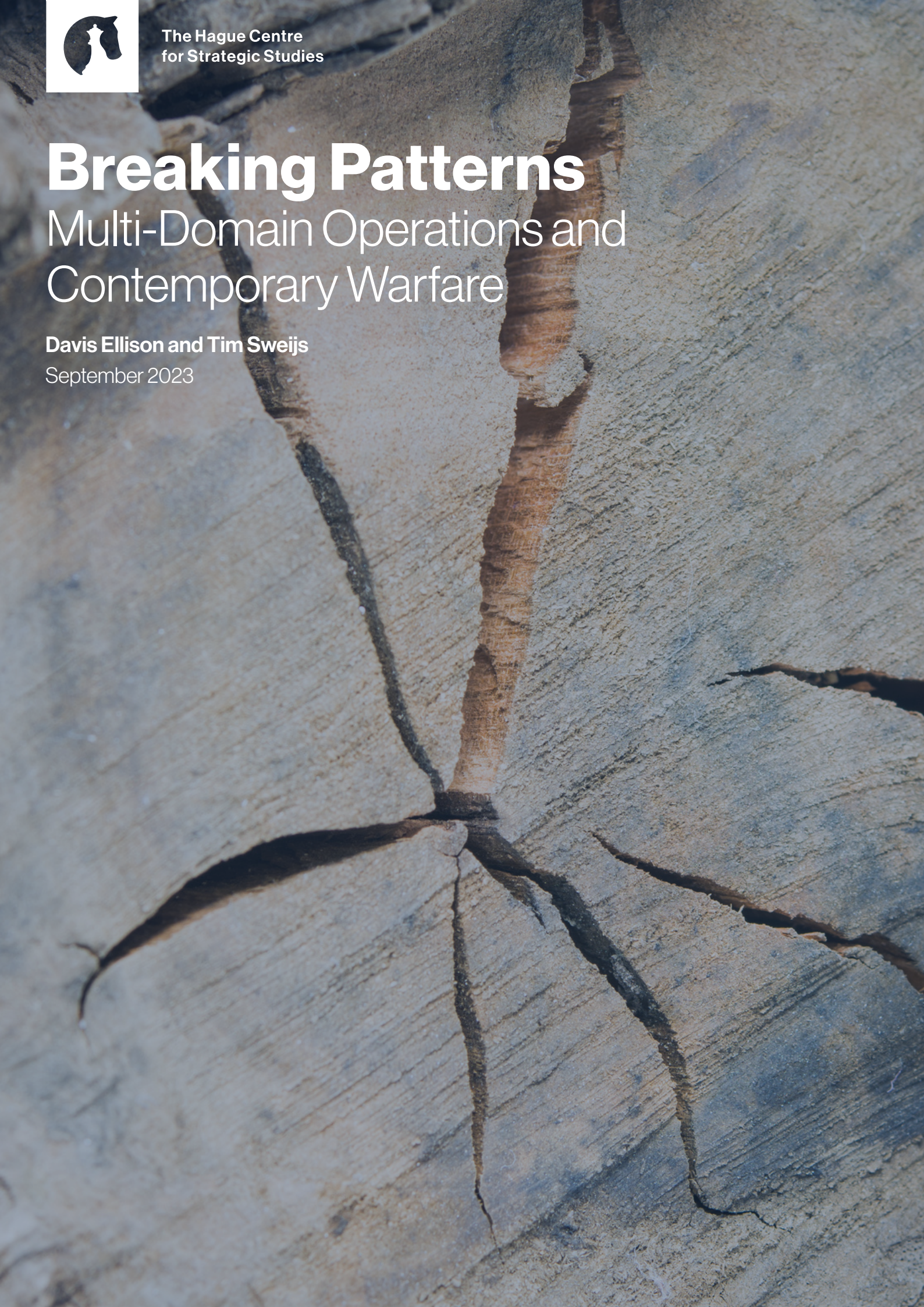

The Hague Centre
for Strategic Studies

Breaking Patterns

Multi-Domain Operations and Contemporary Warfare

Davis Ellison and Tim Sweijs

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Executive Summary

Introduction

Warfighting concepts shape our views on past, present and future wars. They contain an implicit criticism of past approaches, while offering proposals to avoid earlier mistakes and/or to address current challenges. Flexible Response, AirLand Battle, counter-insurgency (COIN), and hybrid war have all played these roles. Each spoke to a particular problem that the armed forces perceived they were facing at that moment in time. Today this is taking the form of multi-domain operations (MDO).

MDO is the dominant intellectual concept within NATO and other technologically advanced militaries.

MDO is *the* dominant intellectual concept within NATO and other technologically advanced militaries. Originally conceptualised as a counter to Russian and Chinese anti-access/area-denial approaches , MDO aims to combine and coordinate effects from across military and sometimes non-military actions. Different militaries stress the need to act more synergistically across military services and to better coordinate with civilian authorities. They highlight how sensors, communication technologies, and deep fires augur in a purportedly new way of warfighting but typically fail to articulate the mechanisms that could lead to the defeat of the opponent. For land forces in particular, there is a shift towards larger formations and the (re-) integration of capabilities not included in the expeditionary focused models of the post-Cold War era, such as long-range precision fires and extended air defence. As NATO transitions to its New Force Model, which calls upon NATO allies to provide a much larger pool of high-readiness forces, European small and middle powers in particular need to rationalise current approaches with new ambitions. MDO could offer a pathway towards reconciling these new ambitions with present realities.

Yet, the sole and only litmus test of any warfighting concept, including MDO, is whether it can deliver military success, defined as whether or not the use of military force achieves its associated political ends. This study examines whether and how the adoption of MDO concepts can help armed forces achieve military success.

The report argues that MDO has the opportunity to break away from the worst patterns of past conceptual work, though this will require concerted changes in prevailing approaches. As such, this study provides an intellectual framework as well as a set of guidelines that strategists and force developers can use to better assess and qualify MDO-type approaches across different countries, and, importantly, how such concepts can best be further developed.

Research method and framework

The study critically assesses MDO's promise as a warfighting concept through an examination of favouring factors for the successful adoption and implementation of MDO, based on a historical review of Western warfighting concepts over the past fifty years complemented with insights from the military innovation literature, interviews with defence planners and experts, and field visits. The framework comprises the following six factors: (1) clarity of language, (2) regime fit, (3) technological maturity, (4) threat specificity, (5) theory of success, and (6) risk consideration. These factors are further elaborated in Table 1 below.

Table 1. Factors favouring adoption and implementation of warfighting concepts

Factor	Description	Components
Clarity of Language	Whether a concept uses sufficiently clear language and consistent ideas	Commonly understood language across allies, government, and services
Regime fit	Whether a concept fits in its overall national/multinational context	Due consideration of political-military, inter-service, and intra-service dynamics
Technological Maturity	Whether a concept centres on mature or nascent technologies	Identification of specific systems that have been either been fielded or are only under development
Threat Specificity	Whether a concept clearly details a threat to which it is responding	A clearly named state or non-state threat and a specific description of how its military poses a threat
Theory of Success	Whether a concept has a clear argument as to how it will cause the outcome it intends to have	A causal argument that: 1) identifies a particular problem, 2) poses a theory of how to solve that specific problem, 3) links ways and means to argue how that theory will cause the problem to be solved, 4) considers the risks carried with pursuing the particular theory
Risk consideration	Whether a concept explicitly acknowledges the risks that its implementation carries	Commanders may be overloaded; over-rely on connectivity; over-engineer solutions; and coordination efforts may not be greater than the sum of its parts

The framework is applied to the state of MDO development in Denmark, France, Germany, Israel, NATO, Taiwan, the UK, and the US. These cases were selected in the context of the present study's applicability to the Dutch land force's development, but we believe the lessons that we identify have a wider application to the armed forces of small and middle powers as well as great powers.

The cases were examined using a list of standardised questions which shed light on the state of MDO development and allowed to assess the case studies on the framework of favouring conditions. The standardised questions were first researched through extensive desk research of official documents and reviews in professional periodicals. The results of the research were then checked and refined over the course of 2023 in country visits to the United States, Germany, Israel, and the Netherlands. Remote interviews were conducted with national experts from Denmark and France. Specific institutions visited were the US Headquarters of the Department of the Army, the US National Defense University, and the RAND Corporation in Washington, D.C., the German Army Headquarters in Straußberg, the Israeli Defense Forces' Dado Center for Interdisciplinary Military Studies, the Begin-Sadat Center for Strategic Studies, and the Institute for National Security Studies in Tel Aviv, and NATO's Command and Control Centre of Excellence in Utrecht. Due to time and project restrictions, researchers were unable to travel directly to Taiwan but were able to draw from a significant amount of desk research and previous HCSS work.

Conclusions

The overarching conclusion of this report is that, across cases, MDO risks remaining a fashionable idea that is not implemented at scale. While some efforts at force transformation and capability development have been initiated, it has not been made sufficiently clear how these concepts will lead to success in a contemporary conflict. The why and how of MDO simply does not have clear or entirely convincing arguments. This is not to say it is impossible to improve going forward, however the current trajectory is risking the worst patterns of post-revolution in military affairs (RMA) concept development work. To take serious steps forward, the following challenges need to be addressed by current work.

Babylonian confusion

Arguably, most national efforts to develop MDO have only worsened the 'Babylonian confusion' of concepts and terms with multiple interpretations. This is a natural byproduct of these efforts. Each new concept introduces new terms and as it is implemented its ideas and language are interpreted differently across services and different levels of the armed forces. As seen in the five-decade evolution of warfighting concepts, this has been prevalent for some time. NATO can be singled out and commended for its efforts to develop an alliance-wide approach to MDO, which can act as a common reference for 31 (soon 32) countries. A real risk however is that national approaches contradict what is agreed in NATO. The core finding then, is that greater alignment is needed and continued effort to achieve it will be vital for conceptual clarity into the future.

Regime fit

The challenge of whether MDO concepts are sufficiently fit for their respective political-military structures. Most concepts take adequate care to fit within a given structure, though the UK stands out in this regard and its multi-domain integration concept has received pushback from both the Foreign, Commonwealth, and Development Office and Parliament. Inter-service rivalry, particularly between air and land forces, is a perennial problem for MDO. The strongest case has been in the US, wherein the Army and Air Force have developed competing approaches over the years and the Navy and Marine Corps have divested themselves from this rivalry. Other states, namely Israel, face a different issue in which rivalry occurs between different branches of the ground forces, in this case the airborne and armoured corps. Finally, most MDO concepts have considered the role of the right echelon for MDO command and control, though there are not common answers. They range from the battalion (Denmark) to the theatre levels (US). Some land forces have identified the division or the corps level as the right place for MDO coordination to occur (France, Germany, Israel, UK). The main finding here is that MDO concepts must address regime fit head on, and explicitly address political-military and inter-service dynamics. Within services, assigning the right echelon is of equal importance.

Technology maturity

Almost universally, MDO concepts are not very realistic about the maturity of the technology upon which they are based, as nearly all cases assume a high level of assured communications connectivity which does not yet exist. The German and US cases are investing heavily into this connectivity, however there is a risk of becoming overly reliant on assured communications in the event of a conflict. Other areas, such as sensing and long-range strike systems, are much more mature and provide for a sound technological element in concepts, which feature prominently in the Israeli, Taiwanese, and US cases. Most importantly, new technologies should not be considered a panacea that can rectify a lack of mass on the battlefield, particularly as shortfalls continue amongst European states. For the Netherlands, this is especially true as its latest Defence Planning Capability Review for NATO noted that its heavy and medium brigades lack sufficiently manned battalions. The core finding here is that MDO concepts are highly reliant on immature command, control, communications, and intelligence (C3I) capabilities, though do have a firmer grounding in existing long-range strike and intelligence, surveillance, and reconnaissance (ISR) systems.

Threat specificity

Most MDO concepts included in this study are not sufficiently threat specific, most likely due to both security restrictions or wanting to ensure flexibility across global interests. Taiwan and Israel are the clearest, which is not surprising given their respective security environments and histories. Most others make general reference to 'peer-state actors', or do make direct reference to Russia or China, but do not take the extra step to explicitly identify how those states' armed forces pose threats to the current way of warfighting. The core finding is that threat descriptions must be specific and detailed to the actual attributes of an opponent's armed forces.

Theory of success and defeat mechanisms

Five of the eight cases included here only have implicit theories of success at best, with some being less opaque than others. France has a clear aim to disintegrate the armed forces of its opponents by preventing their various units from being able to coordinate. Both Taiwan and Israel have the clearest theories with explicit mechanisms, both effectively being the pre-emptive and rapid destruction of enemy forces before they can cohere and strike, an understandable approach given their inability to trade any space for time. Those cases with only implicit theories (Denmark, Germany, NATO, the UK, and the US) risk being overly vague in their specific applications, which in turn can limit their overall impact on future force designs or broader developments in doctrine, organisation, and procurement. The core finding here is a theory of success, or a causal argument as to why a new concept will actually lead to a desired result, is central to development efforts. The aim of the theory is to be testable in exercises, wargames, and experimentation.

Risk mitigation

Finally, based on the open sources and field work conducted in the context of this study, MDO concepts do not adequately take stock of the risks their implementation would carry. Each case makes optimistic arguments as to how the respective concept can function, though the trade-offs apparent in each remain hidden. It is quite likely that this clarity on risk remains covered under layers of classification, however openness about this risk is ultimately vital for inter-service communication, multinational planning, and even for legislative awareness. The core finding in this is that new warfighting concepts must be up front with their consumers what choices and trade-offs have been made in their development. To do otherwise risks either faulty implementation or unwarranted overconfidence.

Table 2. Risks associated with the implementation of MDO

Risk	Description	Impact
Overloading commanders	Commanders become overwhelmed by the need to coordinate too many tasks not within their normal span of control	Significant; overload risks paralysed command decisions and poor inter-government relations
Over-reliance on connectivity	Armed forces over-rely on assured connectivity when planning for and engaging in combat	Significant; the possibility that adversaries or battlefield friction can disrupt communications is a serious risk
Over-engineered, staff-heavy approach	Headquarters are too large to effectively manage and process replaces output	Significant; Western militaries have large, top-heavy staff systems that often enforce process over actual success
Over-promising	That MDO will combine domain actions to have greater impact than service-specific actions	Moderate; there is risk that MDO cannot deliver upon its promises, but this remains to be effectively tested

Recommendations

What does all of this mean for states, particularly for small and middle powers, that are either in the nascent stages of MDO concept development or are considering embarking on such an effort? The following recommendations move from the general to the specific, and offer steps that can be taken amongst ministries and armed forces' staffs in the short- to medium-term:

1. NATO states' concepts are not sufficiently specific about threats or are limited to specific scenarios

1.1. In MDO 'sub-concepts' articulate a clear threat definition that includes how a specific opponent's armed forces pose specific problems

1.2. Resist the temptation to only focus on Russia in overarching concepts (or any single state-based threat), but connect to sub-concepts

2. Theories of success are only marginally thought through by army planners and defeat mechanisms are opaque

2.1. Task strategists to develop theories of success with clear defeat mechanisms for a range of conflict scenarios

2.2. Create wargames, simulations, and exercises at national and international level which incorporate a feedback loop

3. There is a need for greater alignment within NATO and within allies' land forces on terms and core ideas

3.1. Continue to align efforts through NATO processes and procedures and incorporate into national efforts

4. Concepts are not sufficiently digestible at the political-military and inter-service levels or within army structures

4.1. Task concept developers to explicitly include references to political control of the use of force in warfighting concepts

4.2. Task concept developers to utilise joint efforts and make direct reference to other service concepts where applicable (e.g., on definitions and threat descriptions)

4.3. Task concept developers to study in-depth the correct land force echelon to coordinate MDO efforts, with a special focus on the Division and Corps levels

5. Concepts are overly-reliant on immature technology that does not yet exist within most allied land forces

5.1. Create roadmaps for technology maturity, with direct links to force mixtures and cost estimates

5.2. Recognise both capability (is the technology mature?) and capacity (how much can we get of it at reasonable cost?)

5.3. Wargame technology mixes in different scenarios (near peer, non-peer; low bandwidth / high bandwidth)

6. Concepts are not sufficiently transparent about the four risks carried within them

6.1. Insert mitigation strategies to the four risks in Table 2; if unavoidable, be clear that it is inherent to following the concept

7. Evolution of MDO continues, but there are doubts about the concept's durability in the US

7.1. Be wary about connecting too directly with legacy US conceptual development efforts

7.2. Strengthen awareness and understanding of US concept development and intra-service struggles

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Abbreviations

A2/AD	Anti-Access/Area-Denial
AJP	Allied Joint Publication
ATACMS	Army Tactical Missile System ('Tomahawk')
C2	Command and Control
C3I	Command, Control, Communications, and Intelligence
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
COIN	Counter-insurgency
CONOPS	Concept of Operations
DCDC	UK Ministry of Defence Development, Concepts and Doctrine Centre
DDA	Concept for the Deterrence and Defence of the Euro-Atlantic Area
EBO	Effects-Based Operations
FCDO	UK Foreign, Commonwealth, and Development Office
HIMARS	High Mobility Artillery Rocket System
IAMD	Integrated Air and Missile Defence
IDF	Israeli Defense Forces
IoPC	Integrated Operating Concept
ISR	Intelligence, Surveillance, and Reconnaissance
JADC2	Joint, All-Domain Command and Control
JFCOM	Joint Force Command
OODA	Observe, Orient, Decide, Act
M2MC	Multimilieux/Multichamps
MDO	Multi-Domain Operations
MDI	Multi-Domain Integration
MDTF	Multi-Domain Task Force
MIOP	Military Instrument of Power
NATO	North Atlantic Treaty Organisation
NCW	Network Centric Warfare
NWCC	NATO Warfighting Capstone Concept
PME	Professional Military Education
RMA	Revolution in Military Affairs
SRBM	Short-Range Ballistic Missile
TRADOC	US Army Training and Doctrine Command

1. Introduction

Warfighting concepts shape our views on past, present and future wars. They contain an implicit criticism of past approaches, articulate remedies for current problems, and offer proposals to avoid the mistakes of the past and/or address the challenges of today. Flexible Response, AirLand Battle, counter-insurgency (COIN), and 'hybrid war' have all played these roles in the past. Each spoke to a particular problem set that the armed forces perceived they were facing at that moment in time. Today this is taking the form of multi-domain operations (MDO). MDO has the opportunity to break away from the worst patterns of past conceptual work, though as this report will show, this will require concerted changes in prevailing approaches to do so.

