CHAPTER 26

Revisiting the Synthetic Organisation: Multi-level Bricolage in Turbulent Environments

Eric-Hans Kramer, Guido van Os, Stefan Soeparman, & Robbert Verhulst

Abstract

Commentators and scholars have been reflecting on key lessons that can be drawn from the war in Ukraine. This chapter examines the challenge of developing a fluid response to a dynamic and complex environment and the ability to quickly assemble and disassemble organisational components in response to specific challenges or opportunities, from the perspective of organisational design of military organisations. To address this challenge, we revisit Thompson's 1967 concept of the 'synthetic organisation,' which is rapidly assembled from modular building blocks to respond to crises that are not yet fully comprehended. The synthetic organisation swings into action before it has fully developed its structure. This requirement to develop an organisational synthesis while being 'in action' resonates with later 'chaoplexic' images of modern warfare, as well as the importance of 'bricolage.' The ongoing conflict in Ukraine highlights the importance of support from the international community, including weapons, training, and intelligence, to aid the Ukrainian war effort. To adapt, the Ukrainian military has utilised unconventional tactics and tools to disrupt the enemy's decision-making cycle. We argue that the image of the synthetic organisation is useful for reflecting on the challenges military organisations face to accommodate a complex environment in which the need for chaoplexic warfare and bricolage are simultaneous realities.

Keywords: Synthetic organisations, Organisational networks, Sensemaking, Bricolage

1. Introduction

Most Western analysts seem to agree that the Ukraine conflict marks a geopolitical shift which results in a new strategic orientation for Western armies. Consequently, many European governments have increased military investments. While we do not dispute the emergence of this new strategic orientation, we think that a strategic shift toward large-scale military operations does not necessarily imply a return to Cold War-era organisational forms as well. Reports about the Ukraine conflict suggest that the network is a particularly relevant organisational form on

contemporary battlefields. Incidentally, we believe that the experience with operating in expeditionary taskforces in the last decades has taught valuable lessons to Western armed forces about the potential benefits and challenges of organisational networks. In this chapter, we explore the challenges faced by military organisations in contemporary conflicts, particularly in the context of the Ukraine conflict, by applying a specific conceptualisation of organisational networks.

Comprehending organisational dynamics requires an integrated account of the Ukrainian-Russian conflict. Such an account might appear quite complicated when the overall image of what is transmitted about the Ukraine conflict is considered. Particularly in the early stages of the conflict, small, semi-autonomous flexible Ukraine units were reported to be disrupting the advancement of the Russian army, supported by new technology (drones) and advanced satellite communication technology (Starlink). In later stages reports emphasise images of trench warfare and artillery barrages with huge losses on both sides of the conflict, which seems to be throwbacks to the First World War. Furthermore, the validity of reports is not without doubt, because of the inevitable strategic communication by all sides that have a stake in the conflict. Recognising the complexity of verifying information from diverse sources, we acknowledge that war reporting and systematic observation are distinct in their approaches. Our aim is to understand the organisational dynamics through a lens of synthetic organisational responses. By employing a theoretical framework to analyse a wide range of data from various news outlets, including analyses of the Institute for the Study of War (ISW) and the Center for Strategic and International Studies (CSIS), we shed light on how Ukrainian armed forces respond to the complexities and challenges of the modern battlefield. However, we also discuss the wider implications of these organisational dynamics and synthetic responses.

In this chapter we reflect on what we can learn from the experiences in the Ukraine conflict as they are communicated through different reports, newspaper articles and individual accounts. Our primary objective is to untangle the organisational dynamics of the Ukrainian army and its organisational capacity to respond to the challenges in the current battlefield environment. We will begin (1) by introducing the concept of synthetic organisations, which assist in understanding how the Ukrainian armed forces react to the complex and unpredictable events on the modern battlefield. (2). We apply this concept to interpret four intricate organisational dynamics we uncovered during the analysis of multiple sources regarding how the Ukrainian military responded to new developments in the Russian-Ukrainian conflict (3). Furthermore, we discuss the wider implication of a synthetic approach to the military in general. More specifically, we focus on the organisational challenges armies face in contemporary conflicts (4). This means that we do not discuss geopolitical or strategic implications. We focus, however, on the wider organisational implications of the modern battlefield.

2. The synthetic organisation

It has been well established in military studies that during deployment, armies are potentially confronted with danger, intelligent opponents that aim to undermine them and with unexpected events. In organisation science these conditions are currently typically referred to as VUCA (volatile, uncertain, complex ambiguous) environments. The challenge for hierarchically stratified systems[1] in such conditions is to develop and maintain a level of functional integration.[2] Also, Von Clausewitz has put the significance of uncertainty central in his way of thinking about war.[3] In organisation science it is commonly accepted that VUCA environments cannot be exhaustively represented in images, maps, or models. Instead, 'organising' in such environments takes place against the background of inevitable – ultimately not reducible – uncertainty. Activities of organising are necessarily 'directed toward the establishment of a workable level of certainty.'[4] Translated to the conditions of armies, this idea implies that the 'fog of war' might be dealt with pragmatically but cannot ultimately be lifted.

