to different degrees and in different ways. The question this therefore generates is how Defence addresses the gap in workforce capability to cope with the unknown, and transform towards a more agile, adaptive or emergent way of thinking – perhaps via a novel way of organising.

Comparing Taylorism with Gratton (2011) highlights contrasts in the organisational philosophies of UK business and contemporary defence. Hierarchical control within Snowdon's (2020) descriptions of simple or complicated domains can remain appropriate for reductive Defence planning and resource efficiency through standardised tasks. This approach to management comes at the expense of individual empowerment and innovation, and severely limits organisational scope to adapt to unpredictable future risks. PwC (2023) highlighted contemporary business demands for organisational resilience programmes, which they described as central to achieving competitive advantage within future complexity. In this work, PwC advocated for adaptable high-skilled teams, technologically empowered within flat leadership models to resist the disruption of future crisis, responding to changes as they occur. Drucker (2006), Gratton (2011) and PwC (2023) agree that the way forward is to have workforce-centric, decentralised approaches, with the ability to exploit the unpredictable opportunities of complexity through knowledge power and the potential of individuals to generate emergent responses. However, they achieve this at the expense of hierarchical control, and the Taylorist style 'managerial reassurance' oversight of contemporary manifestations of Weber's (2014) bureaucratic rationalism.

"Managers don't solve simple, isolated problems; they manage messes."

Russell Ackoff (2002)

Gratton's (2011) 'Future of Work'¹, advocates the use of more agile or adaptable organisational structures to better cope with the complexities of a rapidly changing global environment. She explored the impact of globalisation, changing demography and disruptive technologies on ways of working, and described how innovative cultures of innovation demand a departure from traditional Taylorist attitudes of using workers as mere component parts of a system. She also emphasised the need for organisational agility, introducing the concept of "agile organising," to exploit more flexible structures and continuous learning. Agility was a theme criticised by Snowdon (2020) as failing to go far enough to cope within complexity but was subsequently developed further in meaning and applicability by Westbury (2022). Organisational agility has potential to help develop Defence approaches to future organising, but it is not an answer in itself. By looking at Westbury's approach to agility as change between networks of networks, future organisational structures could respond more effectively to the shock of external unpredictability and harness the collective knowledge of more powerfully flexible Defence workforces, operating alongside varied and potentially novel partners.

Weber's (2014) original 'Herrschaft' described a power phenomenon to enable the efficient application of workforce competencies. However, the contemporary bureaucracy imposed within state-sector organisations such as Defence has become stigmatised through managerial limitations and control methods to mitigate a basic lack of trust in employees. Like Taylor, Weber's work focused on developing standardisable methods to template the process management of large quantities of relatively simple tasks or processes. Both concepts were developed to work in complicated competitive contexts, unimpeded by the complexity of closed-loop causality, but Weber's bureaucracy retains relevance through his descriptions of the need to exploit set-freedoms. Bureaucracy today has become synonymous with control, boundaries and limitations in state structures such as Defence. Across Defence organisational stove-pipes, there remains an enduring risk of bureaucracy misinterpretation and subversion into process blockers and oversight mechanisms – a manifestation of leadership

¹ Which is aligned with Ackoff's (2002) descriptions of the messy future challenges of the 21st century.

failures to trust, delegate and empower subordinates. A degree of hierarchical control is likely to remain necessary to direct and manage conventional military problems at scale (C2 in the traditional sense). This will continue to occur at multiple concurrent operational levels in multiple concurrent geographic locations and suggests that military hierarchical structures (and related workforce behaviours) will become increasingly sub-optimal within future complexity. They will need augmentation with more emergent capabilities that can cope with change at sufficient tempo to resist the stresses of complexity (Snowdon, 2020), and exploit opportunities faster than competitors. This scaling of organisational capability demands is visualised in Figures 1 and 3 as the requisite capability responses needed to become competitive within Snowdon's (2020) descriptions of the four Cynefin domains. Building from Houghton (2024), the dashed ellipse shows assessed Defence capability gaps within the complex and chaotic domains, where emergent effects will demand equally emergent and resilient capabilities to withstand the shock of uncertainty and then achieve competitive advantage, relative to the competition.

The closed-loop causality described in Jackson's (2019) complexity definitions, where actions and effects cannot be relied upon to lead to predictable outcomes, mean that globally dispersed organisations such as Defence, with multiple concurrent roles will therefore need access to a variety of concurrent methods of organising. Traditional military hierarchies are likely to retain a core role in hybrid characterisations of future conflicts that blur distinctions between the Cynefin domains but the concurrent realisation of simple (or clear?), complicated, complex, and chaotic Cynefin domains² will mean that future Defence organisations will have to cope with a spectrum of concurrent expected and unexpected effects and outcomes. This is visualised in Figure 3 as a characterisation of emergent effects.