MDO is *the* dominant intellectual concept within NATO and other technologically advanced militaries. Though not always explicitly titled multi-domain operations, the concept has taken on certain identifiable features. The working definition of MDO for this report is a warfighting concept that aims to combine and coordinate effects from across military and sometimes non-military actions. While broad, this definition is sufficiently elastic to consider a range of possible national and multinational approaches. Different militaries, while referring to the 'multi-domain' threat from states like Russia and China, stress the need to act more synergistically across military services and to better coordinate with civilian authorities. They highlight how sensors, communication technologies, and deep fires, augur in a purportedly new way of warfighting but typically fail to articulate the mechanisms that could lead to the defeat of the opponent. The US, UK, France, Germany, Israel, Taiwan, and NATO itself have all developed MDO concepts, as have China and Russia.

For land forces in particular, there is a shift towards larger formations and the (re-) integration of capabilities not included in the expeditionary focused models of the post-Cold War era, such as (long-range precision) fires and (extended) air defence.[1] As NATO transitions to its New Force Model, which calls upon NATO allies to provide a much larger pool of high-readiness forces, European small and middle powers in particular need to rationalise current approaches with new ambitions. MDO could offer a pathway towards reconciling these new ambitions with present realities.

In this context, it should be noted that the sole and only litmus proof of any warfighting concept, including MDO, is whether it can deliver military success, defined as whether or not the use of military force achieves its associated political ends. This study examines whether and how the adoption of MDO concepts can help armed forces achieve military success.

The study critically assesses MDOs' promise as a warfighting concept through an examination of the favouring conditions for successful adoption and implementation. Importantly, it endeavours to support building shared understanding across services, government departments, and allies of what makes up MDO, and how such a concept can best be further developed.

1 Anthony King, *Command: The Twenty-First Century General* (Cambridge, UK: Cambridge University Press, 2019).

This study takes on these issues based on eight case studies (Denmark, France, Germany, Israel, NATO, Taiwan, UK, US). As such, it provides an intellectual framework that strategists, force developers, and the strategic studies field more broadly can use to better assess and qualify MDO-type approaches across different countries. It begins by exploring what a warfighting concept actually is and identifies those factors that can lead to a concept's success based on a historical review of Western warfighting concepts over the past fifty years complemented with insights from the military innovation literature. It reflects on the importance of a theory of success and defeat mechanisms in warfighting concepts. On this basis it develops the analytical framework to assess and classify the various types of MDO approaches that have been in development. Finally, it uses these cases to derive key insights for European land forces that are in the process of adopting and implementing MDO concepts themselves, and offers recommendations going forward.

2. A Word on Method

This study presents an analytical framework of conditions that favour the successful adoption and implementation of warfighting concepts based on a concise historical overview of major concept development efforts over the past five decades, beginning with the adaptations of the US Army following Vietnam. While informed by older developments such as the emergence of Combined Arms Warfare during the First World War, it begins here as this period not only germinated the string of intellectual development that led to MDO, but also saw the creation of internal military entities whose entire purpose is the development of new warfighting concepts. The evolution described in this historical survey provided the basis for the analysis of this report. The six factors identified form the analytical framework, taking those elements from historical cases that contributed to failure, and inverting them to identify favouring factors for ongoing and future development.

The framework is applied to the state of MDO development in Denmark, France, Germany, Israel, NATO, Taiwan, the UK, and the US. These cases were selected in the context of the present study's applicability to the Dutch land force's development, as well as other small and middle power armies. For this reason, Denmark was chosen as another highly developed small power within NATO, while France, Germany, NATO, the UK, and the US were selected given both their importance in developing MDO thinking as well as their centrality for Dutch and other small and middle powers interoperability. Germany is particularly important given the Dutch Army's present integration into the German Army. Israel and Taiwan were selected both because they are small and middle powers as well because of their innovative approaches to MDO. The cases here are not exact like-cases, as some are joint military concepts (Denmark, France, Germany, Taiwan, the UK), some are army-specific (Israel, the US), and NATO is not a state-based case, but nonetheless functions as a standalone case given the independent development of MDO by the NATO command and force structures. Each offers the opportunity to explore and examine the insights from each case's experience.

These cases were then examined using a structured focused comparison framework consisting of a list of standardised questions (included in Textbox 1 below) which shed light on the state of MDO development and allowed the research team to assess the case studies on the framework of favouring conditions. The standardised questions were first researched through extensive desk research of official documents and reviews in professional periodicals. The results of the research were then checked and refined over the course of 2023 in country visits to the United States, Germany, Israel, and the Netherlands. Remote interviews were conducted with national experts from Denmark and France. Specific institutions visited were the US Headquarters of the Department of the Army, the US National Defense University, and the RAND Corporation in Washington, D.C., the German Army Headquarters in Straußberg, the Israeli Defense Forces' Dado Center for Interdisciplinary Military Studies, the Begin-Sadat Center for Strategic Studies, and the Institute for National Security Studies in Tel Aviv, and NATO's Command and Control Centre of Excellence in Utrecht. Due to time and project restrictions, researchers were unable to travel directly to Taiwan but were able to draw from a significant amount of desk research and previous HCSS work.

Case study questionnaire

1. **Is there unity of understanding across military services and/or the government of MDO?**
    a. Were all of the armed forces involved in the development of the concept?
    b. Is language consistent across service concepts?
    c. Is there an overarching strategy the concept answers to?
    c. Is there a 'coordinating office' for MDO?

2. **What is the technological maturity of the capabilities identified in the concept?**
    a. Is there is a dedicated MDO-focused investment programme?
    b. Is MDO driving capability investment decisions?
    c. What are the key investments needed to enable MDO?
    d. Where are investments prioritised across DOTMLPFI (doctrine, organisation, technology, materiel, leadership, personnel, facilities, interoperability)

3. **What is the regime fit especially with respect to command and control (C2) arrangements?**
    a. Is the existing C2 structure of the armed forces (both individually and when integrated into multinational structures) fit for purpose to command and coordinate such an approach?
    b. How does the concept envision interacting with non-military actors?
    c. At what level is MDO envisioned to operate? (i.e. Corps, Division, Brigade, 'joint force', etc.)

4. **Does the concept elucidate a theory of success and defeat mechanisms?**
    a. Is there a clearly identified threat? Does it move beyond identifying an adversary?
    b. How does the approach actually envision itself as a theory of success?
    c. What is the nature of the threat the concept is answering to? Does it articulate defeat mechanisms?
    d. How did the land forces contribute to the development of the concept? Is there as specific concept for them?

3. Warfighting concepts: evolution, failing factors, favouring conditions

Warfighting concepts provide an approach to a potential military problem and articulate a working hypothesis for solving that problem.

To accurately compare like-cases and to effectively develop useful insights, it is important to lay out what this study means when it refers to a 'warfighting concept'. This study is not focused on either higher-level concepts such as NATO's Strategic Concept or lower-level concepts of operations (CONOPs), but specifically on those efforts to a new 'way of war' that can guide decisions across DOTMLPF-I (doctrine, organisation, technology, materiel, leadership, personnel, facilities, and interoperability) development.

For the purposes of this study, a warfighting concept is a description in general terms of the application of military art and science within a defined set of parameters. Warfighting concepts provide an approach to a potential military problem and articulate a working hypothesis for solving that problem. They provide a framework for how a military force intends to conduct warfare and achieve its objectives by outlining the principles, tactics, strategies, and operational methods that guide the military in preparing for and executing various types of military operations. This definition is deliberately broad to accommodate the variety of linguistic and military-cultural backgrounds contained within the cases used here. The following section discusses historical cases based on this understanding of military conceptual work.

3.1. Five decades of warfighting conceptual evolution

Why are some concepts successfully adopted and implemented while other concepts fail and are discarded? Are concepts discarded entirely, or do their main ideas linger on in institutional memories only to be repackaged at a later date? There are seemingly two primary ways a concept is invalidated, either actual failure on the battlefield or a significant shift in the security environment that causes a crisis amongst planners who now fear their approach is doomed to battlefield failure. A decisive loss on the battlefield, or being stuck in a quagmire, leads to intense institutional pressure to discard a concept as blame is assigned. Entrenched institutional memory plays a role as well, as failures become a heuristic for what not to do, even if not necessarily historically substantiated.[2] Opposition to static defences (e.g., the Maginot

2 David Betz, "Citadels and Marching Forts: How Non-Technological Drivers Are Pointing Future Warfare Towards Techniques from the Past," *Scandinavian Journal of Military Studies* 2, no. 1 (2019): 30–41.

line, and the Bar-Lev line) but also the feasibility of counterinsurgency after Vietnam are clear examples of this dynamic in practice.[3] Military failure creates a significant evolutionary pressure to evolve conceptual approaches. Clearly, something has gone wrong in the national or multi-national way of war and core operating assumptions are being revisited. This occurs both from a functional perspective (i.e., how can our armed forces be more successful?) and an institutional perspective (i.e., how can we ensure our forces are not put into a similar situation by our leadership?). In the five decades covered below military institutions engaged in a near-constant push and pull to adapt to changing security circumstances and seeking to avoid repeating the mistakes of the past. We will briefly consider the US and Israeli cases here, as the armed forces of these two countries have been engaged in various wars over the years and have a substantial dedicated infrastructure to learn from their experiences.

3.1.1. Moving on from Vietnam and Yom Kippur

The post-Vietnam adaptation of the U.S. Army is an indicative case here, one that is particularly relevant for the evolution of military thinking into what would become MDO. Described by Peter Mansoor, "In the post-Vietnam period, army leaders not only relegated counterinsurgency doctrine to the ash heap of history but also adjusted the force structure to eliminate the types of capabilities needed to pursue such operations."[4] This adjustment would come under particular scrutiny at the beginning of the 21st century, however at the time it acted as a catalyst for a new generation of military-strategic thought.

As the U.S. Army eschewed counterinsurgency and put Vietnam into the past, it refocused its conceptual efforts in the European theatre and in countering Soviet and Warsaw Pact conventional force advantages. Importantly, this adaptation by the U.S. Army also drew heavily from the experiences of the Israel Defense Forces (IDF) in the October War of 1973. The heavy losses experienced by the IDF following the surprise attack by a coalition of Arab states largely armed and trained by Warsaw Pact states led to comparisons of NATO's conventional posture in Central Europe.[5] This led to the doctrine of active defence, which then quickly evolved into AirLand Battle, which featured methods and capabilities (such as newly developed precision strike weapons) designed to defeat both the first and follow-on echelons of Red Army armoured forces.[6]

AirLand Battle would become enshrined in NATO doctrine by 1986.[7] Central to this new approach was a new generation of conventional weapons and a proliferation and enhancement of digitised command and control (C2) systems, a collective development that formed the basis of what would be termed the 'revolution in military affairs' (RMA).[8] The AirLand battle concept was an important driver of these new capabilities Additionally, the concept revived the Corps-level echelon as the principle fighting formation that could achieve sufficient mass, effectively distribute airpower, coordinate theatre-level logistics, and coordinate campaign

3 Stephen Biddle, "Strategy in War," *PS: Political Science and Politics* 40, no. 3 (2007): 461–66; Paul B. Seguin, "The Strategic Performance of Defensive Barriers" (Fort Belvoir, VA: US Army Engineer Studies Center, 1988), https://apps.dtic.mil/sti/pdfs/ADA197303.pdf; Peter R. Mansoor and Williamson Murray, *The Culture of Military Organizations* (Cambridge, UK: Cambridge University Press, 2019).

4 Mansoor and Murray, *The Culture of Military Organizations*, 301.

5 Mansoor and Murray, 302–3.

6 Mansoor and Murray, 303.

7 "Deep Battle: Showing How Its Done," *Field Artillery Journal*, February 1986, 22–23.

8 Michael E. O'Hanlon, *The Science of War: Defense Budgeting, Military Technology, Logistics, and Combat Outcomes* (Princeton, NJ: Princeton University Press, 2009), 171–87.

objectives at scale.[9] Importantly, the AirLand battle concept supported itself with a simple logic that argued that new weapons in larger formations, which were already being fielded and therefore both sufficiently mature and present in sufficiently large numbers, would offset Soviet conventional advantages by striking rear-area military targets (e.g. field headquarters, supply lines, depots) to disrupt the Warsaw Pact's ability to sustain a longer fight in the central European region.[10] It was stated in clear terms, was solely developed within the context of a single threat, the Warsaw Pact, and a testable theory of success which formed the basis for experimentation and exercises.[11]

Israel is another useful example of the evolution of warfighting concepts. Israeli lessons from the 1973 war focused at two levels: the political-military and the military-operational. The political-military level, the primary focus of the 1974 Agranat Commission which was established to identify these lessons, found serious failings in the state's intelligence apparatus as well as command authorities between the elected government and military officers.[12] More importantly was the military-operational debates surrounding the 'war of the generals' before, during, and after the war as various combined arms branches (namely the armoured and paratrooper corps) faced off regarding the most effective warfighting concept for the IDF.[13] Israel's security environment shifted significantly in the following years as the Camp David accords were negotiated, ending decades of conflict with its largest neighbour Egypt. Israel maintained its large, reserve-centric force following 1973 and has continued to do so since, with a persistent effort to ensure adequate capabilities and capacities to counter a resurgent state-based threat such as Iran.[14] However, the Agranat Commission succinctly revealed a tension, which touch directly on the likelihood that warfighting concepts are not only adopted but also implemented: the role of the political-military and inter-service and intra-service interfaces.

The supposed RMA received considerable credit for delivering success in both the U.S. invasion of Panama in 1989 and the 1991 Gulf War.[15] Scepticism grew over time, however, that the precision effects of new systems like the Hellfire and Army Tactical Missile System were what had delivered such lopsided victories. Stephen Biddle argued that it was less new weapons systems but rather a strong focus within U.S. forces for getting the 'modern system' (e.g. small unit independent manoeuvre, combined arms, differential concentration, and operational depth) right, while Saddam Hussein's Iraqi Army did not, had much more do with the Coalition's success in 1991.[16] In this case, the modern system had been largely established by the end of the First World War, hampering the argument that the technological development of the late 1980s had played a decisive role. Caitlin Talmadge would argue later that the operational deficiencies seen by the Iraqi army, among others, was largely a result of it being a 'dictator's army' with endemic corruption, poor information sharing, and a weak training regime. Success

9 Douglas W. Skinner, "AirLand Battle Doctrine," Professional Paper (Arlington, VA: Center for Naval Analyses, September 1988), 12, https://apps.dtic.mil/sti/pdfs/ADA202888.pdf.

10 Hugo Wass de Czege, "Commentary on 'The US Army in Multi-Domain Operations 2028'" (Carlisle Barracks, PA: US Army War College, April 2020), https://press.armywarcollege.edu/monographs/909/.

11 Edward C. Keefer, *Harold Brown: Offsetting the Soviet Military Challenge, 1977-1981*, Secretaries of Defense Historical Series (Washington, D.C.: Office of the Secretary of Defense Historical Office, 2017).

12 Lawrence Freedman, *Command: The Politics of Military Operations from Korea to Ukraine* (Oxford, New York: Oxford University Press, 2022); Efraim Inbar, "Israeli Strategic Thinking after 1973," *Journal of Strategic Studies* 6, no. 1 (March 1983): 36–59, https://doi.org/10.1080/01402398308437140.