Organisation theorist James Thompson introduced the concept of 'the synthetic organization' in 1967 to characterise the challenges of large hierarchically stratified organisations that are deployed to fight crises. We consider this concept to be particularly relevant because it designates at a profound level a problem of organisations that are deployed in VUCA conditions. In Thompson's portrayal, the synthetic organisation needs to deal with several interrelated problems and is challenged by inner contradictions: 'The synthetic organization must simultaneously establish its structure and carry on operations. Under conditions of great uncertainty, it must learn the nature and extent of the overall problem to be solved and the nature and location of relevant resources. At the same time, it must assemble and interrelate the components, and it must do all this without the benefit of established rules or commonly known channels of communication. The synthetic organization cannot take inventory before swinging into action.'[5]

[1] A hierarchically stratified system is a system that is internally built up of subsystems (Simon, 1962).

[2] Kramer and Moorkamp, "Understanding organizational vulnerability in military taskforces."

[3] Von Clausewitz, 140: 'From this uncertainty of all intelligence and suppositions, this continual interposition of chance, the actor in War constantly finds things different from his expectations; and this cannot fail to have an influence on his plans, or at least on the presumptions connected with these plans. If this influence is so great as to render the predetermined plan completely nugatory, then, as a rule, a new one must be substituted in its place; but at the moment the necessary data are often wanting for this, because in the course of action circumstances press for immediate decision, and allow no time to look for fresh data, often not enough for mature consideration.'

[4] Weick, *The Social Psychology of Organizing*, 3.

[5] Thompson, *Organizations in Action. Social Science Bases of Administrative Theory,* 52-53.

Thompson developed the idea of the synthetic organisation after observing crisis-organisations that – for example – need to respond to earthquakes. At the beginning it might not be very clear what areas are affected the most, what help might specifically be needed, how such areas may be entered, what resources are needed to enter areas, etcetera. This has significant consequences. Such a crisis-organisation needs to act before it has been able to work out these issues. While it has already swung into action, it needs to develop understanding of the nature of the problem, it needs to scramble resources and work out an organisation that can tackle these issues. Particularly in reactive environments, the activities of the synthetic organisation might provoke intelligent responses from opponents which significantly complicates things.[6]

The resulting synthetic organisation is an essentially disharmonious system in which the requirement to deal with one problem (the lack of established rules or commonly known channels of communication), prevents the ability to deal with another (assembling and interrelating components), while solving these interrelated problems is hampered by yet another (the need to learn the nature and extent of the overall problem), while all of these issues are complicated by a necessity to act. The synthetic organisation is an ideal type – it signifies in a pure form a struggle of a large crisis organisation in VUCA conditions – but certainly not an ideal organisation. It is an ideal type of an organisation whose functional integration needs to be established and reestablished from moment to moment, while an extreme VUCA environment continuously threatens organisational disintegration. The concept of the synthetic organisation therefore indicates that taskforces that are deployed in these conditions are on a profound level organisationally vulnerable.

The image of the synthetic organisation can be understood as an early account of a network organisation that needs to be hyperflexible in an extremely demanding environment. In such environments an organisation requires a capability to (continuously) shape and reshape, which results in evolving networks that develop from the bottom up rather than being designed and controlled top down in a traditional sense.[7] The concept of the synthetic organisation has been used before to understand the dynamics in military taskforces deployed in post-conflict missions.[8] Kalkman observes comparable patterns in military disaster response operations.[9] In these analyses, the interrelated issues of building a taskforce out of a selection

[6] Emery, *Futures We're In*.

[7] Kuipers, Van Amelsvoort, and Kramer, *New Ways of Organizing. Alternatives to Bureaucracy*, 123.

[8] Moorkamp, *Operating Under High-Risk Conditions in Temporary Organization. A Sociotechnical Perspective*.

[9] Kalkman, "Radical and swift adaptive organizing in response to unexpected events: Military relief operations after Hurricane Dorian."

of (sometimes unfitting) building blocks, in response to a VUCA environment was underlined (Kramer, 2007).[10] Further observed was that such taskforces, being made up of building blocks selected from a parent organisation, were structurally underdeveloped at the onset of those missions, while at the same time they could not wait until they had figured out a workable organisational form.[11]

Because the concept of the synthetic organisation is an ideal type that indicates the vulnerability of a hierarchically stratified network organisation in VUCA conditions, we believe that it is valuable as a perspective to make sense of organisational issues in the Ukraine conflict as they appear in different reports. In the next paragraph we turn to these reports and analyse what becomes visible if the concept of the synthetic organisation is used. In the subsequent paragraph, we place the implications of these findings in a wider frame and relate them to contemporary discussions in military studies.

3. What do existing reports on the Ukraine conflict suggest?

The concept of synthetic organisation can help to understand how the Ukrainian army manages and addresses the organisational challenges they encounter on the modern battlefield. Numerous news outlets and research institutions have strived to comprehend both its current developments and historical background. Amidst the wealth of sources, several intriguing, albeit possibly conflicting, organisational dynamics emerge which will be analysed through the lens of synthetic organisational responses.