Predictions of operational effects and outcomes for Defence activity, will be highly problematic within the unknowns of complexity. This is because of the systemic closed-loop potential of all actions to cause expected and unexpected effects, and an uncertainty of outcomes that could be advantageous, disadvantages, or both. Defence organisations use risk management in accordance with Joint Service Publication 892 (UK MOD 2016) to plan for uncertainty, but currently are only able to resource against Rumsfeld's (2002) 'known knowns' and 'known unknowns'. The uncertainty of complex operating environments demands that future Defence organisational structures will need the tolerance or resilience to survive the unpredictable, and then the requisite emergence to sense and respond to an endless cycle of change to achieve relative advantage. 'Victory' in tomorrow's operational environments could realistically be the competitor that performs least badly, despite the persistent likelihood of unexpected effects and outcomes.

² Note: Snowdon's (2020) use of 'domain' is unrelated to military doctrinal use of the same word and does not refer to Defence operational domains (Land, Maritime, Air, Space, Cyber and EM).

Emergent Effects Characterisation			
		Effects	
		Expected	Unexpected
Outcomes	Positive	Sense: Content Orchestrate: Plan to exploit	Sense: Luck Orchestrate: Learn and react
	Negative	Sense: Tolerance Orchestrate: Plan to risk manage	Sense: Shock Orchestrate: Resilience, learn and adapt

Capability gap

Figure 3. Organisational capability gap 3: Coping with unexpected effects and outcomes.

The organisational and behavioural implications of this effects characterisation will be significant. Defence personnel may be familiar with conventional operational environments where predictable effects can be seen to have positive and negative outcomes. However, the elevated likelihood of unexpected effects and outcomes caused by unpredictable complexity (described in Figures 1 and 3), justifies the need for a range of novel organisational capabilities, in addition to more conventional Defence roles and areas of specialism. Enterprise partnership with UK security and international partners, as well as functional specialist stakeholders from across the civil sector, academia, industry and NGOs activity are likely to lead to cultural intersections with multiple concurrent social, economic, and political influences. This could lead to a complex mess of closed-loop feedbacks, which risks further complicating Defence planning considerations of future activity and will prevent reductive approaches towards planning and problem solving.

Whilst Defence capabilities will remain only one means towards political strategic ends and are hence unlikely to hold decision-making primus-inter-pares between partners across government (PAG), Defence presents the only lever of political power with capacity for persistent effect at global reach. Whilst partnerships are outside the scope of this paper to examine in detail, there will be differing perspectives on issues, related to the priorities and varying influences of national and international partners. This will drive the need for more adaptive approaches to organising, to optimise work with different partners in different situations. Building emergent task-specific enterprises will need the capacity to organise and re-organise with teams of diverse partners (military and civilian), integrated physically or virtually, to mitigate the challenges of disparate physical locations. At times this may also need the ability for “switching or pivoting between activities with ease and at the right moment” (Westbury, 2022, p.14), which is typically impeded by bureaucratic hierarchies. Linear C2 hierarchical waterfall patterns that are enshrined in Defence operating procedures and staff manuals will retain a role in simple and even complicated Cynefin domains. However, a transition to more adaptable forms of Defence enterprise organising offers the potential for profound benefits within the rapidly evolving character of future complexity. An adapted application of PwC (2023) ‘crisis solutions’, could provide

Defence with the ability to replace departmental silos with a more flexible cross-functional enterprise approach. This could revolutionise Defence workforce management, replacing zero-sum reliance on self-imposed bureaucratic boundaries, with adaptive global enterprise nodes visualised in Figure 4. This form of Defence enterprise organising over a flatter leadership structure would be empowered to employ additional SME personnel and resources, from within or outside of Defence, bounded only by security, time and the strategic priority of specific tasks. To address diverse and ever-changing problem-sets, one potential option for more agile organising would be to create an enterprise based on a ‘flat-archy’ mix of functional group structures to enable adaptive teams that have different mixes of SMEs for specific challenges. Team selection of specialised individuals with task-specific capabilities, would leverage mission command and virtual communications to interoperate at reach. Such global defence nodes, led by appropriate military or civilian commanders dependent on appropriateness of responsibilities and location, would be trusted to hold local operational authority to draw on additional resources in accordance with higher intent. The objective would be to grasp temporal opportunities for strategic advantage – and here the possibilities would be significant. A visualisation of emergent team organising is shown in figure 4.