13 Zaki Shalom, "The 'War of the Generals' after the Yom Kippur War," *Strategic Assessment* 24, no. 3 (2021).

14 Joseph Krasna, "Israel's National Security since the Yom Kippur War," *Foreign Policy Research Institute* (blog), October 25, 2017, https://www.fpri.org/article/2017/10/israels-national-security-since-yom-kippur-war/.

15 Mansoor and Murray, *The Culture of Military Organizations*, 306–7; Eliot A. Cohen, "A Revolution in Warfare," *Foreign Affairs* 75, no. 2 (1996): 37–54, https://doi.org/10.2307/20047487.

16 Stephen Biddle, *Military Power: Explaining Victory and Defeat in Modern Battle* (Princeton University Press, 2004), 2–4, https://doi.org/10.2307/j.ctt7s19h.

on the battlefield then is less defined by weapons systems but rather by elements such as promotion patterns for officers, command arrangements, and information management.[17]

Nevertheless, the RMA and its attendant post-Cold War concepts of 'full-spectrum dominance', 'network-centric warfare', and 'effects-based operations' took hold in U.S., Israeli, and European military thinking. The first wave was predominantly led by post-Vietnam airpower theorists who stressed the revolutionary potential of precision guided munitions.[18] This trend went so far as to be institutionalised in the U.S. Office of the Secretary of Defense's Command and Control Research Program (now an external organisation called the International Command and Control Institute).[19] The active study and development of new concepts became increasingly institutionalised through such programmes, efforts which expanded to other states such as the UK and other states on the European continent.[20] The proliferation of new concepts, supporting sub-concepts, and government-funded research underpinning such work led to the rapid increase of new terms and ideas within and between the armed services, ministries, and allied states. The stage was set for a new era of jargon-centric military confusion.

The proliferation of new concepts...led to the rapid increase of new terms and ideas within and between the armed services, ministries, and allied states.

Several consistent features emerge from the late-Cold War/post-Cold War era of military conceptual thinking. First is a technological focus on longer-range precision fires, which were seen as ideal for destroying hardened or mobile enemy forces without a significant ground commitment. Second is the notion of 'connectivity' enabled by the integration of modern computing into the military's daily life. Third is an emphasis on speed of decision and action, seen as necessary to rapidly achieve decisive effect and achieve war aims early, rather than being drawn into a prolonged conflict. The (military) successes of the Persian Gulf War and Kosovo intervention seemed to confirm these features as ideal. These three features informed the embracing of the RMA logic, particularly in the form of network-centric warfare (NCW) in the 1990s and into the early 2000s.

3.1.2. Failures of the RMA in the war on terror

The seeming success of the precision revolution embodied in NCW bred an over-confidence in these new systems that ran headlong into the maelstroms of twenty-first century warfare. Coalition forces in Afghanistan and Iraq, and Israel in Lebanon, were unable to deliver decisive military-strategic results in their respective counter-insurgency campaigns.

An early sign of the limits of a precision and data centric approach emerged during Operation Anaconda in Afghanistan in March 2002, early in the international campaign. Nine NATO allies (including the US, UK, France, and Germany who are covered in the annexes here) as well as Afghan and other partner forces sought to target Taliban and al-Qaeda forces hidden in the Shah-i-Kot valley in the east of the country. As described in detail by Biddle, "an intensive prebattle reconnaissance effort focused every available surveillance and target acquisition

17 Caitlin Talmadge, *The Dictator's Army: Battlefield Effectiveness in Authoritarian Regimes*, Cornell Studies in Security Affairs (Ithaca, NY: Cornell University Press, 2015).

18 Mansoor and Murray, *The Culture of Military Organizations*, 445–46.

19 "Command and Control Research Portal," Command and Control Research Portal, accessed July 5, 2023, https://internationalc2institute.org.

20 "Ministry of Defence | Fact Sheets | DCDC - Background," The National Archives, accessed July 10, 2023, https://webarchive.nationalarchives.gov.uk/ukgwa/20080205182025/http://www.mod.uk/DefenceInternet/FactSheets/DcdcBackground.htm; Yotam Feldman, "Dr. Naveh, Or, How I Learned to Stop Worrying and Walk Through Walls," *Haaretz*, October 25, 2007, https://www.haaretz.com/2007-10-25/ty-article/dr-naveh-or-how-i-learned-to-stop-worrying-and-walk-through-walls/0000017f-db53-df9c-a17f-ff5ba92c0000.

system on a tiny, 100 square kilometre battlefield." Despite this intensive intelligence effort and the operations of thousands of air, sea, and ground forces, Taliban and al-Qaeda forces were not dislodged by precision strikes, if their positions were discovered at all. Crucially, the allied effort suffered from poor coordination between air and land forces.[21] Though heavy losses were experienced by the insurgent forces, they were not enough to quickly resolve the operation. Operation Anaconda would ultimately take over two weeks to resolve. Again from Biddle, "the evidence does indicate that a combination of cover and concealment can allow defenders, though battered, to survive modern firepower in sufficient numbers to mount serious resistance."[22] Simple applications of the modern system of warfare were able to withstand weeks of targeting by some of the most advanced militaries.

Returning to Israel, the IDF had in the 1990s and early 2000s come to embrace U.S.-style thinking in 'effects based operations' (EBO), which placed a premium on using airpower to rapidly target and eliminate enemy forces in order to quickly resolve a conflict.[23] When the IDF launched an operation in 2006 to dislodge Hezbollah fighters from southern Lebanon, it put this new approach to the test. What IDF commanders ultimately faced, however, was a month-long ground campaign that ended in military stalemate as airpower was unable to adequately identify and neutralise well concealed Hezbollah fighters. Another government inquiry following the end of the conflict, the Winograd Commission, found that:

> *"the expectation by some members of the IDF's leadership that the nation's precision standoff capability could decide the outcome of the war without a major supporting ground action was "wrong." Additionally, there was an insufficient appreciation by the IDF leadership of the inherent limitations of precision standoff attacks against dispersed irregular forces."*[24]

The seeming failures of the early years of the war on terror became centred on criticisms of 'precision fetishism' that had grown within modern armed forces.[25] Then commander of US Joint Force Command (JFCOM) Jim Mattis, due both to the operational failure of the concept when employed by the Israeli Defense Forces in the 2006 Lebanon War and to what Mattis referred to as its 'fatal flaws', was a particularly vocal critic.[26] These flaws, an over-reliance on the 'mechanistic certainty' of precise information and overly-centralised command and control, led Mattis to effectively ban 'effects-based' style language from JFCOM products, and to later make the recommendation that JFCOM itself be shut down (which it was in 2011).[27] Quoting Mattis, "EBO played well on PowerPoint slides."[28] The optimism of the RMA had run headlong into the realities of modern combat and Clausewitz's passion, reason, and chance

21 Rebecca Grant, "Operation Anaconda: An Air Power Perspective" (Washington, D.C.: US Department of the Air Force, 2005), https://apps.dtic.mil/sti/citations/ADA495248.

22 Stephen Biddle, "Afghanistan and the Future of Warfare," *Foreign Affairs* 82, no. 2 (2003): 31–46, https://doi.org/10.2307/20033502.

23 Avi Korber, "The Israel Defense Forces in the Second Lebanon War: Why the Poor Performance?," *Strategic Studies* 31, no. 1 (2008), https://www.tandfonline.com/doi/full/10.1080/01402390701785211.

24 Benjamin S. Lambeth, *Air Operations in Israel's War Against Hezbollah: Learning from Lebanon and Getting It Right in Gaza* (Santa Monica, CA: RAND Corporation, 2011), 213; Martin van Creveld, "Israel's Lebanese War: A Preliminary Assessment," *The RUSI Journal* 151, no. 5 (October 1, 2006): 40–43, https://doi.org/10.1080/03071840608522872.

25 David Betz, *Carnage and Connectivity: Landmarks in the Decline of Conventional Military Power* (London: Hurst Publishers, 2015), 53–55.

26 James N. Mattis, "USJFCOM Commander's Guidance for Effects-Based Operations," *Parameters* 38, no. 3 (2008): 18–25.

27 Jim Mattis and Bing West, *Call Sign Chaos: Learning to Lead* (New York: Random House, 2019).

28 Mattis and West, 181.

could not be rationalised out of warfare.[29] Both the Winograd Commission and Mattis's criticisms of EBO highlighted the risk of doubling-down in concepts on technologies which can overpromise in peacetime yet underdeliver in wartime. Put simply, while NCW and EBO did leverage mature technology, it was never done with a poorly elucidated theory that mistook tactics for strategy, all while avoiding the risks inherent in over-relying on this new concept.

An overemphasis on kinetic action during the Iraq and Afghanistan campaigns led to a revival of counter-insurgency as a distinct concept (COIN) and what became known in NATO as the 'comprehensive approach' to operations. Both centred on 'population-centric' approaches to counter-insurgency that sought to coordinate actions across government functions (diplomatic, information, military, and development, economic) in order to address both the combat factors in countering insurgencies and their underlying causes. Two primary tensions arose, however. The first a civil-military issue, the second more practical. The former was simply that other ministries or departments often did not find it appropriate for the military to be the central coordinator of civilian actions as it runs counter to expectations about civilian control.[30] Secondly, it was highlighted that 'population-centric' concepts were undercut in practice by aggressive special operations and conventional campaigns that frequently caused civilian casualties.[31] It should be noted that the comprehensive approach style of planning has not left the stage entirely however, with its core ideas becoming enmeshed with today's MDO concepts.

The period 2014-2015 became a collective intellectual crisis for many armed forces.

Where RMA-era concepts' optimism was most warranted was when adversaries presented a more 'conventional' target, i.e. out in the open. The early stages of the invasion of Afghanistan in autumn 2001, the initial stages of the 2003 Coalition invasion of Iraq, NATO's 2011 intervention in Libya, and international efforts against the Islamic State in Iraq and Syria beginning in 2014 all demonstrated the continued effectiveness that long-range precision fires and battlefield 'digitalisation' could have enemy targets out in the open. Crucially, however, each of these campaigns did not rely on these elements alone. Each featured significant ground manoeuvre elements either by international or local forces to take and consolidate ground in highly contested urban areas. Also, each would later devolve either into bloody insurgencies, civil wars, or prolonged attrition campaigns in urban areas where precision fires were much less effective, evidence that such systems may be decisive in some instances but not sufficient in and of themselves.

3.1.3. **The post-2014 renaissance of the RMA**

The period 2014-2015 became a collective intellectual crisis for many armed forces. Russia's annexation of Crimea and the outbreak of war in eastern Ukraine shortly thereafter, the rise of ISIS in both Iraq and Syria and the resultant refugee crisis, and a marked increase in Chinese military activity in the South China Sea drew a significant amount of attention back to larger-scale military operations. For some in the armed forces, this refocusing was a welcome relief after years of deadlocked counterinsurgency in the Middle East[32], like the U.S. Army

29 Betz, *Carnage and Connectivity: Landmarks in the Decline of Conventional Military Power*, 55.

30 Sten Rynning, "Still Learning? NATO's Afghan Lessons beyond the Ukraine Crisis," in *NATO's Return to Europe: Engaging Ukraine, Russia, and Beyond,* Edited by Rebecca R. Moore and Damon Coletta (Washington, D.C.: Georgetown University Press, 2017); David D. Yost, *NATO's Balancing Act* (Washington, D.C.: United States Institute of Peace Press, 2014).

31 Carter Malkasian, *The American War in Afghanistan: A History* (Oxford: Oxford University Press, 2021); Theo Farrell, *Unwinnable: Britain's War in Afghanistan 2001-2014* (London: Vintage, 2017).

32 Micah Zenko, "America's Military Is Nostalgic for World Wars," *Foreign Policy* (blog), March 13, 2018, https://foreignpolicy.com/2018/03/13/americas-military-is-nostalgic-for-great-power-wars/.

after Vietnam. Developing concepts, it seemed, would become more intuitive with clear, state-based opponents.

A number of unfamiliar dynamics came back to the centre of strategists' thinking: the risk of nuclear escalation, operating under conditions of severe attrition, the tyranny of distance, and adversary armed forces that are capable of dealing significant damage in return. Suddenly, the heavily data dependent armed forces of NATO states began to seem more vulnerable in the face of adversary cyber and electronic warfare efforts.[33] Perhaps more significantly, major state adversaries like Russia and China saw the performance of precision strike on battle-fields around the world and made significant efforts to invest in these capabilities, as well as space, cyber, and electronic warfare capabilities to blunt the effectiveness of strike systems.

Both China and Russia had indeed been watching the performance of Western forces quite closely and adapting accordingly. New concepts such as China's 'systems confrontation warfare' and Russia's 'reconnaissance strike complexes' were developed to specifically target the perceived vulnerabilities in Western forces.[34] A particular fear began to develop amongst North American and European states of Russian and Chinese anti-access/area-denial (A2/AD) 'bubbles' that could seemingly prevent freedom of manoeuvre for military forces across all domains in areas of previously uncontested superiority. Studies quickly proliferated that foresaw NATO's Baltic allies being overrun within a matter of days and Taiwan suffering massive losses.[35]

That Russia and China have learned and applied lessons from NATO states' operations should not be surprising. The military-strategic 'ecosystem' in which these concepts develop generates an evolutionary pressure which pushed opponents' structures to try to keep pace.[36] Russian and Chinese concepts should be seen in the light of reaction to US and other NATO states' warfighting concepts. There has even been a measure of mirror-imaging, with the Russian idea of a 'reconnaissance-strike complex' closely resembling Western thinking on the use of precision fires across domains. The same can be said for China as well, with the systems destruction approach emphasising paralysis and disintegration through combining kinetic and non-kinetic strikes.

Here the story picks up again from the heady days of the RMA era, essentially becoming NCW 2.0. The roots of the first explicitly 'multi-domain' concepts appeared in 2015, with a speech by then US Deputy Secretary of Defense Robert Work at the US Army War College in the context of developing a new 'offset strategy' against Russia and China. He argued, "the real essence of the third offset strategy is to find multiple different attacks against opponents across all

33 Betz, *Carnage and Connectivity: Landmarks in the Decline of Conventional Military Power*, 71.

34 Jeffrey Engstrom, "Systems Confrontation and System Destruction Warfare: How the Chinese People's Liberation Army Seeks to Wage Modern Warfare" (RAND Corporation, February 1, 2018), https://www.rand.org/pubs/research_reports/RR1708.html; Oscar Jonsson, *The Russian Understanding of War: Blurring the Lines between War and Peace* (Washington, DC: Georgetown University Press, 2019).

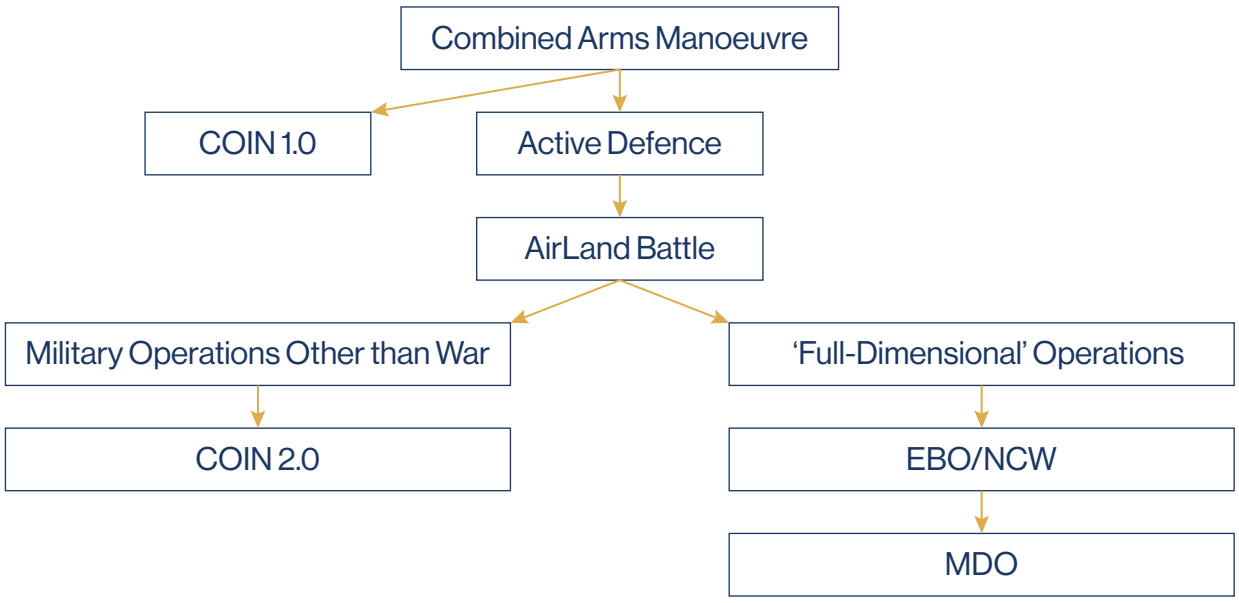
35 David A. Shlapak and Michael Johnson, "Reinforcing Deterrence on NATO's Eastern Flank: Wargaming the Defense of the Baltics" (RAND Corporation, January 29, 2016), https://www.rand.org/pubs/research_reports/RR1253.html; Mark F. Cancian, Matthew Cancian, and Eric Heginbotham, "The First Battle of the Next War: Wargaming a Chinese Invasion of Taiwan," CSIS International Security Program (Center for Strategic and International Studies: Washington, D.C., January 2023), https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/230109_Cancian_FirstBattle_NextWar.pdf?VersionId=WdEUwJYWIySMPIr3ivh-FolxC_gZQuSOQ; Roger Cliff, *China's Military Power: Assessing Current and Future Capabilities* (Cambridge, UK: Cambridge University Press, 2015).