The first notable dynamic revolves around decentralised units in the Ukrainian armed forces that offer flexibility to organise a quick response. In a New York Times article titled 'A Brutal Path Forward' the focus is placed on the Ukrainian offensive, which progresses methodically, village by village.[12] This approach underscores the significance of numerous small assault teams, often consisting of 8-10 soldiers, engaged in house-to-house and street-to-street combat. Once a street is secured, reconnaissance drones are dispatched to inspect any remaining Russian-held buildings. The Ukrainian armed forces adopted a decentralised mission command, often referred to as the 'island of forces' strategy.[13] This approach empowers platoon commanders to adapt their tactics dynamically to the evolving battlefield

[10] Kramer, *Organizing Doubt. Grounded Theory, Army Units and Dealing with Dynamic Complexity*.

[11] Kramer, Moorkamp, and Visser, "Learning to organize and organizing to learn: The case of Dutch military expeditionary task forces."

[12] Santora, "A brutal path forward."

[13] Cháves," Learning on the fly: Drones in the Russian-Ukrainian War."

conditions. Early in the conflict, as a quick response, these units performed local counter offences acting as an uncoordinated network. Consequently, smaller, dispersed units demonstrated their ability to ambush and disrupt Russian troops effectively.[14] This tactic was also seen during the Battle of Bakhmut – according to assessments of the Institute for the Study of War (ISW): 'The Russian MoD (ministry of defence ed.) acknowledged the Ukrainian counterattacks uncharacteristically quickly.'[15] Although there was insufficient information, the decentralisation of command helped to cope with a volatile, uncertain, complex, and ambiguous environment where an intelligent opponent annexed large parts of the country (coping with challenges of the VUCA environment). However, as reporting shows, it also resulted in uncoordinated and fragmented actions, as mentioned by Hall in the Financial Times: 'One of the reasons it was so decentralized was the system wasn't prepared for a crisis,' said an adviser on defence and intelligence in the Ukrainian government. 'People had to do what they had to do. We're not in that position anymore. The bureaucrats are back in Kyiv.'[16] Local and loosely coordinated operations – executed by decentralised units – are a reaction to a dynamic and unpredictable crisis. However, as the conflict unfolded a more centralised command and control structure was increasingly necessary to effectively oversee and coordinate counterattacks. Decentralised units became operational building blocks (as coordinated parts of a network) within a more traditional brigade. Charlotte Gall of The New York Times, after conversations with frontline commanders, emphasises, 'They have worked out how to manage the training of fresh soldiers and how to keep replenishing their ranks after losses, even while continuing to fight. Almost every unit has grown in professionalism and size: Battalions have turned into brigades, and volunteer groups into formal army units.'[17]

The second noteworthy dynamic revolves around the rapid adaptability of the Ukrainian armed forces to use new equipment and technological innovations. At the start of the conflict, there was insufficient information on how the battlefield would unfold, and which recourses would become essential. The Ukrainian government needed to act before it was able to work out future developments, let alone how to organise for that. Given this uncertainty, the Ukrainian army scrambled as many resources together as possible to deal with future complexities (determining relevant inventory). International support resulted in the delivery of, among other things drones, the F16, and PhZ 2000. The challenge then was to use the equipment optimally. Ukrainian soldiers have displayed a high level of skill and ingenuity in

[14] Hall, "Military briefing."

[15] Institute for the Study of War -01"Russian offensive campaign assessment."

[16] Hall, "Military briefing."

[17] Gall, "On the front line."

leveraging available resources, experimenting with them promptly and improvising when necessary.[18] For instance, the PzH 2000, supplied by Germany and the Netherlands, was seamlessly integrated into the CIS Arta application, an asset the Ukrainian army had been utilising since 2014.[19]As elucidated by Michael May in a 2022 article, 'When Ukrainian military or reconnaissance drones detect an enemy's position, they relay their findings to the system. Subsequently, the technology rapidly identifies artillery units, mortars, missiles, or combat drones within range and determines the most suitable type of artillery for neutralizing the threat. GIS Arta can execute this entire operation in less than a minute.' The example of the PzH 2000 demonstrates the ability to quickly adapt and implement new technologies.

The Ukrainian army also uses off-the-shelf technology. Through improvisation, commercial drones are being deployed with 3D-printed grenade holders to attack Russian tanks. In an article published on the online outlet Unherd, frontline journalist David Patrikarakos paints a vivid picture of the use of drones by engaging with an officer known as 'Coyote,' who: with a grin, retrieves a small blue object, a six-inch rocket with three fins crowned by a golden dome. 'We manufacture it using a 3D printer.[20] It costs approximately $30,' he proudly explains. 'We load it with explosives and then attach it to one of our drones… and release it.' Another officer elaborates: 'Not long ago, we relied on large, expensive tactical drones specially designed for military use. But now, small and medium-sized civilian drones have evolved into distinct military units because of their capacity to inflict significant damage on the enemy.'

A third significant dynamic is the reliance on allies and commercial entities for essential resources. Recently the NATO members, again, announced an aid package.[21] The support of allies is of utmost importance to gain an operational and tactical advantage on the battlefield. However, continually translating demands of Ukrainian armed forces into newly provided equipment, also constitutes a tactical vulnerability and requires organisational flexibility. For example, the CIS Arta is connected to acquired drones and a donated PzH 2000 and operates through a connection provided by StarLink. While Starlink's internet connection and the equipment provided by NATO offer distinct advantages, they also increase dependencies. While allies are willing to assist, political and strategic discussions within and among nations can increase as the conflict prolongs. The reliance on an international network introduces a level of strategic (geo-political) complexity that can have far-reaching implications on the frontline. This is a risk when allies scale

[18] Cháves," Learning on the fly: Drones in the Russian-Ukrainian War."