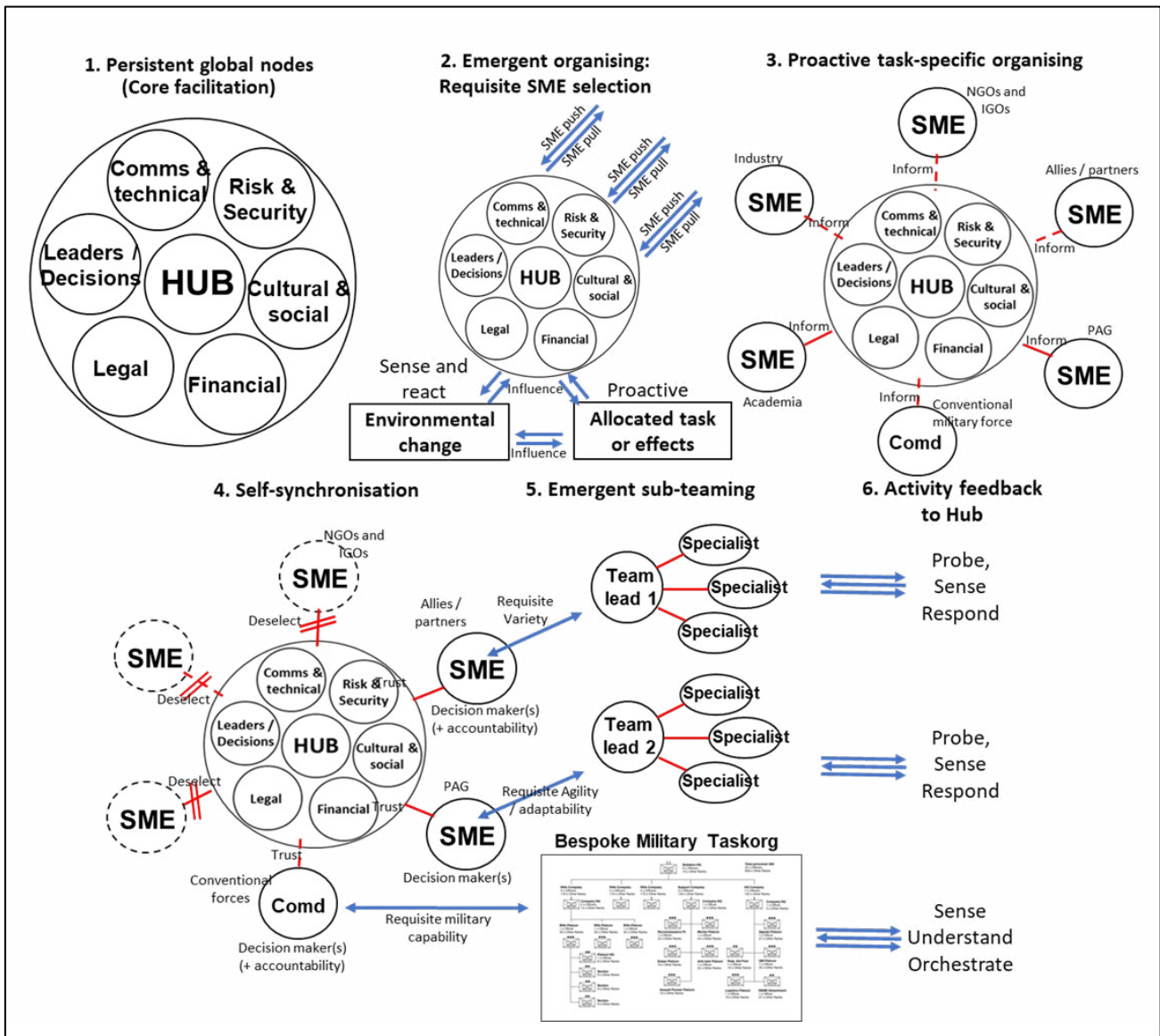


Figure 4. Emergent Defence organising.

It is argued that the benefits of emergent organising will likely outweigh the costs and should thus be viewed as non-discretionary to achieve competitive advantage over peer and peer (+) adversaries. Operating within complexity will unavoidably elicit second and third order influences on internal and external social dynamics that will feedback from and to complex operating environments, leading to a mix of predictable and unpredictable effects. However, the financial cost implications of transformative Defence organisational change could be significant, with more radical options likely to require reviews of defence spending and novel, more flexible approaches to strategic planning and resource allocation. The cognitive demands on individual members of the workforce will also be of note in workforce planning, and the persistent deployment of limited numbers of SMEs may result in demands for better terms and conditions of service, or elevated career opportunities consummate with the challenges. The impact of emergent operating within complexity could also increase mental stress by introducing constant engagement with uncertainty, potentially prompting workforce behavioural adaptations to cope. This could subsequently impact attitudes to risk and individual's willingness to experiment and innovate, unless these are strongly encouraged by leadership and rewarded in remuneration.