36 Rafe Sagarin, *Learning From the Octopus: How Secrets from Nature Can Help Us Fight Terrorist Attacks, Natural Disasters, and Disease* (New York: Basic Books, 2012); David Kilcullen, *The Dragons and the Snakes: How the Rest Learned to Fight the West* (London: Hurst Publishers, 2020).

domains so they can't adapt..."[37] The US Army followed this push with the public release of 'multi-domain battle' in 2018. Described as an evolution directly from AirLand battle, it included emphases on 'system of systems, increased operational options, integration, and speed,' revisiting the main elements from past concepts.[38] From this initial conceptual period, armed services and ministries of defence began the collective, but often disjointed efforts to develop their own service-specific or national joint warfighting concepts.[39]

This period also became dominated by a focus on 'hybrid warfare'. Originally developed by Frank Hoffmann of the US National Defense University as a way to conceptualise the role of proxies in modern conflict,[40] it was later picked up by others who shaped it into a catch-all concept wherein nearly all diplomatic, economic, and military activity lies beyond the threshold of large scale violence.[41] It became a renewal of comprehensive approach-style thinking that emerged during the 2000s and 2010s, and remained equally difficult to develop a lucid theories of success around.

Figure 1. 'Family Tree' of Warfighting Concepts



37 Bob Work, "Army War College Strategy Conference," US Department of Defense, April 8, 2015, https://www.defense.gov/News/Speeches/Speech/Article/606661/army-war-college-strategy-conference/.

38 "Multi-Domain Battle" (Washington, D.C.: US Army Science Board, January 2018), https://asb.army.mil/Portals/105/Documents/2010s/2017%20A%20MDB%20Report.pdf?ver=bhWh5nT9fIwNANl0jW3w-GQ%3D%3D.

39 Kelly McCoy, "The Road to Multi-Domain Battle: An Origin Story," Modern War Institute, October 27, 2017, https://mwi.westpoint.edu/road-multi-domain-battle-origin-story/.

40 Frank G. Hoffman, "Conflict in the 21st Century: The Rise of Hybrid Wars" (Arlington, VA: Potomac Institute for Policy Studies, 2007), https://www.potomacinstitute.org/images/stories/publications/potomac_hybrid-war_0108.pdf.

41 Chiara Libiseller, "'Hybrid Warfare' as an Academic Fashion," *Journal of Strategic Studies* 0, no. 0 (2023): 1–23.

The above tracing of conceptual evolution, visualised in Figure 1 above, over the past five decades has shown how operational and strategic failures in wartime have fed evolutionary pressures for new conceptual thinking. New concepts frequently appear as faddish, transitory ideas that are absorbed into newer concepts as work continues.[42] This review has identified six major themes: the importance of straightforward language and ideas, the centrality of clear threats and place within a broader national (political-military and inter-service) system, the importance of realism about technology, of ensuring a coherently argued internal logic, and finally being transparent about risks. From the days of AirLand battle, to the high optimism of NCW, through to the comprehensive approaches of the counter-insurgency era and its most recent evolution into hybrid warfare, military concept development has proliferated greatly and has been no stranger to controversy.

3.2. Warfighting concepts and favouring factors

New terms, acronyms, and entire concepts proliferate year upon year.

The evolution described in the previous section forms the historical basis for the analysis in this section. The six factors identified above form the analytical framework for the remainder of this report, taking those elements contributing to failure and inverting them to identify favouring factors. Using case evidence gained from both desk research and field work, and supported by literature on military innovation and adaptation, this chapter explores each of the major themes in conceptual history in turn.

First is whether a concept's language is sufficiently clear, as different states, services, and even individuals use similar terms interchangeably, describe similar concepts, and minorly adapt definitions. Second is whether a concept is out of step from a state's overall defence apparatus, either culturally or procedurally, and is subsequently indigestible outside of a small community of concept developers. The third centres on whether technology is sufficiently mature within a state and its armed forces for a concept to be viable. The fourth is whether there is clarity of threat. Some states, particularly those that perceive immediate threats to state survival, have concepts tailored to an extremely clear threat and set of corresponding scenarios. Others who do not perceive such existentiality have concepts with only vague descriptions. The fifth, which forms a core of the logic of this report, is the presence of a clear argument for how a given concept will make a difference, or a 'theory of success', with corresponding defeat mechanisms that contribute to the argument. Finally, the way in which conceptual work has addressed risk is included as a sixth factor.

3.2.1. Clarity of language

The military concept development world is rife with what insiders refer to as 'buzzword bingo'.[43] New terms, acronyms, and entire concepts proliferate year upon year. There are indeed entire structures who have the professional responsibility to contribute to this proliferation, such as the UK's Development, Concepts and Doctrine Centre (DCDC) and the US

42 Lukas Milevski, "Clausewitz at the Nexus of Competing Fashions in Western Strategic Thought," *Journal of Strategic Studies* 46, no. 4 (2023): 787–808.

43 Kate Bateman, "War on (Buzz) Words," *Proceedings*, August 2008, 20–23; Elena Wicker, "Full-Spectrum Integrated Lethality? On the Promise and Peril of Buzzwords," War on the Rocks, May 17, 2023, https://warontherocks.com/2023/05/full-spectrum-integrated-lethality-on-the-promise-and-peril-of-buzzwords/.

Army's Training and Doctrine Command (TRADOC).[44] NATO alone has thirty Allied Joint Publications (AJPs) which govern military doctrine, which themselves are subordinate to other concepts such as the NATO Warfighting Capstone Concept (NWCC) and the Concept for the Deterrence and Defence of the Euro-Atlantic Area (DDA).

What this mass of conceptual development ultimately creates is a 'Babylonian' mixture of language and ideas that are often developed in isolation from one another and essentially repackage already existing ideas. This is not in itself problematic, provided that the underlying assumptions are sound. Where the challenge lies is that new thinking coexists alongside past and already existing concepts, leading to multiple terms and ideas being referred to without shared meaning.[45] A NATO planner in Belgium is unlikely to be referring to the same 'multi-domain effects' as a US air force planner in Hawaii, yet both make the same reference. This mixture of language is then recycled consistently as new concepts develop, only further muddling the field.

3.2.2. **Regime fit**

Regime fit, or whether a concept fits within a national political-military context, is a central consideration in whether a concept spreads throughout a system or fails to be implemented.[46] New ideas and technologies cannot only be developed, but they must be institutionalised. This occurs at several levels, beginning at the civil-military apex and continuing down to the state of 'jointness' across the armed services and ending at which army echelon is the right one to 'do MDO'. In many cases, MDO concepts lack a firm footing across these political-military, inter-service, and intra-service levels.

New ideas and technologies cannot only be developed, but they must be institutionalised.

Civil-military relations are central, as the relationship between political leadership and military commanders has a direct bearing on the decision to use force and the way it is applied in contemporary conflict. A concept which envisions pre-emptive action against an opponent will not be a natural fit in states where parliament must authorise the use of force at any level. Similarly, in states where it is quite common and expected for political leaders and high-level commanders to be involved in tactical level matters, to align military action with diplomatic efforts for example, a concept centred on rapid action, dispersed mission command, and low levels of communication will be maladapted to the specific regime.[47] The choices made in developing new concepts often have direct bearing on civil-military relationships once implemented.[48]

44 David Morgan-Owen and Alex Gould, "The Politics of Future War: Civil-Military Relations and Military Doctrine in Britain," *European Journal of International Security* 7 (2022): 551–71.

45 Stephen Peter Rosen, *Winning the Next War: Innovation and the Modern Military*, Cornell Studies in Security Affairs (Ithaca, NY: Cornell University Press, 1991), 34–36.

46 Michael Horowitz, *The Diffusion of Military Power: Causes and Consequences for International Politics* (Princeton, NJ: Princeton University Press, 2010); Emily O. Goldman and Richard B. Andres, "Systemic Effects of Military Innovation and Diffusion," *Security Studies* 8, no. 4 (1999): 90–94; Williamson Murray, "Innovation: Past and Future," *Joint Forces Quarterly*, Summer 1996, 51–60.

47 Nina A. Kollars, "War at Information Speed: Multi-Domain Warfighting Visions," in *War Time: Temporality and the Decline of Western Military Power,* Edited by Sten Rynning, Olivier Schmitt, and Amelie Theussen, Chatham House Insights Series (London: The Royal Institute of International Affairs, 2021).

48 Morgan-Owen and Gould, "The Politics of Future War: Civil-Military Relations and Military Doctrine in Britain"; Victória M. S. Santos and Maíra Siman, "Civil-Military Relations as a 'Coordination Problem'? Doctrine Development and the Multiple 'Missions' of the Brazilian Armed Forces," *Critical Military Studies* 0, no. 0 (March 3, 2022): 1–21.

Below the political-military level is the inter-service dynamic. This often plays a significant role in concept development, particularly for MDO, as it steps directly into the turf-battles between services of who is the 'leader' and which are the 'followers'.[49] This occurs in both the development and implementation phases. Similar to the civil-military dynamic, the choices made in developing joint concepts naturally step on existing service equities. Command arrangements, mission and asset ownership, and project-specific funding priorities are all areas that can shape inter-service rivalry as concepts develop. In practice, this can even lead to some services opting out of joint concept development.[50] As already seen above, implementation of new ideas, such as the case of EBO and NCW in Afghanistan, led to tensions between ground and air forces as each vied for priority.

Finally, answering the question of who 'does' MDO is vital for conceptual work. It is not enough to vaguely reference a 'joint commander', a specific answer is required. For land forces this is particularly important, as it is much more difficult to adapt command structures in the midst of an ongoing ground battle than it is in an air or sea campaign. Identifying the right command echelon to coordinate MDO, within a specific national context, is vital to this question. As will be seen, answers range across cases from the battalion to the theatre levels of warfare, due in no small part to differences in the size of the cases' armed forces.

3.2.3. **Technological maturity**

Technological realism is essential as the maturity of weapons systems and enabling capabilities (such as communications) sets the outside boundaries of whether or not a concept is feasible.[51] This is particularly important in cases where multinationality is central to concepts, as allies and partners at different levels of technological maturity could well struggle to interoperate both on the battlefield and off. The consideration here is less on whether or not technology is transformative in warfare, but rather what is the impact of conceptually relying on technologies that have not yet matured. 'Mature' in this context means that a capability has been fully developed, resourced, and fielded in sufficient capacity by the armed forces. Fielding by experimental units is not considered as being at sufficient capacity.

For MDO, the most relevant technologies are sensing (ISR), communications, and strike platforms. Together these form the strike complexes theorised in the days of NCW. While not a panacea, the armed forces' abilities to detect opponents, effectively communicate and manoeuvre, and to finally strike targets remains at the core of MDO and contemporary warfighting in general. New technology in these areas essentially provides greater enablement to the modern system of combat that began with the development combined arms.[52]

49 Adam N. Stulberg, "Managing Military Transformations: Agency, Culture, and the U.S. Carrier Revolution," *Security Studies* 14, no. 3 (2005): 489–528.

50 Will Spears, "A Sailor's Take on Multi-Domain Operations," War on the Rocks, May 21, 2019, https://warontherocks.com/2019/05/a-sailors-take-on-multi-domain-operations/; James Joyner, "The Inter-Service Wars Are Looking Like Calvinball," War on the Rocks, August 26, 2015, https://warontherocks.com/2015/08/the-inter-service-wars-are-looking-like-calvinball/.

51 Michael Raska, "The Sixth RMA Wave: Disruption in Military Affairs?," *Journal of Strategic Studies* 44, no. 4 (June 7, 2021): 456–79, https://doi.org/10.1080/01402390.2020.1848818; Michael Raska, *Military Innovation in Small States: Creating a Reverse Asymmetry*, Cass Military Studies (London: Routledge Publishing, 2016), 8–10; Daniel R. Lake, *The Pursuit of Technological Superiority and the Shrinking American Military* (New York: Palgrave Macmillan, 2019), 79–80.

52 Biddle, *Military Power*, 28–51.

New military concepts have been routinely criticised, often rightly so, as being overly optimistic about the transformative role of technology on warfare.[53] This is most often due to the developer's premature belief that some new capability, be it a new missile or improved offensive cyber means, will transform what wars are fought over and how they are fought. As detailed in the previous chapter, this was the central, but false, assumption of much post-Cold War thought. This is not to take a luddite's approach to technology, but rather to stress the importance that it ought not to take on an overwhelmingly central role. The emphasis then is on how mature technologies are absorbed and employed into military systems.[54]

3.2.4. **Threat specificity**

As the saying goes, the enemy gets a vote. The development of new concepts cannot occur in a vacuum. Adversaries will adapt as well and new concepts can fail in wartime, as seen in the historical review above. Threat specificity is clearly vital for conceptual work. A concept that does not articulate the nature of the threat is hardly helpful to real soldiers fighting a real enemy.[55] The conceptual whirlwind surrounding the war on terror, from counter-insurgency to comprehensive approach clearly suffered from this. Vague threats such as 'terrorism' or 'peer state adversaries' are not sufficient to define the ways and means by which an opponent can be defeated.[56] Current concept development efforts risk this lack of clarity. Importantly, conceptual work should not be elastic enough that a single concept is applicable to multiple, disparate threats. Sub-concepts for specific threats are a clear direction to answer this challenge.

Such specificity is naturally simpler for smaller states with a very clear threat definition. Existentiality allows for much clearer threat perceptions.[57] It should generally be expected then that the further away a state is from its assumed adversary(ies), the less clear the threat conceptualisation.[58] Intriguingly, either a vague or overly broad understanding of threat does not seem to restrain states from hyping threats to their security, leading to a dissonant logic wherein existential arguments are made when no visible existential threat exists.

This specificity, while necessary, is not sufficient, however. Proper specificity should move well beyond just naming a particular adversary, but further describe precisely how the opponent's armed forces and conceptual approach pose a challenge to the current mode of operating.[59] Simply describing another states' military capabilities does not necessarily answer this problem either, as it should be placed within the context of how an opponent's capabilities pose specific threats. Publicly published conceptual work is unlikely to express this in great detail due to security concerns, but the point stands for classified work as well. Clearly, the identification of a specific opponent is only the beginning of a longer road of planning, conceptualisation, and rationalisation.

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53 Lawrence Freedman, *The Future of War: A History* (London: Public Affairs, 2019); Betz, *Carnage and Connectivity: Landmarks in the Decline of Conventional Military Power*; Biddle, *Military Power*.

54 Stephen Biddle, "Back in the Trenches: Why New Technology Hasn't Revolutionized Warfare in Ukraine," Foreign Affairs, August 10, 2023, https://www.foreignaffairs.com/ukraine/back-trenches-technology-warfare.

55 Murray, "Innovation: Past and Future"; de Czege, "Commentary on 'The US Army in Multi-Domain Operations 2028'"; Rosen, *Winning the Next War: Innovation and the Modern Military*.

56 Michael Howard, "What's in a Name? How to Fight Terrorism," *Foreign Affairs* 81, no. 1 (February 2002): 8–13.

57 Sagarin, *Learning From the Octopus: How Secrets from Nature Can Help Us Fight Terrorist Attacks, Natural Disasters, and Disease*; Kilcullen, *The Dragons and the Snakes: How the Rest Learned to Fight the West*.

58 Gregory F. Gause III, "Balancing What? Threat Perception and Alliance Choice in the Gulf," *Security Studies* 13, no. 2 (2003): 273–305; Stephen Walt, *The Origins of Alliances*, Cornell Studies in Security Affairs (Ithaca, NY: Cornell University Press, 1990).

59 Rosen, *Winning the Next War: Innovation and the Modern Military*, 7–8; Murray, "Innovation: Past and Future."

3.2.5. **Theories of success**

A theory of success organised around a defeat mechanism(s) is vital for a successful warfighting concept. Without a clear, written-out description of precisely how a concept could create intended outcomes it is much less a concept and rather a proposal for reorganisation or a procurement plan.

Theories of victory, or rather success, have received a fair amount of scholarly attention in recent years. The applicability of this theorising has been applied at both the grand strategic levels and on more niche topics such as nuclear planning.[60] Described by Jakobsen, such a theory is, "a persuasive argument that the chosen combination of ways and means is likely to produce the desired ends without excessive costs and risks."[61] In short, it is a logical argument. From a social scientific perspective, this would effectively take the form of an 'If...then... because' style of argumentation. What this provides is effectively a testable theory, one that can be explored in exercises and measured against real events.