[19] May, "The GIS Arta system."

[20] Patrickarakos, "The madness behind the battle of Bakhmut."

[21] Institute for the Study of War-02, "Russian offensive campaign assessment."

back the supply of equipment or cease military training. Also, StarLink can decide to suspend services, which would directly impact the interaction between military units and the use of weapon systems like drones.

A fourth important dynamic are the strategic and tactical shifts demanded by the progress of war and changing conditions of conflict. The Ukrainian army demonstrates organisational flexibility in adjusting to changes on the battlefield. Recent reporting by The Institute for the Study of War indicates that without knowing all the details, the Ukrainian infantry tries to gain control by using the information at hand to understand these new conditions; adjusting its strategy accordingly and acting before the situation is fully crystallised. The Institute for the Study of War provides an example; 'A Ukrainian soldier analyzed the footage of the area and noted that the aforementioned Russian-controlled trench is a strongpoint in an interconnected system of trenches, firing systems, and dugouts that lie between Robotyne and Novoprokopivka.[22] The Ukrainian soldier noted that the trenches are connected by underground tunnel-like structures and that Russian forces are prioritizing the defense of these positions, which have tactical significance in the area between Robotyne and Novoprokopivka.' The Russian army's trenches made Ukrainians alter their tactical approach so as to effectively counter this situation. Although drones play a significant role in disorienting the enemy and scout the area hovering above the trenches for intel on the location of trenches, the storming of trenches hearkens back to First World War and Second World War tactics.[23] Although the Ukrainian army has a lot of technology at hand, a commander states in an article by Andrew Kramer of New York Times, that fighting in trenches is 'boots on the ground' infantry warfare. 'But taking a trench is difficult soldiering. It depends on careful planning around the peculiarities of the landscape and the weather and the actions of individual soldiers, said Kozak, the commander [...] The goal is to get as close as possible before the enemy has an opportunity to fire on the soldiers, who are open and vulnerable as they maneuver.'[24]

These four dynamics shed light on the ability of the Ukrainian military organisation to react to unexpected events in warfare. The concept of the synthetic organisations helps to understand these dynamics and provide a theoretical understanding of how Ukrainian military dealt with unpredictable situations where there was inadequate information. They are forced to act before the necessary resources are in place and need to be able to deal with dramatic strategic shifts. It emphasises that in conditions that require hyperflexibility, organisational networks assemble and connect disparate elements. Depending on specific circumstances different

[22] Institute for the Study of War-03, "Russian offensive campaign assessment."

[23] Patrickarakos, "The madness behind the battle of Bakhmut."

[24] Kramer, "Storming a trench is treacherous business."

internal strategies are necessary. These require the ability to work with what is available, rather than waiting for ideal conditions or resources to be in place before acting. They furthermore need to innovate technologically which results in an evolving sociotechnical network in which technological and social aspects need to be viewed in concert. Above it was emphasised that above and beyond other views on network organisations, the concept of the synthetic organisation emphasises the vulnerability of networks. This vulnerability appears to characterise/ be reflected in the Ukraine conflict. For example, the uncoordinated actions of decentralised platoons to cope with unpredictability and the dependence on international network partners for equipment and political support. Thompson suggests that an organisation with synthetic characteristics experiences conflicting demands for which no magic solution is available. The nature of the overall problem the organisation is focused on, is unclear. As a result, goal-oriented and coherent behaviour of a system is difficult; an organisation inevitably needs to swing into action while components still need to be assembled and interrelated, without being able to figure it all out first. The following section will delve into these implications in more detail.

4. Wider implications of adopting the synthetic organisation perspective

After the discussion of the reporting about the Ukraine conflict in the previous paragraph, we want to place the implications of these findings in a wider frame and relate them to contemporary discussions in military studies. In our view, the concept of the synthetic organisation makes specific organisational issues visible which has implications for military organisations in VUCA environments. We need to repeat the qualification that these should be understood as preliminary insights that require further empirical investigation before they can be validly related to events in the Ukraine conflict.

4.1 The chaoplexic paradigm and organisational networks

Above it was emphasised that the synthetic organisation can be seen as an early account of a network organisation, with a distinct emphasis on the vulnerability of such organisations in VUCA environments. The reports about the Ukraine conflict seem to confirm this trend towards constantly evolving networks in response to a VUCA environment. In the realm of military studies, the idea of the network organisation has been prominent since the 1990s. Bousquet has postulated the chaoplexic paradigm in military thinking to denote this development. In his view, this paradigm emphasises the importance of self-organising networks and the ability to

deal with chaotic and complex environments: 'Building on the original insights of chaos theory, complexity scientists turned to the interactions of the different component parts of living systems, and particularly to the new properties and behaviours constituted through the networked self-organization of autonomous agents. Self-organization is the process by which the autonomous interaction of individual entities results in the bottom-up emergence of complex systems, systems composed of many parts which are connected in a non-linear fashion.'[25]