Transitioning from Organisation to Emergent Organising

The evidence discussed in this paper suggests that Defence will continue to require conventional organisational capabilities to compete with conventional adversaries in clear and complicated settings, where more sophisticated approaches would be overkill or possibly less effective when timeliness, simplicity and decisiveness are critical factors. However, concurrent to these demands, future Defence enterprise approaches within complexity will have to be starkly different from what they are today, with new forms of organising, new types of people, and new ways of getting the best from their skillsets. A potentially useful framework for thinking about this necessary organisation change is Michie et al.'s (2011) COM-B framework. This framework described how Capability, Opportunity and Motivation are the primary determinants of organisational behaviour, illustrated in Figure 5 below, and highlighting this paper's area of focus.

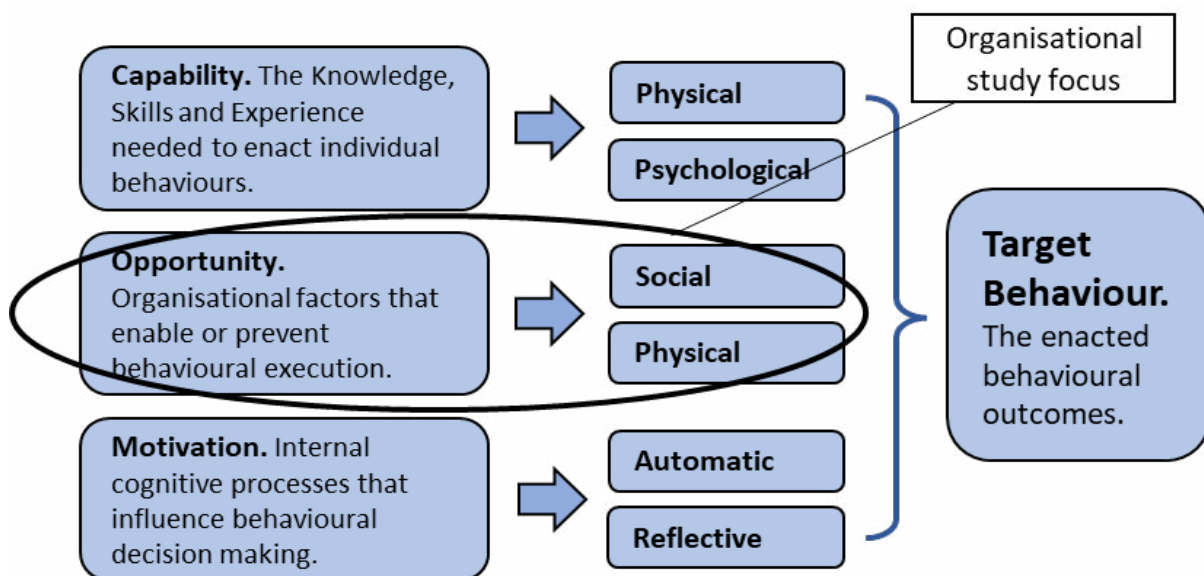


Figure 5. Adapted from Michie et al.'s (2011) 'COM-B' behaviour change framework.

The opportunity dynamics discussed in Michie et al (2011) describe some of the external factors affecting workforce behaviours such as environmental physical factors, contextual socio-political dynamics, or organisational structures. Further research is needed to make sense of the complexity of relationships between workforce behaviours and enterprise organising, however focused investigation has the potential to expand understanding of the opportunity dynamics linked specifically to organisational structures and ways of organising. Subsequent papers in this series will assess the potential impact on Defence organisational behaviours, and competitive potential within the complex future operating environments forecast in UK MOD (2024).

Conclusion

In the context of UK Defence re-shaping to address future complex challenges, this paper has explored the need for necessary organisational change within the Defence command and control enterprise. Building from the complexity described in Jackson (2019), Snowdon (2020) and Houghton (2024), the paper described the requisite organisational gaps to Snowdon's (2020) four Cynefin domains (Figure 1), and in coping with emergent effects (Figure 3). In examining some of the organisational limitations within current military approaches, the paper used the framework of Michie et al.'s (2011), COM-B organisational opportunity to visualise a gap between templated hierarchies and the requisite flexibility needed to address future complexity. Through this analysis, the findings suggest the need for further participatory action research to develop and test hybrid model approaches to emergent Defence organising (Figure 4) that are facilitated from flat-archies of persistent enterprise nodes.

Emergent organising within C2 for competitive advantage in complex future operating environments, as described in UK MOD (2024), is highly likely to demand dynamic variations of organisational inter-cooperation at greater tempo than adversaries. The argument laid out in this paper concludes that key to achieving this will be the enablement of opportunities to integrate diverse functional skill-sets, irrespective of their physical geography, and the provision of strategic leadership within an enterprise workforce that can learn, innovate and react at speed. Emergent Defence enterprise organising provides a mechanism to develop a much more effective future force. It consequently presents a non-discretionary method to address predicted gaps in UK Defence capability, and workable C2 constructs to deliver competitive advantage within the constantly changing character of complex environments of tomorrow.

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