Without a clear, written-out description of precisely how a concept could create intended outcomes it is much less a concept and rather a proposal for reorganisation or a procurement plan.

Continuing with Jakobsen, it requires strategists and/or conceptual planners to answer four central questions:

1. What threat/opportunity exists in my strategic environment (problem definition)?
2. What desirable future ends does my problem definition give rise to?
3. Which combinations of available ways and means can achieve my desired ends within the relevant timeframe?
4. What combination of ways and means is most likely to achieve my ends with acceptable risks?[62]

Defeat mechanisms, or processes that causes the physical and psychological damage that drive armies to defeat, can effectively act as the organising logic by which ways and means are combined to achieve defined ends (questions 3 and 4).[63] This idea has itself garnered noticeable attention, particularly by American and Israeli defence experts.[64]

There is an implicit bias to note within defeat mechanisms from the outset, a focus on the offensive. This bias is what makes defeat mechanisms useful as a part of a warfighting concept's theory of success, by focusing on the actual engagement of an opponent's armed forces. The implicit assumption of most mechanisms, then, is that the context of its use is when deterrence has already failed and combat has been chosen as the next step.

60 Peter Viggo Jakobsen, "Causal Theories of Threat and Success – Simple Analytical Tools Making It Easier to Assess, Formulate, and Validate Military Strategy," *Scandinavian Journal of Military Studies* 5, no. 1 (September 9, 2022): 177–191, https://doi.org/10.31374/sjms.164; Jeffrey W. Meiser, "Ends+Ways+Means=(Bad) Strategy," *The US Army War College Quarterly: Parameters* 46, no. 4 (December 1, 2016), https://doi.org/10.55540/0031-1723.3000; Brad Roberts, "On Theories of Victory, Red and Blue," Livermore Papers on Global Security (Livermore, CA: Lawrence Livermore National Laboratory, June 2020), https://cgsr.llnl.gov/content/assets/docs/CGSR-LivermorePaper7.pdf; Davis Ellison and Kestutis Paulauskas, "Strategy Is Dead and Victory Is Irrelevant?" (Future of War Conference, Amsterdam: Netherlands Royal Military Academy, 2022).

61 Jakobsen, "Causal Theories of Threat and Success – Simple Analytical Tools Making It Easier to Assess, Formulate, and Validate Military Strategy."

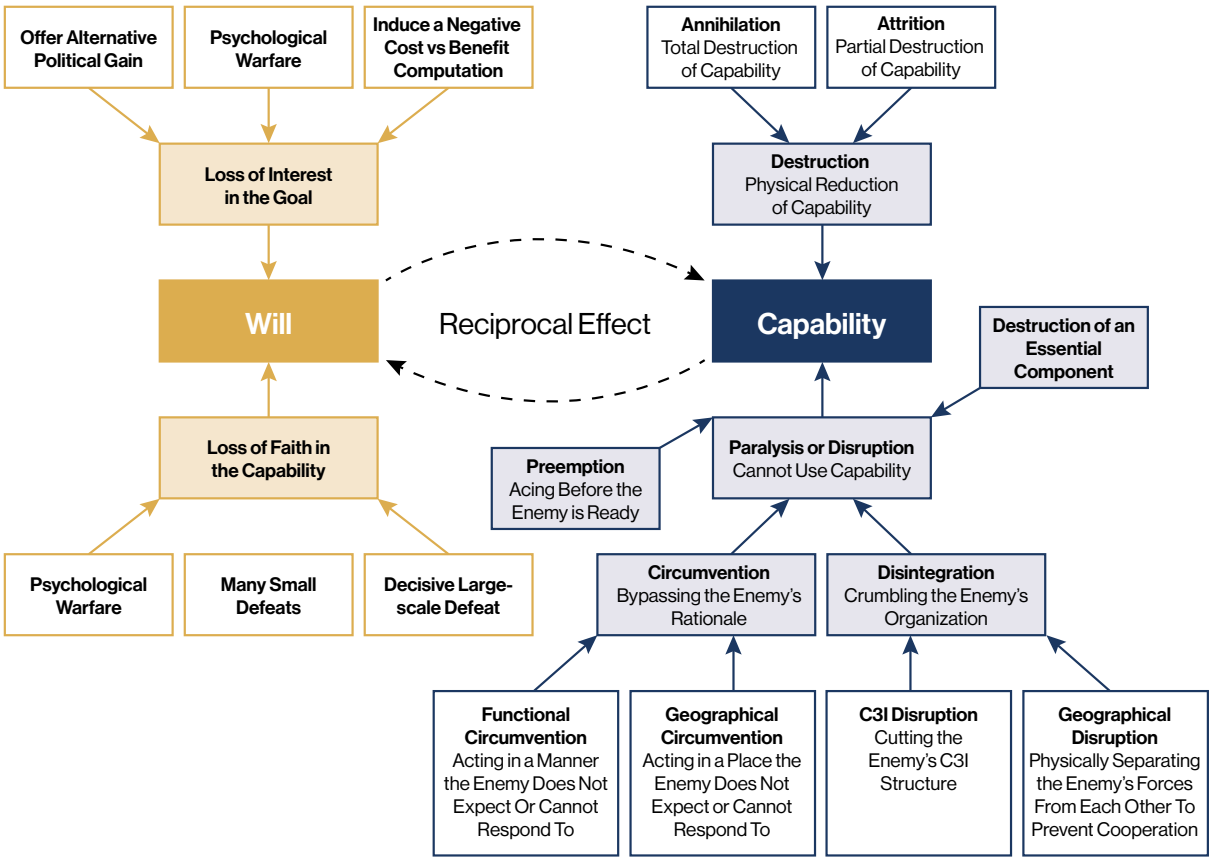
62 Jakobsen.

63 Eado Hecht, "Defeat Mechanisms: The Rationale Behind the Strategy," *Military Strategy Magazine* 4, no. 2 (2014): 24–30.

64 Hecht; Frank Hoffman, "Defeat Mechanisms in Modern Warfare," *The US Army War College Quarterly: Parameters* 51, no. 4 (November 17, 2021): 49–66, https://doi.org/10.55540/0031-1723.3091; Frank Hoffman, "Updating Defeat Mechanisms: Concepts of Victory for Contemporary Warfare," *Marine Corps Gazette*, February 2022, www.mca-marines.org/gazette.

As described by both Hecht and Hoffman, such mechanisms can target either the will or the capability of an opponent, noting that the impact of a chosen action or approach is reciprocal between the two. Figure 1, developed by Hecht, provides a general overview of the types of mechanisms and the reciprocal effect between targeting will and capabilities.

Figure 2. Eado Hecht, "Defeat Mechanisms: The Rationale Behind the Strategy," Military Strategy Magazine 4, no. 2 (2014): 24–30.



Source: Dr. Eado Hecht

Additional definitions by Hoffman stress destruction, dislocation, degradation, and disorientation, while official US joint doctrine identifies destruction, attrition, exhaustion, dislocation, disintegration, isolation, disruption, degradation, denial, and neutralisation as mechanisms.[65]

Cutting through competing definitions and lists, this report identifies the following as the basic defeat mechanisms that can be useful for warfighting concepts to develop a testable theory of success: destruction, circumvention, and disintegration. Each can be utilised at differing pace and scale to potentially cause different effects. An overly exhaustive or delineated list risks both conceptual incoherence over time and of confusing cause and effect. These have been specifically identified by first focusing on the operational or higher-tactical level of

65 Hoffman, "Defeat Mechanisms in Modern Warfare"; "Joint Publication 5-0: Joint Planning" (US Joint Chiefs of Staff, December 1, 2020), https://irp.fas.org/doddir/dod/jp5_0.pdf.

mechanism and secondly by identifying them as *primary* mechanisms which can be achieved in a variety of ways, yet remain the same as a mechanism.

The use of mechanisms in an overly mechanistic way has been criticised, particularly in the context of trying to cause an opponent's 'cognitive paralysis' or 'get inside their OODA (observe, orient, decide, act) loop'.[66] It is noted that a conceptual focus on 'shocking' an enemy's cognitive capacities and leading them to be paralysed underestimates the resilience of an opponent. Additionally, that such an approach could *replace* destruction or actual combat is seen as a particularly dangerous assumption.[67] Indeed, this concern is precisely what fuelled criticisms of EBO in the early 2000s, with both Mattis and Biddle arguing in different contexts that such an effect cannot be planned for and is overly optimistic about the prospects for success.[68] This over-optimism, particularly if multiple opponents share this offensive optimism, risks a rush to war in early stages of a crisis and to confusion should initial offensive actions fail.[69]

Pulling these elements together then, the use of such a theory in a hypothetical case could appear as follows:

> *"IF NATO forces adopt an MDO approach that incorporates long-range precision fires alongside forward defensive systems, THEN these forces can effectively defeat a Russian attack along the eastern flank, BECAUSE these divisions can effectively target rear-echelon targets while blunting assaults by frontline Russian units."*

3.2.6. **Risk considerations**

A key element that is often missed in new warfighting concepts, and indeed in many assessments of them, is the inherent risk carried by the adoption of a new approach. Each new concept, be it AirLand battle, EBO, NCW, COIN, or now MDO involves implicit trade-offs that carry risks. By prioritising one or another threat, selecting specific capabilities, or proposing new organisational structures, choices have been made that are rarely made explicit.

Context is important in identifying where possible trade-offs have been made. The timing of particular development efforts imply a certain deprioritisation of certain activities. As described above, this can be seen in the aftermath of failed campaigns. AirLand battle served an equal purpose of pulling the US Army away from counter-insurgency. The risk inherent in that is the military does not actually have a final say in how it will be used, and overpreparing for a narrowly preferred scenario risks readiness for other possible tasks. Internal risk is a vital factor to identify in concept development and assessment of concepts once developed.

66 Heather Venable, "Paralysis in Peer Conflict? The Material versus the Mental in 100 Years of Military Thinking," War on the Rocks, December 1, 2020, https://warontherocks.com/2020/12/paralysis-in-peer-conflict-the-material-versus-the-mental-in-100-years-of-military-thinking/; Adam Elkus, "The Rise and Decline of Strategic Paralysis," Small Wars Journal, September 17, 2011, https://smallwarsjournal.com/jrnl/art/the-rise-and-decline-of-strategic-paralysis.

67 Venable, "Paralysis in Peer Conflict? The Material versus the Mental in 100 Years of Military Thinking."

68 Biddle, "Afghanistan and the Future of Warfare"; Mattis, "USJFCOM Commander's Guidance for Effects-Based Operations."

69 Jack Snyder, *The Ideology of the Offensive: Military Decision Making and the Disasters of 1914*, Cornell Studies in Security Affairs (Ithaca, NY: Cornell University Press, 1989).

The six themes detailed above are summarised in Table 3 below.

Table 3. Factors favouring adoption and implementation of warfighting concepts

Factor	Description	Components
Clarity of Language	Whether a concept uses sufficiently clear language and consistent ideas	Commonly understood language across allies, government, and services
Regime fit	Whether a concept fits in its overall national/multinational context	Due consideration of political-military, inter-service, and intra-service dynamics
Technological Maturity	Whether a concept centres on mature or nascent technologies	Identification of specific systems that have been either been fielded or are only under development
Threat Specificity	Whether a concept clearly details a threat to which it is responding	A clearly named state or non-state threat and a specific description of how its military poses a threat
Theory of Success	Whether a concept has a clear argument as to how it will cause the outcome it intends to have	A causal argument that: 1) identifies a particular problem, 2) poses a theory of how to solve that specific problem, 3) links ways and means to argue how that theory will cause the problem to be solved, 4) considers the risks carried with pursuing the particular theory
Risk consideration	Whether a concept explicitly acknowledges the risks that its implementation carries	Commanders may be overloaded; over-reliance on connectivity; over-engineering; coordination may not be greater than the sum of its parts

These key themes are further drawn upon in the following chapter to consider the evidence gathered on each of the eight cases identified for this study. This consideration, itself based on decades of empirical evidence, will form the basis for the conclusions and recommendations of this report.

4. Taking stock of MDO: Evidence from Cases

This chapter considers the six factors identified above in the context of the eight cases selected for this report (Denmark, France, Germany, Israel, NATO, Taiwan, the UK, and the US). It concludes with an overall classification of MDO types. The detailed information used in this chapter can be found in the Annexes attached at the end of this report.

MDO concept development across cases has lacked clarity and worsened confusion across multinational efforts.

4.1. Unclear language

MDO concept development across cases has lacked clarity and worsened confusion across multinational efforts. The lack of clarity in language can be seen at play in the number of differing US approaches to MDO, with the Army and Air Force being particularly competitive, while the Navy and Marine Corps staffs seem to have removed themselves from the debates.[70] Smaller states seemingly have less of a tendency to worsen proliferation, simply because there is usually only one organisation responsible for the development of this conceptual work, as in the cases of Germany, France, Denmark, and Israel. The UK is an outlier in this regard, however, as DCDC is particularly prolific with the development of joint concept notes that closely mirror-image the confusion that can be found in the US, though as a joint centre it does balance service-specific proliferation.

There are, across the eight cases, a wide variation of terms and meanings. Multi-domain is followed by a variety of terms, chiefly 'operations' (Denmark[71], NATO[72], US[73]), 'integration'

70 Spears, "A Sailor's Take on Multi-Domain Operations."

71 "Multi-National Capability Development Campaign - Multi-Domain Multi-National Understanding Report Annex A" (Norfolk, VA: NATO, November 2022).

72 "Alliance Approach to Multi-Domain Operations" (NATO Allied Command Transformation, 2022).

73 General James C. McConville, "Army Multi-Domain Transformation: Ready to Win in Competition and Conflict" (Washington, D.C.: Headquarters, Department of the Army, March 16, 2021).

(UK[74]), 'manoeuvre' (Israel[75]) and 'deterrence' (Taiwan[76]). Multimilieux/multichamps is the French term[77], while Germany references Multidimensionalität.[78] Domain and dimension often take on different meanings, with some (Denmark, France, Germany, Israel, US) referring explicitly and only to the five military domains (air, sea, land, cyber, space) while others (UK and Taiwan) understand the term more broadly to possibly include other government functions. This gallery of terms becomes even more complex outside of English, where the terms domain and dimension are sometimes used interchangeably, such as in German and Hebrew. Major exercises across most military powers refer to the concept in a wide variety of ways. Some describe multi-domain operations at the corps or battalion level. Others simply as 'operations'. Some are single service and testing one unit, others are whole of government.[79] Table 4 below summarises the various national definitions.

Where there is more commonality across cases is in the identification of specific capabilities, with the following appearing most prevalently across cases:

- Developing and/or procuring long-range precision fires
- C4ISR improvements
- Building multi-domain manoeuvre divisions
- Establishing a comprehensive (i.e. 'whole of government') approach
- Reorganising joint forces, especially in strategic headquarters
- Integrating non-kinetic actions (e.g. space and cyber)

74 Ministry of Defence, "Joint Concept Note 1/20, Multi-Domain Integration" (Ministry of Defence, November 2020), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/950789/20201112-JCN_1_20_MDI.PDF.

75 Yaakov Lappin, "The IDF's Momentum Plan Aims to Create a New Type of War Machine," *Begin-Sadat Center for Strategic Studies* (blog), March 22, 2020, https://besacenter.org/idf-momentum-plan/.

76 "Taiwan National Defense Report 2021" (Taipei: Ministry of National Defense, October 2021), https://www.ustaiwandefense.com/tdnswp/wp-content/uploads/2021/11/Taiwan-National-Defense-Report-2021.pdf; "Taiwan 2021 Quadrennial Defense Review" (Taipei: Ministry of National Defense, 2021), https://www.mnd.gov.tw/NewUpload/%E6%AD%B7%E5%B9%B4%E5%9C%8B%E9%98%B2%E5%A0%B1%E5%91%8A%E7%B8%BD%E6%AA%A2%E8%A8%8E(QDR)/%E6%AD%B7%E5%B9%B4%E5%9C%8B%E9%98%B2%E5%A0%B1%E5%91%8A%E7%B8%BD%E6%AA%A2%E8%A8%8E(QDR).files/%E6%AD%B7%E5%B9%B4%E5%9C%8B%E9%98%B2%E5%A0%B1%E5%91%8A%E7%B8%BD%E6%AA%A2%E8%A8%8E(QDR)-110/110%20QDR(%E8%8B%B1%E6%96%87%E6%AD%A3%E5%BC%8F%E7%89%88).pdf.

77 Philippe Gros et al., "Intégration Multimilieux / Multichamps : Enjeux, Opportunités et Risques à Horizon 2035" (Fondation pour la recherche stratégique, 2022), https://www.frstrategie.org/sites/default/files/documents/publications/recherches-et-documents/2022/102022.pdf.