The doctrine on network-centric warfare (NCW) adopted by the Pentagon at the turn of the century is seen by Bousquet as a key event that signifies that development. This doctrine envisions autonomous swarming and self-synchronising warfighting, with units connected by high-speed datalinks which are thought to create a superior battlefield awareness. This development is afforded by advanced (digital) technology. The awareness, speed and proactiveness of resulting networks is thought to be able to undermine the organised coherence of an opponent.[26] These developments are supported by a radical implementations of mission command theory.[27] The resulting military organisation is seen as a dynamically reconfiguring swarm of specialised components that operate like different cells in a body.[28] At the core of this process of self-organisation, the OODA loop (observe–orient–decide–act), formulated by Air Force Colonel Boyd describes the decision-making in combat. Bousquet emphasises that while this OODA-loop is at first sight reminiscent of a traditional cybernetic feedback loop, Boyd considered the orientation phase as part of a perpetual process of 'destruction and creation.' Therefore, according to Bousquet, the OODA-loop is meant to characterise more than a straightforward control loop that describes various stages of information processing.[29] The chaoplexic paradigm conveys an image of future military organisation that is in many ways the opposite of the traditional image of an inflexible top-down controlled hierarchical mechanism that operates according to detailed specifications.

Against the background of this development in thinking about military organisations, the concept of the synthetic organisation is valuable because of its emphasis on vulnerability. As we have seen, the concept of the synthetic organisation emphasises the process of assembling and connecting units in response to an uncertain environment and emphasises the importance of proactiveness. Yet, the synthetic organisation is portrayed as an essentially disharmonious (networked) system that needs to develop an organisational synthesis while in action.

[25] Bousquet, "Chaoplexic warfare or the future of military organization," 924.

[26] Cebrowski and Garstka, "Network-centric warfare: Its origin and future."

[27] Alberts and Hayes, *Power to the Edge: Command and Control in the Information Age.*

[28] Bousquet, *The Scientific Way of Warfare. Order and Chaos on the Battlefields of Modernity.*

[29] Bousquet, "Chaoplexic warfare or the future of military organization."

The necessity of needing to respond quickly to an unknown environment with an underdeveloped system makes this lack of harmony inevitable. The reports about the Ukraine conflict seem to confirm this underlying messiness. Chaoplexic ideas about continuously reshaping, dynamically reconfiguring networks and about dealing with chaos proactively, can therefore divert attention away from messy processes underneath. This can lead to a far too optimistic view on the ability to create autonomous, self-organising, swarming military units.

4.2 Sensemaking versus information processing

The concept of the synthetic organisation indicates that the initial problem that is confronted by networked organisations in VUCA environments is a problem of 'meaning' before 'information processing.'[30] This indicates that organisations need to make sense of things before they have sufficient information, or even have something that can be called 'information' in the first place. Sensemaking refers to a process by which individuals and organisations interpret and give meaning to their concrete experiences, taking cues from their environment to make sense of ambiguous or uncertain situations.[31] In VUCA environments (and as we have seen above), sensemaking precedes the ability of an organisation to bracket relevant 'information' and to work out a fitting design to systemise collective action.

This is significant, because the image of the synthetic organisation points to certain weaknesses in a one-sided emphasis on information processing in contemporary discussions, more specifically the view that the speed of information processing between actors and nodes in a network is a deciding factor in modern day conflicts. According to Bousquet, this emphasis on the speed of information processing is a flawed interpretation of Boyd's OODA-loop: 'Indeed, it is crucial to note that when Boyd talks about a "quicker OODA loop," he does not simply mean cycling through the sequence of observation-orientation-decision-action faster but rather is referring to all the cross-referencing connections that make the OODA into a complex adaptive system. […]. Novelty, ambiguity, and deception are thus crucial to surprising, shocking, disorienting, and disrupting the adversary. Merely increasing the speed at which one acts by responding to stimulus from pre-established templates (i.e. without truly orienting) is not in itself a quickening of the OODA loop, a point missed by many subsequent theorists.'[32]

[30] Weick, *Sensemaking in Organizations*, 15.

[31] Weick, *Making Sense of the Organization.*

[32] Bousquet, *The Scientific Way of Warfare. Order and Chaos on the Battlefields of Modernity*, 182-183.

In Bousquet's account of the OODA loop, it is 'orientation' that occupies the place of sensemaking. Orientation from this perspective refers to reflection on the other steps of the loop, which is the reason why in this account it is not so much the speed but the quality of decision making that is key. The core of Bousquet's argument is that trying to create a 'quicker OODA-loop' is a valid strategy when there is certainty about the validity of the information that is being processed. However, this assumption contradicts notions about a fog of war, about chaoplexity or more in general about a VUCA environment. The last paragraph will go deeper into this point.

4.3 Sensemaking and bricolage

Many studies underline the importance of sensemaking, but few open the black box of sensemaking itself.[33] For that reason, different studies have called for attention on 'normal work' (everyday experiences) of frontline operators.[34] What such studies indicate is that sensemaking during everyday frontline work hardly is an abstracted rational process. In normal work of frontline operators, the conflict between a VUCA environment and existing structures and routines becomes visible. In such cases operators need to find pragmatic solutions and quickly learn from their outcomes. In organisation sciences, the phrase bricolage is often used to refer to this character of a sensemaking process.