78 Generalleutnant Alfons Mais, "Mittlere Kräfte - Operative Reaktionsfähigkeit Und Motor Der Modernisierung" (FKH-Symposium, Köln, April 26, 2023).

79 Judah Ari Gross, "In 1st Drill, IDF's Ghost Unit Tests out New Tactics with Jets, Tanks and Robots," July 23, 2020, https://www.timesofisrael.com/in-1st-drill-idfs-ghost-unit-tests-out-new-tactics-with-jets-tanks-and-robots/; Tania Donovan, "Lightning Edge 21: 25th Infantry Division Exercises Multi-Domain Task Force Capabilities," US Army, May 14, 2021, https://www.army.mil/article/246417/lightning_edge_21_25th_infantry_division_exercises_multi_domain_task_force_capabilities; Orlandon Howard, "US Army Tests New Multidomain Ops Doctrine in Warfighter Exercise," US Army, October 18, 2022, https://www.army.mil/article/261239/us_army_tests_new_multidomain_ops_doctrine_in_warfighter_exercise; Armee Francaise, "Press Kit: ORION 23" (Press notice, Exercise ORION 23, Paris, February 2023), https://www.defense.gouv.fr/sites/default/files/operations/20230228_Press_Kit_Orion.pdf; "NATO Exercise STEADFAST JUPITER 2022 Concludes," NATO Joint Warfare Centre, October 20, 2022, https://www.jwc.nato.int/articles/steadfast-jupiter-2022-concludes; "BALTOPS 22, the Premier Baltic Sea Maritime Exercise, Concludes in Kiel," US Navy, June 17, 2022, https://www.navy.mil/Press-Office/News-Stories/Article/3066830/baltops-22-the-premier-baltic-sea-maritime-exercise-concludes-in-kiel/https%3A%2F%2Fwww.navy.mil%2FPress-Office%2FNews-Stories%2FArticle%2F3066830%2Fbaltops-22-the-premier-baltic-sea-maritime-exercise-concludes-in-kiel%2F.

Table 4. Summary of national MDO-type definitions

Case	Definition
Denmark	Currently adopts NATO definition.
France	"*Multimilileux/multichamps* operations combine an appropriate posture of force, associating pre-deployed and expeditionary forces, multi-media and multi-field capabilities technology and the ability to more natively integrate joint effects."[80]
Germany	Currently adopts NATO definition.
Israel	"...field units would be able to operate simultaneously on the ground, underground, in the air, in the electromagnetic spectrum, and in the cyber domain."[81] (Note: unofficial)
NATO	"The orchestration of military activities, across all domains and environments, synchronised with non-military activities, to enable the Alliance to create converging effects at the speed of relevance."[82]
Taiwan	"...to inflict multi-domain interception blows and joint firepower strikes to sequentially weaken the enemy's operational capabilities and dismantle its offensives, obstruct its landing, and ultimately thwart its aggression."[83]
UK	"The posturing of military capabilities in concert with other instruments of national power, allies and partners; configured to sense, understand and orchestrate effects at the optimal tempo, across the operational domains and levels of warfare."[84]
US	"Operations conducted across multiple domains and contested spaces to overcome an adversary's (or enemy's) strengths by presenting them with several operational and/or tactical dilemmas through the combined application of calibrated force posture; employment of multi-domain formations; and convergence of capabilities across domains, environments, and functions in time and spaces to achieve operational and tactical objectives."[85]

There does appear to be a more general understanding of what capabilities make up a possible MDO approach, particularly when it comes to an emphasis on long-range precision fires, C4ISR investments, and the role on non-kinetic action. A later section will continue into how technology generally fits within MDO, however it is worth stressing here some commonality of capabilities identified.

What the current era of concept development demonstrates is a continued and even increased proliferation of terms and ideas that do not have a shared meaning. Importantly, once a new concept is agreed, its implementation does not always adhere to the terms agreed in the original document. As seen in the exercise cases above, terms like 'multi-domain' are made to fit whichever context is relevant at the time.

4.2. **Weak regime fit**

A weak regime fit can be found across cases at the political-military, inter-service, and intra-service levels. This has been seen more recently in the British armed forces development of its multi-domain integration (MDI) concept, which carries an implicit centrality for the military in a coordination role for all security affairs, which has been at crossed odds with the

80 CICDE, "Concept d'emploi Des Forces," 2020, https://www.defense.gouv.fr/sites/default/files/cicde/20201202-NP-CIA-01_CEF2020.pdf.

81 Lappin, "The IDF's Momentum Plan Aims to Create a New Type of War Machine."

82 "Alliance Approach to Multi-Domain Operations."

83 "Taiwan National Defense Report 2021."

84 Ministry of Defence, "Joint Concept Note 1/20, Multi-Domain Integration."

85 McConville, "Army Multi-Domain Transformation: Ready to Win in Competition and Conflict."

Foreign, Commonwealth, and Development Office (FCDO). It should also be noted that MDI, itself operating under the Integrated Operating Concept (IoPC), functioned partly to conceptualise a military role for the Conservative government's 'global Britain' agenda.[86]

In inter-service rivalry, the US case has been particularly strong and has had direct impacts on efforts to institutionalise MDO across the whole joint force. The US Army and Air Force led competing development efforts, while the Navy and the Marine Corps developed their own service specific approaches that focused very specifically on the Western Pacific.[87] Notionally, much of this should be resolved with the finalisation of the Pentagon's Joint Warfighting Concept, to which service concepts would then be subordinate.[88] However, leadership changes and bureaucracies have a way of derailing even the best efforts.

For many cases pursuing MDO, namely the US, UK, Germany, France, and Israel, the division has been envisaged as the most appropriate echelon at which actions originating from across different domains can be coordinated. This is particularly seen in the light of coordinating longer-range precision fires that are held above even the corps-level by a regional or theatre-level commander. A division commander arguably has a sufficient span of control and influence to be able to coordinate with other domains as initiative can be delegated to lower command echelons.[89]

However, this has not been entirely rationalised across cases. Both the US and Israel have multi-domain units (the US Multi-Domain Task Force and the IDF's 'Ghost' unit) which sit at different levels, the US case effectively being theatre-level missile brigades (based in both Europe and the Pacific) and the Israeli an experimental special forces battalion. In other cases, such as the UK, France, and Germany, even the division level currently lacks critical enablers such as ISR and relies heavily on the US[90], opening the question of who 'does' MDO in both a joint *and* multinational setting. This is crucial for states such as the Netherlands whose land forces are by design integrated into another state's military (in the Netherlands' case the Dutch army's three brigades are increasingly integrated into German army divisions).[91]

In general, the cases included here can be classified into different models of MDO types within particular regimes. Differing political-military, inter-service, and intra-service dynamics roughly fall across two main axes:

- Military-Only < - > Comprehensive Approach
- Technology-Centric < - > Organisation-Centric

86 Morgan-Owen and Gould, "The Politics of Future War: Civil-Military Relations and Military Doctrine in Britain."

87 Phil Clare, "The Answer Is Multi Domain Operations – Now What's the Question?," *Wavell Room* (blog), February 13, 2020, https://wavellroom.com/2020/02/13/the-answer-is-multi-domain-operations-now-whats-the-question/; Spears, "A Sailor's Take on Multi-Domain Operations."

88 Laura Heckmann, "Joint Warfighting Concept 3.0 'Definitely Coming,' Official Says," National Defense, April 5, 2023, https://www.nationaldefensemagazine.org/articles/2023/4/5/joint-warfighting-concept-30-definitely-coming-official-says.

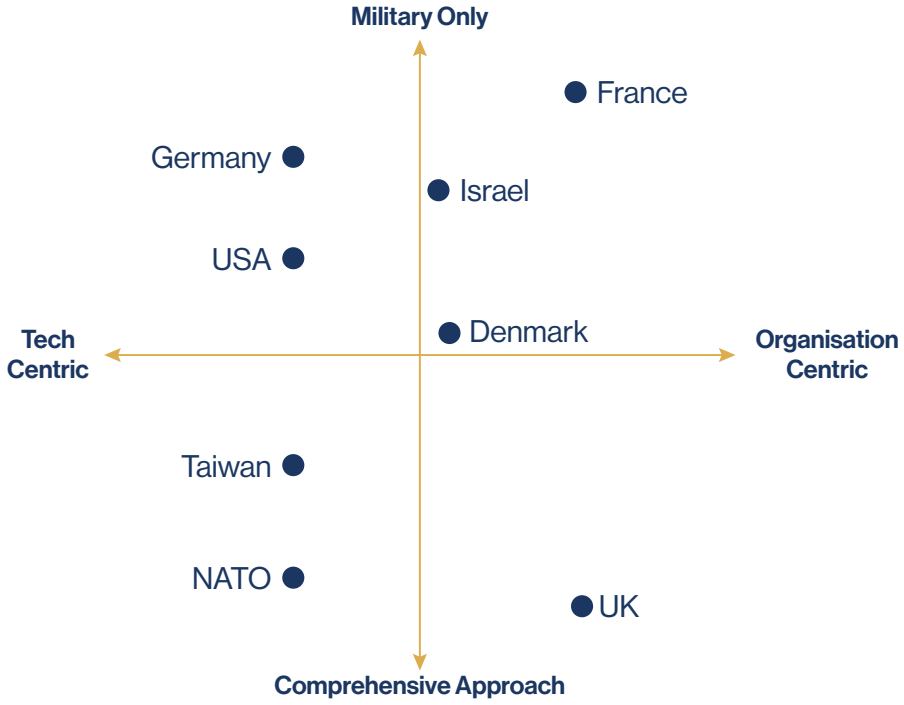
89 King, *Command: The Twenty-First Century General*, 295.

90 Ben Barry et al., "The Future of NATO's European Land Forces: Plans, Challenges, Prospects" (London: International Institute for Strategic Studies, 2023), https://www.iiss.org/research-paper/2023/06/the-future-of-natos-european-land-forces/; Douglas Barrie et al., "Northern Europe, The Arctic and The Baltic: The ISR Gap" (London: International Institute for Strategic Studies, December 19, 2022), https://www.iiss.org/en/research-paper/2022/12/northern-europe-the-arctic-and-the-baltic-the-isr-gap/.

91 Lt Gen Andreas Marlow and Lt. Col. Wilson C. Blythe, Jr., "Multi-Domain Warfighting in NATO: The 1 German-Netherlands Corps View," *Military Review*, June 2022, 1–12.

Military-only refers to those concepts that direct their focus solely on the military itself, and make no or very limited reference to other government instruments. Contrasted to this is a comprehensive approach, which envisions MDO not as a military-led concept but rather a whole of government effort that involves many non-military government and even private entities. A technology-centric concept emphasises the development or procurement of newer capabilities that facilitate rapid action (such as missiles or C4ISR systems) while an organisation-centric approach is more focused on establishing new units or reorganising existing forces in a new way. Based on the case studies included in the annexes, supported by field work, different national cases can be classified as follows:

Figure 3. National MDO Regime Models



Without a firm political-military, inter-service, intra-service, and possibly intra-alliance footing, new concepts may ultimately be doomed to fail as institutions fail to digest them.

This typology reveals that states have pursued a variety of MDO-style concepts, with the majority focusing more exclusively on the military (Denmark, France, Germany, Israel, US) and only the UK approach resembling a purely comprehensive or whole-of government style approach. Taiwan and NATO stand out as interesting cases due to their nearly equal emphasis on whole-of-government coordination and on the development/procurement of new technologies. As already highlighted, comprehensive-organisational models risk political-military tension, while military-organisational ones tempt inter-service rivalry as it touches upon command relationships.

Interestingly, states with some of the deepest cooperation, e.g. France-Germany and US-UK, appear to have disparate conceptual approaches, while those with no cooperation whatsoever, e.g. Taiwan-NATO have relatively similar approaches despite having very different contexts and overall regime types. Additionally, what stands out is that the NATO concept

is quite different in form from the concepts of five of its allies, being most similar to the UK's MDI concept. This could indicate a possible future tension between alliance-level and national-level concept development.

Without a firm political-military, inter-service, intra-service, and possibly intra-alliance footing, new concepts may ultimately be doomed to fail as institutions fail to digest them. The risk of being overly sensitive to this dynamic however is that ideas that may cause friction out of a desire for easy acceptance may be prematurely discarded. Concepts that do so resemble Freedman's criticism of some strategies that, "actually avoid the topic, lack focus, cover too many dissimilar or only loosely connected issues and themes, address multiple audiences to the satisfaction of none, and reflect nuanced bureaucratic compromises."[92]

4.3. **Technological (im)maturity**

That a significant amount of conceptual and even higher strategic-level work is being done on the assumption of technological maturity is a serious flaw in the current generation of efforts.

Of the concepts included within this study, most fall prey to the technological overconfidence tendency, particularly in the field of communications. The US, UK, France, Germany, Israel, Taiwan, and NATO all place some style of next-generation C4ISR (Command, Control, Communications, Computers (C4) Intelligence, Surveillance and Reconnaissance (ISR)) at the core of their concept, assuming an assured availability of strong networks in the relatively near future. Only Denmark is an outlier as its concept development is in quite early stages, thought it has signed onto the NATO concept. In reality, and despite a significant amount of attention in recent years, the level of assured connectivity upon which much MDO thought is predicated is far from realistic.[93] That a significant amount of conceptual and even higher strategic-level work is being done on the assumption of technological maturity is a serious flaw in the current generation of efforts.

Perhaps the aim of this conceptual reliance on immature communications technology is to spur its further development, a dynamic that has been seen in other capability areas.[94] This is a particularly dangerous area for optimism, however. High-level efforts in recent years such as the US Joint All-Domain Command and Control system (JADC2) have yet to take major steps[95], and Russian, Chinese, and Iranian forces have invested heavily into electronic warfare capabilities over the past decades precisely because of the central reliance on assured communications amongst Western-style armed forces.[96]

In other areas, namely sensing and fires, there is much greater maturity in technology. States have heavily invested in missiles and long-range artillery in recent years, a trend which has

92 Lawrence Freedman, *Strategy: A History* (Oxford: Oxford University Press, 2013), 610–11.

93 Scott Pence, "Fighting as Intended: The Case for Austere Communications," *Joint Forces Quarterly* 102 (Q3 2021): 4–13.

94 Lake, *The Pursuit of Technological Superiority and the Shrinking American Military*.

95 Maggie Smith and Jason Atwell, "A Solution Desperately Seeking Problems: The Many Assumptions of JADC2," Modern War Institute, May 3, 2022, https://mwi.westpoint.edu/a-solution-desperately-seeking-problems-the-many-assumptions-of-jadc2/; Jaspreet Gill, "DoD, Military Services 'haven't Actually Defined' the JADC2 Problem: Navy Official," *Breaking Defense* (blog), October 27, 2022, https://breakingdefense.sites.breakingmedia.com/2022/10/dod-military-services-havent-actually-defined-the-jadc2-problem-navy-official/.

96 Kilcullen, *The Dragons and the Snakes: How the Rest Learned to Fight the West*; Cliff, *China's Military Power: Assessing Current and Future Capabilities*; Jonsson, *The Russian Understanding of War: Blurring the Lines between War and Peace*; Engstrom, "Systems Confrontation and System Destruction Warfare."

accelerated following Russia's escalated invasion of Ukraine.[97] ISR platforms have been particularly mature for some time, with platforms such as the MQ-9 Reaper UAV having been fielded for nearly two decades. Space-based ISR has also continued to advance rapidly.[98] The primary challenge for small and middle powers, particularly within NATO, is that the vast majority of ISR is provided by the US and there is a significant lack of ISR capacities within European NATO.[99]

New warfighting concepts, particularly those that contain an explicit call for force transformation, should be warier about the impact of immature technologies. Investments into communications, longer-range systems, and improved sensing are certainly worth the continued effort, however from a 'war-winning' perspective, they should not take centre stage as transformative. Most specifically, the vital 'hinge' between 'sensing and shooting', the communications systems, are far from sufficient maturity and are highly differentiated multinationally. As will be explored in further detail below, ensuring sufficient mass and capacity in conventional forces should play at least an equal role.

4.4. **Vague threat descriptions**

The cases included in this study often have overly vague threat descriptions. NATO states are often only implicit in the actual problem to which their concepts are solving, both out of concerns for public perception but also to maintain flexibility in their armed forces. Despite this, it is quite clear that the conceptual work done in the UK, France, Germany, and Denmark is focused on Russia and NATO's eastern flank. NATO itself is aided in its specificity in that the alliance, through its 2022 Strategic Concept, has two threats which it has agreed to identify: Russia and terrorist organisations.[100] The US is an intriguing case as its efforts must span global interests. The US Army's MDO concept is effectively designed around both a Baltic and Taiwan scenario, implicitly identifying the main problem as ensuring manoeuvrability in a missile-dominated environment.