Bricolage refers to an ability to improvise – to act without a script and make do with what's available. The bricoleur does not work with a fixed and unchangeable blueprint, operating procedure, or script, but explicitly relates to his environment in a flexible way and adapts as necessary. Bricolage implies a certain nimbleness, an agility to think and act spontaneously on one's feet or in the moment.[35] It is also tied to the reality of everyday work practices. Bricolage requires making the most of available resources, information, and materials by combining them in novel and previously unforeseen ways.[36] This requires a degree of latitude or discretion to determine feasibility. In this sense, bricolage is a strategy of 'minimal structuring,' where the setting of goals does not pre-determine how people should act to achieve

[33] Moorkamp, *Operating Under High-Risk Conditions in Temporary Organization. A Sociotechnical Perspective*.

[34] Kalkman, "Radical and swift adaptive organizing in response to unexpected events: Military relief operations after Hurricane Dorian."

[35] Sunduramurthy, Zheng, Musteen, Francis and Rhyne., "Doing more with less, systematically? Bricolage and ingenieuring in successful social ventures."

[36] Baker and Nelson, "Creating something from nothing: Resource construction through entrepreneurial bricolage."

those goals.[37] There is a tendency towards unconventionalism, nonconformism and a non-hierarchical approach. As Hadida et al. write, '[It] relies on good communication [...] and on striking the right balance between top-down, pre-planned, explicit, and centralized structuring mechanisms developed to deal with most contingencies [...], and bottom-up, emergent, and more diffuse improvisation and local adaptation to deal with the unforeseen at the task level.'[38] Bricolage allows for unorthodox views and involves a course of action in which different perspectives are considered. In that sense, bricoleurs are designers, but not designers that aim at developing a fixed blueprint.

The concept of the synthetic organisation adds an additional dimension to the notion of bricolage. In organisational science, bricolage is often portrayed as a process occurring within the boundaries of a team or a small group. However, what distinguishes the synthetic organisation is its composition of diverse components that require assembly. The intricacies of designing such an assembly emerge after the organisation has already sprung into action. As a hierarchically stratified organisation, the synthetic organisation is not only confronted with a micro-design issue (how to deal with a particular pragmatic issue), but also with a meso-level design issue (assembling and interrelating components) and a strategic issue (learning the nature and extent of the overall problem to be solved). Sensemaking and bricolage at the micro-level may influence the interrelating of components at the meso-level, which in turn may influence the strategic macro level of a network. In fact, microlevel bricolage may have unforeseen consequences at the meso and macro level. This is a main issue studied by Moorkamp in his analysis of safety in a military taskforce – internally built up of different units from the parent organisation in the Netherlands – during an expeditionary mission.[39] Therefore, we propose to see 'bricolage' in synthetic organisations not merely as a micro level process, but also as a process that takes place in relation to meso- and macrolevels.

This indicates that the experience with working in expeditionary taskforces that Western armies have built up in the last decades might have led them to be confronted by the demands of synthetic organising. Although these expeditionary missions were conducted in a different geopolitical period and although the contemporary geopolitical context might require armies to prepare for more traditional warfighting missions, they might have taught western armies relevant lessons about synthetic organising.

[37] Cunha, Clegg and Cunha, "Structuring for globalization: The minimal network."

[38] Hadida, Tarvainen and Rose, "Organizational improvisation: A consolidating review and framework," 451.

[39] Moorkamp, *Operating Under High-Risk Conditions in Temporary Organizations. A Sociotechnical Perspective*.

5. Concluding remarks

This chapter is a first attempt to understand the organisational dynamics in the Ukraine-conflict, by using existing organisational concepts as tools to find patterns. The concept of the synthetic organisation draws attention to the important capability of organisations to quickly assemble, connect and dissolve building blocks in quick response to a particularly turbulent VUCA environment, in which the necessity to act in many ways has priority over the importance to understand. The synthetic organisation is tangled in a knot because it cannot take time to take inventory before it swings into action, is unsure about what goals are achievable at the onset, and what relevant resources are. This obviously means that it is difficult to assemble and relate components. These characteristics could be observed in reporting about Ukraine. That means that there is a lot of potential for misadventure in synthetic organisations, which cannot be ironed out through some organisational 'magic bullet.'

The concept of the synthetic organisation underlines that this struggle is an inalienable characteristic of hierarchically stratified organisations that are deployed in VUCA conditions, in which the uncertainties of these environments cannot be transformed into certainties beforehand. Bousquet criticises certain solutions proposed in military thinking that assume that the 'fog of war' and the uncertainties of the battlefield can be mitigated.[40] While it is often assumed that technology can transform uncertainty into certainties – digital technologies that are believed to achieve 'information superiority' – the concept of the synthetic organisation makes clear that it is risky to put too much trust in that route because technology cannot solve the problems of the synthetic organisation at the most profound level. The reporting about the Ukraine conflict indicated the importance of technology and the effort that was put into the implementing drones and satellite communication. However, the concept of the synthetic organisation makes clear that technology did not fundamentally solve the problem of sensemaking. Instead, frontline reporting sketches a timeless account of soldiers coping with the extreme demands of frontline battle, with the useful and essential help of modern technology. What appears from reporting is not a friction-free hypermodern system.

[40] See Bousquet, *The Scientific Way of Warfare. Order and Chaos on the Battlefields of Modernity,* 208: 'In this way, Clausewitz's assertion that "a great part of the information obtained in war is false, and by far the greatest part is of doubtful character" could be dismissed as an antiquated state of affairs banished by technological progress rather than the reflection of a more enduring condition of armed conflict. However, such a perspective rests on several crucial assumptions such as the infallibility of sensors and computer systems, the inability of adversaries to fool sensors and intentionally create a misleading picture, and that the accumulation of information naturally leads to an unambiguous, consensual interpretation of reality.'

Instead, reporting indicates a kind of banal pragmatism that is transformed into an art of bricolage – with the help of technology. While it might be pointed out that the Ukraine army hardly is an example of an army that was perfectly prepared for this conflict, the concept of the synthetic organisation points out that pragmatic struggles are a fundamental characteristic of hierarchically stratified organisations that need to operate in VUCA environments.[41]

Now that we have analysed reports from the Ukraine-conflict by using the concept of the synthetic organisation and indicated specific challenges for hierarchically stratified networks in VUCA conditions that are not easily solved, what can we learn from this for the effective organisation of armed forces? Based on this preliminary analysis, a few issues appear relevant. While we may have entered a new geopolitical era, that does not mean that we should go back to the era of large – prefabricated – standing armed forces. While the Ukraine conflict certainly has indicated that – for example – the concept of combined arms is not outdated, that does not mean that it needs to be achieved in quite the same way. Therefore, the network regime is a relevant sociotechnical basic form that needs further attention. Particularly in innovation projects, there is an important hazard that new and advanced technology is indeed implemented, only that it gets to be 'bolted to an old organization.'[42]Adding to that, a basic sociotechnical design rule is to de-complexify systems, to avoid the spiraling interconnectedness between nodes.[43] When applied to the network regime, 'just connect everything together through datalinks' is not a sociotechnical design strategy. At the onset we mentioned that during the expeditionary missions of the previous era, the Netherlands armed forces has built up a lot of relevant experience with synthetic organising and particularly in the realm of special forces there are experiments with network forms. Perhaps these can form the basis of a sociotechnical innovation strategy that aims at exploiting the potential benefits of the network form.

[41] Also take Bousquet's critique on recent developments in military thinking into perspective, that argues that AI and machine learning can improve information processing speed (i.e. quicken the OODA loop) by automating decision making (recent concepts like 'hyperwar' point into that direction): Bousquet, *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity,* 231.

[42] Kramer and Van Os, "Digitalisation, organising and organisational choice: Exploring the challenges of digital transformation using five applied sociotechnical lenses."

[43] Kuipers, Van Amelsvoort and Kramer, *New Ways of Organizing. Alternatives to Bureaucracy.*

Eric-Hans Kramer

Eric-Hans Kramer is professor in Military Management and Organisation at Faculty of Military Sciences, Netherlands Defence Academy. Before that, he was associate professor of Human Factors and Systems Safety at the same organisation. His research focusses on sociotechnical innovation strategies against the background of contemporary organisational challenges of the military organisation in general and taskforces in particular. Furthermore, he is involved in developing interdisciplinary research, educational programs and in supervision of PhD projects.

Guido van Os

Guido van Os is assistant professor of Organisational Science and Management at the Faculty of Military Sciences, Netherlands Defence Academy. He holds a PhD in Public Administration from Erasmus University Rotterdam. His research interests include organisational network dynamics within the military organisation and the governance of military innovations and digital transformation.

Stefan Soeparman

Stefan Soeparman is assistant professor in Public Administration and Organisational Sciences at the Faculty of Military Sciences, Netherlands Defence Academy. With a background in Public Administration, Public Information Management and Sociology, his research focuses on governance of technological and informational common pool resources, public sector informatisation, collaborative innovations within crisis response organisations and credible accountability.

Robbert Verhulst

Major Robbert Verhulst is a PhD student on Military Management and Organisation at the NLDA, with a background in military engineering, leadership and management and innovation. Combining a military career with an academic foundation, his research focuses on the socio-technical challenges of utilising generative potential in bureaucratic regimes in the context of digital transformation.

Bibliography

Alberts, D.S. and R.E. Hayes. *Power to the Edge: Command and Control in the Information Age.* Washington DC: CCRP Publication Series, 2003.

Baker, T., & R.E. Nelson. "Creating Something From Nothing: Resource Construction Through Entrepreneurial Bricolage." *Administrative Science Quarterly*, 50, no. 3 (2005): 329–366.

Bousquet, A. "Chaoplexic Warfare or the Future of Military Organization." *International Affairs* 84, no. 5 (2008): 915–929.

Bousquet, A. *The Scientific Way of Warfare. Order and Chaos on the Battlefields of Modernity*. London: Hurst & Company. New edition. 2022.

Cebrowski, A.K and J.J Garstka. "Network-Centric Warfare: Its Origin and Future." *Proceedings*. Vol 24, No1 (1998).

Chaves, K. "Learning on the Fly: Drones in the Russian-Ukrainian War." *Arms Control Today* 53, no. 1 (2023): 6-11.

Clausewitz, C. von, *On War*. London: Penguin Books, 1968.