The UK is an interesting case in point on vague threat descriptions. While its MDI concept does identify Russia as it's "pacing threat", it then quickly follows up with equal reference to China, Iran, and North Korea.[101] This is then further complicated with the introduction of "sub-threshold" actions using "proxies, coercion, offensive cyber and lawfare."[102] Such descriptions do not allow for the creation of the type of clear causal logic described by de

97 Paul van Hooft and Davis Ellison, "Good Fear, Bad Fear: How European Defence Investments Could Be Leveraged to Restart Arms Control Negotiations with Russia," Strategic Stability: Deterrence and Arm Control (The Hague: The Hague Centre for Strategic Studies, April 2023), https://hcss.nl/report/good-fear-bad-fear-how-european-defence-investments-could-be-leveraged-to-restart-arms-control-negotiations-with-russia/.

98 Thomas D. Taverney, "The Evolution of Space-Based ISR," *Air & Space Forces Magazine* (blog), August 10, 2022, https://www.airandspaceforces.com/article/the-evolution-of-space-based-isr/.

99 Colin Wall and John Christianson, "Europe's Missing Piece: The Case for Air Domain Enablers," Transforming European Defense (Washington, D.C.: Center for Strategic and International Studies, April 17, 2023), https://www.csis.org/analysis/europes-missing-piece-case-air-domain-enablers; Barrie et al., "Northern Europe, The Arctic and The Baltic"; Daniel Fiott, "European Defence and the Demands of Strategic Autonomy," The Hague Centre for Strategic Studies, August 13, 2021, https://hcss.nl/report/european-defence-and-demands-of-strategic-autonomy/.

100 "NATO Strategic Concept 2022" (NATO, 2022), https://www.nato.int/strategic-concept/.

101 Ministry of Defence, "Joint Concept Note 1/20, Multi-Domain Integration," 3–4.

102 Ministry of Defence, 5.

Czege or Jakobsen.[103] Past conceptual success, in particular in the form of AirLand battle, was closely tied to the concept's close tailoring and applicability to very specific challenges posed by the Warsaw Pact in Europe. Sub-threshold or 'grey zone' risks stemming from all of government actions by multiple actors is not a sufficient problem definition to theorise and plan against.

Germany's development of MDO appears to show positive signs of threat specificity. The head of the German Army describes in current modernisation planning the particular challenge of the German Army reinforcing the NATO enhanced forward presence battlegroup in Lithuania (of which Germany is the lead nation). The attendant challenge of Russian forces in Kaliningrad is naturally an important element of this.[104] However, given Germany's commitments to a new NATO battlegroup in Slovakia alongside ongoing NATO operations in Kosovo and Iraq, it is quite likely that a finalised, joint concept may become less threat specific.

Two cases, Taiwan and Israel, stand out as being highly specific, with their respective multi-domain efforts explicitly designed around a particular scenario. For Taiwan, it is the prevention of a Chinese People's Liberation Army amphibious assault on the island, while Israel has focused on the possibility of a Third Lebanon War and the role of Iran.[105] The unique situations of Israel and Taiwan are defined by their geographies, and arguably serve as a model for other smaller states in similar conditions such as the Baltic states. Threat specificity for states in a similar situation is easy, and open granularity on threat descriptions is more possible.

Theories of success are often lacking across the cases of this study.

However, as noted earlier this is not necessarily a sufficient condition. Israel had a clear threat definition in southern Lebanon (Hezbollah) as did NATO forces in the early phases of the Afghanistan war (Taliban and al-Qaeda fighters). In the former case threat clarity could not be resolved by technical means, while in the latter the threat description morphed as the war on terror became a global campaign. Both serve as a warning that knowing your enemy is only the first step in a long process of minutely defining a threat.

Detailed threat descriptions will be a perennially difficult challenge for concept developers, particularly in multinational structures such as NATO. The most detailed assessments quite often remain classified, and achieving a common inter-service and intra-alliance view of threat specificity is a challenge unto itself. The challenge remains, however, to have an adequately granular problem definition against which a theory of success can be formulated, as in order for ways and means to be described and aligned, they must be aligned against something tangible.

4.5. **Lacking clear theories of success**

Theories of success are often lacking across the cases of this study. Only France, Israel, and Taiwan make a tentative causal case of how the new approaches envisioned within their respective MDO concepts will cause the defeat of the opponent. For France, the aim is to disintegrate the enemy's forces and to prevent them from being able to cohere and

103 de Czege, "Commentary on 'The US Army in Multi-Domain Operations 2028'"; Jakobsen, "Causal Theories of Threat and Success – Simple Analytical Tools Making It Easier to Assess, Formulate, and Validate Military Strategy."

104 Mais, "Mittlere Kräfte - Operative Reaktionsfähigkeit Und Motor Der Modernisierung."

105 Lappin, "The IDF's Momentum Plan Aims to Create a New Type of War Machine"; "Taiwan National Defense Report 2021."

function.[106] This however does not receive additional attention as to how it then leads to the defeat of a particular opponent.

France is a case in which many of the pieces are there but not necessarily strung together into a fully clear causal argument. Its *Concept d'emploi des forces* highlight a number of operational superiority factors the armed forces must possess in order to succeed on the battlefield: command performance, moral force, understanding, agility, influence, endurance, speed, credibility and mass. In this light, its approach to *multimilieux/multichamps* (M2MC) is to converge joint effects to "take the initiative to seize opportunities and exploit them."[107] While perhaps valid in their own right, and easily recognisable to strategists from Clausewitz to Liddel-Hart, these elements do not in and of themselves form a theory of success. It is rather a desired set of abilities which are assumed, based on the long history of military thought, to be decisive. There is not, however, a clear argument as to how differing ways could leverage means to cause a specific adversary to be defeated.

For Israel and Taiwan, perhaps unsurprisingly, the emphasis is on the destruction of opponent capabilities, particularly missiles and ships, as rapidly as possible.[108] Given that in these cases trading space for time is not a viable option, this places a high value on *pre-emptive* destruction. Germany is perhaps similar, with its seeming focus on reinforcing the Baltic states, but this is generally unclear in the documents available. The implicit nature of many of the cases is generally unsurprising given the desire for strategic ambiguity pursued by governments and security restrictions regarding specific military-strategic aims. The general lack of this explicit thinking across cases remains an area for continued intellectual effort by defence planners.

These implicit theories, are obviously more difficult for external assessment. The US Army's MDO concept does effectively imply that through threatening or using pre-emptive measures, such as the long-range hypersonic weapons assigned to its Multi-Domain Task Forces, that aggression can be deterred or stopped.[109] An open discussion of how this would specifically work against Russia or China however should not be expected, again due to both classification reasons and for intra-alliance sensitivities.

The least theoretically 'testable' cases are the UK and NATO. Centred on what are essentially comprehensive approaches, it is quite difficult to make clear, causal arguments about how a whole-of-government style effort can actually lead to the deterrent or war-winning outcoming desired. This style of argumentation remains only plausible, but ultimately cannot be tested for validity as it is, in scientific terms, unfalsifiable. Who would not agree with the sentiment that better inter-agency, all of alliance coordination and action would not be more ideal? But what is missing is that causal claim, as demonstrated in the previous chapter, of how such a whole of government style approach will actually cause the defeat of a specific problem.

Naturally, any fully developed theory is imperfect. It can be tested however in joint exercises, tried in simulations, and be measured against observations from contemporary conflicts. What is important is that it is rationally argued and has a clear statement regarding cause and effect against a specific opponent and fits within policy and higher-level strategy. Importantly, an explicit theory should be open at the risks the chosen course may carry, the types of which are detailed in the following section.

106 Gros et al., "Intégration Multimilieux / Multichamps : Enjeux, Opportunités et Risques à Horizon 2035."

107 CICDE, "Concept d'emploi Des Forces."

108 Lappin, "The IDF's Momentum Plan Aims to Create a New Type of War Machine"; "Taiwan 2021 Quadrennial Defense Review."

109 McConville, "Army Multi-Domain Transformation: Ready to Win in Competition and Conflict."

4.6. **Opaque risks**

At present, none of the cases included in this report identify risks in the way described above. If risk is noted, it is only to argue the risks if the respective concept is not implemented and funded, a calculation as influenced by bureaucratic considerations as it is by threat perceptions. A key element of MDO efforts should be to clearly identify which internal risks are most applicable within their specific context and to work to mitigate them. If they cannot be mitigated, they must at least be openly acknowledged and the choice to carry it should be explicit.

There are four key risks that stem from an uncritical approach to developing MDO-type concepts: the possibility for commanders to become overloaded by an overly broad span of control; an over-reliance on connectivity; a mechanistic, overengineered approach that becomes top heavy; and an assumption that the whole is ultimately more than the sum of its parts.

A central risk to MDO in practice is the risk that commanders become overloaded by the number of tasks that coordination across domains entails. Pre-defining an exact of span of control, or the number of subordinates a commander directly manages, ahead of actual fighting is a challenge. However, doctrinal thinking generally notes that an ideal span of control is limited, particularly if a situation is changing rapidly.[110] This could notionally be solved by sufficiently balancing tasks across echelons, especially at the corps and division levels.[111] However, synchronising at any level could become a major burden. Mission command is also cited as a solution to potentially overburdened commanders, by encouraging lower-level initiative by officers and NCOs at the actual front. It has been pointed out that in practice, however, that mission command is overridden by senior commanders becoming heavily involved in tactical detail while professional military education and promotion systems promote strict (and risk averse) 'by the book' actions rather than actual low-level initiative.[112] Narrowly defining the levels of coordination commanders may be expected to undertake in an MDO concept is likely necessary, given the institutional pressures that would likely lead to a significantly expanded span of control and overload.

The second risk, a reliance on connectivity, has been explored above in the discussion on technological maturity. It is worth highlighting once more that placing network connectivity at the centre of military conceptual thinking is a high-risk endeavour in a time of widespread investments in electronic warfare. Additionally, vital networks in space are not necessarily dominated by state-provided services, but rather industry.[113] This can leave states at the whims of private actors who no longer wish to provide critical services, as seen with SpaceX's limits placed on Ukraine in its support for drone activity.[114] It is additionally risky from a multinational perspective, should some states race down the road of advanced communications interoperability would likely suffer. The hyperconnectivity envisioned by some MDO concepts is far from mature, largely outside the control of the armed forces, and quite likely vulnerable to adversary attack.

110 "Joint Doctrine Publication 5: Command and Control" (Ministry of Defence of the Netherlands, 2012), https://www.defensie.nl/downloads/publicaties/2012/03/16/joint-doctrine-publication-5-command-and-control-en.

111 Marlow and Blythe, Jr., "Multi-Domain Warfighting in NATO: The 1 German-Netherlands Corps View."

112 Travis Zahnow, "Can Mission Command Actually Work?," Modern War Institute, July 30, 2020, https://mwi.westpoint.edu/can-mission-command-actually-work/; Don Vandergriff, "The Myth of Mission Command," The Strategy Bridge, March 30, 2014, https://thestrategybridge.org/the-bridge/2014/3/30/the-myth-of-mission-command; Andrew Hill and Heath Niemi, "The Trouble with Mission Command: Flexive Command and the Future of Command and Control," *Joint Force Quarterly* 86 (Q3 2017): 94–100.

113 Bleddyn E. Bowen, *Original Sin: Power, Technology and War in Outer Space* (Oxford University Press, 2022).

114 Joey Roulette, "SpaceX Curbed Ukraine's Use of Starlink Internet for Drones -Company President," Reuters, February 9, 2023, https://www.reuters.com/business/aerospace-defense/spacex-curbed-ukraines-use-starlink-internet-drones-company-president-2023-02-09/.

A third risk, highlighted by Mattis's criticisms of EBO in the early 2000s[115], is that MDO becomes an over-engineered and crowded staff process more focused on establishing and following headquarters procedures rather than functioning as an actual warfighting concept. The synchronisation of activity frequently cited in MDO concepts implies a significant staff function that could lead to MDO becoming a top-heavy effort. In such an environment a concept becomes less a tool for the operational level to draw upon and more remains at the theoretical level. Related to the institutional reasons that prevent lower-level initiative, a staff-level MDO would also create a 'long screwdriver' that allows non-operational officers to reach directly into the planning and execution of engagements.[116]

Finally, there is the risk stemming from an assumption that MDO leads to the whole of warfighting effectiveness is naturally greater than the sum of its parts. It is hoped that by synchronising and coordinating actions across military domains that it will by virtue of that synchronisation have outsized effects. This is seen across cases in the aim to 'impose multiple dilemmas simultaneously'. However, particularly for those cases with only limited threat specificity, this remains an abstract goal. War is reciprocal, and opponents' perceptions and actions have an impact on whether the outcome actually exceeds the sum of the coordinated actions. This is particularly risky as Russia, China, Iran, and even North Korea have specifically tailored their defence 'systems' to be resilient against Western-style attempts to disrupt them.[117] Table 5 below summarises these risks and their impacts.

Table 5. Summary of MDO concept risks and possible impacts

Risk	Description	Impact
Overloading commanders	Commanders become overwhelmed by the need to coordinate too many tasks not within their normal span of control	Significant; overload risks paralysed command decisions and poor inter-government relations
Over-reliance on connectivity	Armed forces over-rely on assured connectivity when planning for and engaging in combat	Significant; the possibility that adversaries or battlefield friction can disrupt communications is a serious risk
Over-engineered, staff-heavy approach	Headquarters are too large to effectively manage and process replaces output	Significant; Western militaries have large, top-heavy staff systems that often enforce process over actual success
Over-promising	That MDO will combine domain actions to have greater impact than service-specific actions	Moderate; there is risk that MDO cannot deliver upon its promises, but this remains to be effectively tested

115 Mattis, "USJFCOM Commander's Guidance for Effects-Based Operations."

116 Kollars, "War at Information Speed: Multi-Domain Warfighting Visions."

117 James Black et al., "Multi-Domain Integration in Defence: Conceptual Approaches and Lessons from Russia, China, Iran and North Korea" (Santa Monica, CA: RAND Corporation, 2022), https://www.rand.org/pubs/research_reports/RRA528-1.html.

4.7. **Conclusion**

This chapter has summarised the key challenges MDO concepts must grapple with and summarised and categorised the various national and multinational approaches to developing MDO along six key areas. It has shown the various models by which states have pursued this development, while noting the risks of incoherency for those states that would in extremis operate in multinational formations. Intriguingly, it has shown that there is reticence to discuss how new military thinking will actually contribute to winning against a clear opponent. This risks leaving the core logic of conceptual work opaque to outside observation and less useful for academic debates about such concepts. Finally, it serves to highlight that despite years of both military and academic effort across allied states, key ideas remain highly differentiated and unclear. Table 5 below summarises the results of this analysis.

Table 6. Review summary of case study results

Cases	Clarity of Language	Regime fit	Technological maturity	Threat Description	Theory of Success	Risks
Denmark Multi-Domain Operations	No set definition, but the adoption of the NATO MDO definition is a positive sign for multinational understanding.	Unable to determine definitively.	Highly technologically mature, but very limited independent capacity.	Unable to determine yet.	Unable to determine yet.	Unable to determine yet.
France Multimilieux/ Multichamps (M2MC)	Clear language, but developed independent of other approaches.	Strong political-military and inter-service fit, possible weak intra-alliance fit	Highly technologically capable with sufficient capacity.	Unclear threat description.	No clear theory of success.	No internal risks identified.
Germany Multi-Domain Operations	No set definition, but the adoption of the NATO MDO definition is a positive sign for multinational understanding.	Strong political-military fit, unclear inter-service and intra-alliance fit.	Highly technologically mature, but very limited independent capacity.	Explicit threat description, but could change.	Implicit theory	No internal risks identified.
Israel Multi-Domain Manoeuvre	Unclear language, 'multi-domain' takes on multiple meanings.	Strong political-military and inter-service fit, possible intra-service friction within the Ground Forces.	Highly technologically mature with significant capacity.	Very clear threat description; Third Lebanese War scenario	Specific theory; pre-emptive destruction of Hezbollah positions through fires	No internal risks identified.
NATO Alliance Approach to MDO	Clear language agreed by NATO allies, but not all allies are adopting this definition.	Unclear political-military and inter-service fit.	Highly technologically mature, but differentiated across allies.	Clear threats, Russia and terrorism, but not detailed publicly.	No clear theory of success.	No internal risks identified.
Taiwan Multi-Domain Deterrence	Clear language, but developed independent of other approaches.	Strong political-military fit, unclear inter-service and multinational fit.	Technologically advanced, but limited capacity without outside support.	Very clear threat description; PRC amphibious invasion scenario	Specific theory; pre-emptive destruction of PRC amphibious capabilities before they cross the strait.	No internal risks identified.
UK Multi-Domain Integration	Unclear language, key terms remain vague.	Weak political-military regime fit, strong inter-service fit, unclear intra-alliance fit.	Highly technologically capable with limited capacities.	Unclear threat description.	No clear theory of success.	No internal risks identified.
US Multi-Domain Operations	Clear language, but developed independent of other approaches.	Unclear political-military fit, weak inter-service fit, possible weak intra-alliance fit.	Highly technologically capable with significant capacity.	Clear threat descriptions, but very broad and not detailed publicly.	Implicit theory of success.	No internal risks identified.