Cunha, J.V., S. Clegg and M.P Cunha. "Structuring for Globalization: the Minimal Network." *FEUNL Working Paper*, No.536 (2009).

Emery, F. *Futures We're In*. Lismore: Southern Cross University Press, 1998.

Gall, C. "On the Front Line, Ukrainian Commanders Are Buoyed to Be on the Offensive." *New York Times*, August 20, 2023. https://www.nytimes.com/2023/08/20/world/europe/ukraine-counteroffensive-commandersfighters.html?action=click&module=RelatedLinks&pgtype=Article.

Hadida, A. L., W. Tarvainen and J. Rose. "Organizational Improvisation: A Consolidating Review and Framework." *International Journal of Management Reviews*, 17, no. 4, (2015): 437–459.

Hall, B. "Military Briefing: Ukraine's Battlefield Agility Pays Off." *Financial Times*, May 26, 2022. https://www.ft.com/content/9618df65-3551-4d52-ad79-494db908d53b.

Hunter, C and B. E. Bowen. "We'll Never Have a Model of an AI Major-General: Artificial Intelligence, Command Decisions, and Kitsch Visions of War." *Journal of Strategic Studies* (August 2023). DOI: 10.1080/01402390.2023.2241648.

Institute for the Study of War-01, "Russian Offensive Campaign Assessment." May 11, 2023. https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-may-11-2023.

Institute for the Study of War-02, "Russian Offensive Campaign Assessment." October 11, 2023. https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-october-11-2023.

Institute for the Study of War-03. "Russian Offensive Campaign Assessment." October 1, 2023. https://www.understandingwar.org/backgrounder/russian-offensive-campaign-assessment-october-1-2023.

Kalkman J.P. "Radical and Swift Adaptive Organizing in Response to Unexpected Events: Military Relief operations after Hurricane Dorian." *Academy of Management Discoveries* (March 27, 2023).

Kramer E.H. *Organizing Doubt: Grounded Theory, Army Units and Dealing with Dynamic Complexity*." Copenhagen: Copenhagen Business University Press. 2007.

Kramer, A. "Storming a Trench Is Treacherous Business. Here's How It's Done," *New York Times*, June 6, 2023. https://www.nytimes.com/2023/06/06/world/europe/ukraine-trench-warfare.html.

Kramer, E.H. and G. van Os. "Digitalisation, Organising and Organisational Choice: Exploring the Challenges of Digital Transformation Using Five Applied Sociotechnical Lenses." In *Towards a Data Driven Military*, edited by P. Pijpers, M. Voskuijl and R. Beeres, 23-50. Leiden: Leiden University Press, 2023.

Kramer, E. H., M. Moorkamp, and M. Visser, M. "Learning to Organize and Organizing to Learn: The Case of Dutch Military Expeditionary Task Forces." *The Learning Organization 28, no. 3, (2020): 270-282.*

Kramer, E.H. and M. Moorkamp. "Understanding Organizational Vulnerability in Military Taskforces." In *Organizing for Safety and Security in Military Organizations*. Edited by R. Beeres, G. Bakx, E.J. De Waard, and B. Rietjens, 21- 40. New York: Springer Verlag, 2016.

Kramer, E.H. and M. Moorkamp. "Reflective Practice in Synthetic Expeditionary Forces." In *Netherlands Annual Review of Military Studies, 97-114.* Berlin: TMC Asser Press, 2019.

Kuipers, H., P. Amelsvoort and E.H. Kramer. *New Ways of Organizing: Alternatives to Bureaucracy.* Leuven: Acco, 2020.

May, M. "The GIS Arta System Decides How to Attack the Enemy in Record Time, According to British Newspaper 'The Times' (The Uber-esque 'app' that Ukrainian Artillery Uses to Destroy Russian Battalions)." *Times Today,* May 26, 2022. https://todaytimeslive.com/world/46555.html.

Moorkamp, M. *Operating Under High Risk Conditions in Temporary Organizations: A Sociotechnical Perspective*. London: Routledge, 2019.

Patrickarakos, D. "The Madness Behind the Battle of Bakhmut." *UnHerd*, February 6, 2023. https://unherd.com/2023/02/the-madness-behind-the-battle-for-bakhmut/.

Santora, M. "A Brutal Path Forward, Village by Village Marc Santora." *New York Times,* September 9, 2023. https://www.nytimes.com/2023/09/02/world/europe/ukraine-russia-counteroffensive.html.

Simon, H. A. "The Architecture of Complexity." *Proceedings of the American Philosophical Society,* (1962): 467-482.

Sunduramurthy, C., C. Zheng, M. Musteen J. Francis and L. Rhyne. "Doing More with Less, Systematically? Bricolage and Ingenieuring in Successful Social Ventures." *Journal of World Business* 51, no. 5 (2016): 855-870.

Thompson, J.D. *Organizations in Action: Social Science Bases of Administrative Theory.* New Brunswick: Transaction Publishers, 2008.

Weick, K.E. *The Social Psychology of Organizing*. New York: McGraw-Hill. 1979.

Weick, K.E. *Sensemaking in Organizations*. London: Sage, 1996.

Weick, K.E. *Making Sense of the Organization.* Malden, MA: Blackwell Business. 2001.