5. Conclusions & Recommendations

What conclusions can be drawn from both the history and current state of international military concept development as it applies to MDO? Returning to the key themes identified in chapter four, we can start to formulate a useful answer.

The overarching conclusion of this report is that, across cases, MDO risks remaining a fashionable idea that is not implemented at scale. While some efforts at force transformation and capability development have been initiated, it has not been made sufficiently clear how these concepts will lead to success in a contemporary conflict. The why and how of MDO simply does not have clear or entirely convincing arguments. This is not to say it is impossible to improve going forward, however the current trajectory is risking the worst patterns of post-RMA concept development work. To take serious steps forward, the following challenges will need to be addressed.

MDO risks remaining a fashionable idea that is not implemented at scale.

Firstly, whether current efforts worsen or improve 'Babylonian confusion'. Arguably, most national efforts to develop MDO have only worsened this tendency. This is a natural byproduct of these efforts. Each new concept introduces new terms and as it is implemented its ideas and language are interpreted differently across services and different levels of the armed forces. As seen in the five-decade evolution of warfighting concepts, this has been prevalent for some time. NATO can be singled out and commended for its efforts to develop an alliance-wide approach to MDO, which can act as a common reference for 31 (soon 32) countries. A real risk however is that national approaches contradict what is agreed in NATO. The core finding then, is that greater alignment is needed and continued effort to achieve this will be vital for conceptual clarity into the future.

Secondly, whether MDO concepts are sufficiently fit for their respective regime. Most concepts do take adequate care to fit within a given political-military structure, though the UK stands out in this regard and its MDI concept has received pushback from both the FCDO and Parliament. Inter-service rivalry, particularly between air and land forces, is a perennial problem for MDO. The strongest case has been in the US, wherein the Army and Air Force have developed competing approaches over the years and the Navy and Marine Corps have divested themselves from this rivalry. Other states, namely Israel, face a different issue in which rivalry occurs between different branches of the ground forces, in this case the airborne and armoured corps. Finally, most MDO concepts have considered the role of the right echelon for MDO command and control, though there are not common answers. They range from the battalion (Denmark) to the theatre levels (US). Some land forces have identified either the division or the corps level as the right place for MDO coordination to occur however (France, Germany, Israel, UK). The main finding here is that MDO concepts must address regime fit head on, and explicitly address political-military and inter-service dynamics. Within services, assigning the right echelon (Corps, Division, Brigade, etc.) is of equal importance. For the Netherlands in particular, this means a development and conceptualisation of MDO alongside German efforts and within the context of German-Dutch land force integration.

Thirdly, whether concepts are realistic about the maturity of the technology upon which they are based. This is almost universally not the case, as nearly all cases assume a high level of

assured communications connectivity which does not yet exist. The German and US cases are investing heavily into this connectivity, however there is a risk of becoming overly reliant on assured communications in the event of a conflict. Other areas, such as sensing and long-range precision strike systems, are much more mature and provide for a sound technological element in concepts, which feature prominently in the Israeli, Taiwanese, and US cases. Most importantly, technology should not be considered a panacea that can rectify a lack of mass on the battlefield, particularly as shortfalls continue amongst European states. For the Netherlands, this is especially true as its latest Defence Planning Capability Review for NATO noted that its heavy and medium brigades lack sufficiently manned battalions.[118] The core finding here is that MDO concepts are highly reliant on immature C3I capabilities, though does have a firmer grounding in existing long-range strike and ISR systems.

Fourthly, whether MDO concepts are sufficiently threat specific. Most of those included in this study are not, most likely due to both security restrictions or wanting to ensure flexibility across global interests. Taiwan and Israel are the clearest, which is not surprising given their respective security environments and histories. Most others make general reference to 'peer-state actors', or do make direct reference to Russia or China, but do not take the extra step to explicitly identify how those states' armed forces pose threats to the current way of warf-ighting. The core finding is that threat descriptions must be specific and detailed to the actual attributes of an opponent's armed forces.

Fifthly, whether concepts include a theory of success that includes defeat mechanisms. Five of the eight cases included here only have implicit theories at best, with some being less opaque than others. France has a clear aim to disintegrate the armed forces of its opponents by preventing their various units from being able to coordinate. Both Taiwan and Israel have the clearest theories with explicit mechanisms, both effectively being the pre-emptive and rapid destruction of enemy forces before they can cohere and strike, an understandable approach given their inability to trade any space for time. Those cases with only implicit theo-ries (Denmark, Germany, NATO, the UK, and the US) risk being overly vague in their specific applications, which in turn can limit their overall impact on future force designs or broader DOTMLPF-I developments. The core finding here is a theory of success, or a causal argument as to why a new concept will actually lead to a desired result, is central to development efforts. The aim of the theory is to be testable in exercises, wargames, and experimentation.

Finally, whether concepts adequately take stock of the risks their implementation would carry. Based on the open sources and field work conducted in the context of this study, the answer appears to be no. Each case makes optimistic arguments as to how the respective concept can function, though the trade-offs apparent in each remain hidden. It is quite likely that this clarity on risk remains covered under layers of classification, however, openness about this risk is ultimately vital for inter-service communication, multinational planning, and even for legisla-tive awareness. The core finding in this is that new warfighting concepts must be up front with their consumers with regard to what choices and trade-offs have been made in their develop-ment. To do otherwise risks either faulty implementation or unwarranted overconfidence.

What does all of this mean for states, particularly for small and middle powers, that are either in the nascent stages of MDO concept development or are considering embarking on such an effort? The following recommendations move from the general to the specific, and offer steps that can be taken amongst ministries and armed forces' staffs in the short- to medium-term.

118 "NATO Defence Planning Capability Review 2021/2022" (Rijksoverheid, October 7, 2022), https://open.overheid.nl/documenten/ronl-03ef340c071e05b8f70b1dd450a4a6e0e74859b1/pdf.

Recommendations

1. NATO states' concepts are not sufficiently specific about threats or are limited to specific scenarios

1.1. In MDO 'sub-concepts' articulate a clear threat definition that includes how a specific opponent's armed forces pose specific problems

1.2. Resist the temptation to only focus on Russia in overarching concepts (or any single state-based threat), but connect to sub-concepts

2. Theories of success are only marginally thought through by army planners and defeat mechanisms are opaque

2.1. Task strategists to develop theories of success with clear defeat mechanisms for a range of conflict scenarios

2.2. Create wargames, simulations, and exercises at national and international level which incorporate a feedback loop

3. There is a need for greater alignment within NATO and within allies' land forces on terms and core ideas

3.1. Continue to align efforts through NATO processes and procedures and incorporate into national efforts

4. Concepts are not sufficiently digestible at the political-military and inter-service levels or within army structures

4.1. Task concept developers to explicitly include references to political control of the use of force in warfighting concepts

4.2. Task concept developers to utilise joint efforts and make direct reference to other service concepts where applicable (e.g., on definitions and threat descriptions)

4.3. Task concept developers to study in-depth the correct land force echelon to coordinate MDO efforts, with a special focus on the Division and Corps levels

5. Concepts are overly-reliant on immature technology that does not yet exist within most allied land forces

5.1. Create roadmaps for technology maturity, with direct links to force mixtures and cost estimates

5.2. Recognise both capability (is the technology mature?) and capacity (how much can we get of it at reasonable cost?)

5.3. Wargame technology mixes in different scenarios (near peer, non-peer; low bandwidth / high bandwidth)

6. Concepts are not sufficiently transparent about the four risks carried within them

6.1. Insert mitigation strategies to the four risks in Table 2; if unavoidable, be clear that it is inherent to following the concept

7. Evolution of MDO continues, but there are doubts about the concept's durability in the US

7.1. Be wary about connecting too directly with legacy US conceptual development efforts

7.2. Strengthen awareness and understanding of US concept development and intra-service struggles

6. Annexes: Country Case Studies

6.1. Annex A: Denmark – A concept in progress

6.1.1. Overview

While Denmark has not yet developed a full-fledged concept, significant intellectual effort has been invested to better grasp the challenges that MDO poses for small states. The Danish Defence Command has also identified that it will adopt NATO terminology regarding MDO. The Royal Danish Defence Academy is leading the conceptual effort, which is heavily focused on professional military education (PME) and building an MDO mindset across all of the armed forces.

6.1.2. Regime Model

The Danish regime model has notionally been identified as balanced across the two axes, though until further detail is available this cannot yet be refined.

6.1.3. Specific actionable steps taken in implementation

Danish Defence Command has already identified that both the Danish Acquisition and Logistics Organization and the Royal Danish Defence Academy have begun preparatory work on what prerequisites from both a procurement and education perspective will need to be in place for MDO to be integrated effectively. A series of studies was conducted in 2022 on a variety of MDO related issues including separating MDO from joint operations, the contribution of IAMD, space, and the tactical and doctrinal implications of MDO.

Additionally, Denmark's preliminary work has identified a number of challenges related to MDO from a small state's perspective. These considerations have direct bearing on the research within this report. They are:

- Common NATO concepts and technologies have still not matured to a point where they can be transformed into more tangible initiatives and procurements to support the ability to conduct MDO;
- Understanding at what level MDO will be enacted;

- Developing and maintaining the digitization and datafication prerequisites for interoperability between services, domains and alliance partners;
- Data security, including vulnerabilities to electronic attack and exploitation;
- Limited capability and resources in the cyber and space domains for small states;
- There is a lack of understanding regarding the role of small states in an MDO environment.

6.1.4. Theory of Success

Without a fully detailed concept, it cannot be fully assessed to what degree a theory of success may be developing. Given its geographical position and its role in NATO's enhanced forward presence in both Estonia and Latvia, a reasonable assumption can be made however that arguments will be tailored to address the challenges faced on the alliance's eastern flank.

6.2. Annex B: France – Intégration multimilieux / multichamps (M2MC)

6.2.1. Overview

The *Concept d'emploi des forces* developed by the joint Centre interarmées de concepts, de doctrines et d'éxpérimentations (CICDE) of the General Staff is the current French effort to conceptualise what it refers to as 'integration multimilieux / multichamps' (M2MC). The concept is solely focused on the development of military means and it is largely focused on guiding organisational development in such a way as to better leverage cross-service actions for cumulative effect. It includes detailed consideration of each domains specific requirements, to include the land forces. Though ostensibly centred on 'high-intensity' warfare[119], exercises on the concept include a role for the French Army as part of a wider government, interagency process in some hybrid scenarios.[120] Within this context, the concept stresses the importance of interoperability with allies and partners as a basis for planning.[121]

6.2.2. Regime Model

The French approach is a military-only type which stresses organisational and C2 changes that included non-domain specific components to coordinate across domains.[122] Accordingly, it is balanced between the organisational and technological focus, and does not exclude detailed technological considerations across all domains, with a full explanation provided for each service.

119 Elise Vincent and Cedric Pietralunga, "The French Army Is Preparing for High-Intensity War," *Le Monde*, November 16, 2022, https://www.lemonde.fr/en/international/article/2022/11/16/the-french-army-is-preparing-for-high-intensity-war_6004499_4.html.

120 ORION 2023 exercise

121 CICDE, "Concept d'emploi Des Forces," 30.

122 Gros et al., "Intégration Multimilieux / Multichamps : Enjeux, Opportunités et Risques à Horizon 2035," 119.

6.2.3. Specific actionable steps taken in implementation

While there is not an identifiable MDO-specific investment plan or coordinating office, the General Staff has taken steps to implement a new C2 model that is centred on Joint Force Functional Component Commanders (JFFCCs) who have the necessary assets from all five domains to perform a given mission.[123] It is not immediately clear how this new function would interact with existing service commands, though emphasis is seemingly placed on the better coordination of Air-Land functions such as close air support (CAS) and the suppression of enemy air defences (SEAD).[124] The army will also be creating a Combat Futures command, which will aim to improve procurement. Finally, capability specific investments are being prioritised into a reinforced UAV fleet, investments into deep fires and artillery modernisation, and a new collaborative communications system named 'SICS', likely to build on the previous 'Scorpion' modernisation programme.[125]

6.2.4. Theory of Success

The French approach does make specific reference to a defeat mechanism, namely, "creating and exploiting operational dilemmas that contribute to the disintegration and disarticulation of the adversary."[126] This is then reminiscent of RMA-era thinking related to paralysing an enemy's military system. It is perhaps a less than ideal description as it does not include reference to war's interactive nature, the likely ability of adversaries to absorb a first major shock, and a non-scalable approach that leaves civilian decision-makers with few options beyond the use of major force.

6.3. Annex C: Germany – Multi-Domain Operations

6.3.1. Overview

While there is not yet a single, distinct MDO concept for the German armed forces, the Planungsamt (Planning Office) of the Bundeswehr is leading a centralised effort at such development. Planning efforts have also been closely tied to the ongoing development of the NATO Alliance Concept for MDO. Service-level efforts are also ongoing in a more limited manner and will be revisited once the finalised joint MDO concept is delivered in summer 2024.[127]

Current approaches are limited to military activities, but ongoing work does not exclude connections to other instruments of power, with MDO 'embedded' within broader efforts. The German concept is clear in stressing both the centrality of NATO to its approach as

123 Gros et al., 130.

124 Gros et al., 122–27.

125 Lt. Gen. Bertrand Toujouse, "French Land Forces Chief: How France's Army Is Transforming for the Modern Era," Breaking Defense, May 25, 2023, https://breakingdefense.com/2023/05/french-army-chief-how-frances-army-is-transforming-for-the-modern-era/.

126 Gros et al., "Intégration Multimilieux / Multichamps : Enjeux, Opportunités et Risques à Horizon 2035," 99.

127 "Multi-Domain Operations in Land Forces Workshop" (Strausberg: Kommando Heer, May 9, 2023).

well as noting that "politics will remain the ultimate authority for all military activities."[128] German concept developers are also clear in the balance between organisational and technological factors.

6.3.2. **Regime Model**

The German approach is currently a military-only type which stresses organisational changes to adapt processes and procedures as well as emphasise the 'human factor'.[129] It does note, however, that the technical challenges in MDO are 'huge' and will be important for ensuring allied interoperability, particularly with US C3 systems. Accordingly, it is balanced between the organisational and technological focus, with the technological emphasis stressing investments that can enable decentralised C2 at the operational and tactical levels.

6.3.3. **Specific actionable steps taken in implementation**

While there is not yet an MDO-specific investment plan (forthcoming 2024), developers have focused their efforts at the tactical level and to ensure coherency with NATO's MDO approach. Steps have been taken land doctrine development, with the service ensuring that NATO's approach is appropriately integrated into German doctrine. Additionally, several concrete capability investment recommendations have been developed: Digitisation of Land-Based Operations; Tactical Wide Area Network; German Mission Network; IT Cluster Framework; and Joint fires optimisation. Additionally, experimentation has been ongoing in Medium Forces development, Military IoT for Tactical Reconnaissance, and Air Combat Management. Finally, 103 MDO elements have been identified in exercises undertaken across all services.[130]

6.3.4. **Theory of Success**

The German approach does make specific reference to a defeat mechanism, namely, "to overpower the adversary's OODA-loop and present him with several dilemmas which forces him on the defensive and finally into defeat."[131] This thinking has been developed with the particular threat of Russia against Lithuania (where Germany serves as the lead NATO Enhanced Forward Presence nation) and the ability of Germany to reinforce Lithuania through Poland while fighting through the A2/AD challenge presented by the Kaliningrad exclave.[132]

128 "Multi-National Capability Development Campaign - Multi-Domain Multi-National Understanding Report Annex A," 10.

129 "Multi-National Capability Development Campaign - Multi-Domain Multi-National Understanding Report Annex A," 11.

130 "Multi-Domain Operations in Land Forces Workshop."

131 "Multi-National Capability Development Campaign - Multi-Domain Multi-National Understanding Report Annex A," 11.

132 Mais, "Mittlere Kräfte - Operative Reaktionsfähigkeit Und Motor Der Modernisierung."

6.4. Annex D: Israel – Operational Concept for Victory

6.4.1. Overview

In the Israeli Defense Forces, the concept of MDO is part the theoretical framework 'Operational Concept for Victory', led by the Chief of the General Staff Major General Aviv Kochavi. This is only the conceptual element of the broader Momentum Multiyear Plan' ('Tnufa') begun in 2019. Led by the General Staff, it is an IDF-wide approach rather than service specific.[133]

The effort is centred on what the IDF has identified as the core security challenge for Israel: non-state threats emanating from groups such as Hezbollah and Hamas, particularly their growing missile capabilities.[134] State threats including Iran certainly feature prominently in strategic thought. Importantly, Israeli defence efforts have, are, and will almost certainly continue to be centred on independent national actions. This has been particularly focused on the perception of a growing likelihood of a Third Lebanon War, which would see a serious commitment of IDF Ground Forces into southern Lebanon.

6.4.2. Regime Model

The IDF approach is military only with an organisational focus, particularly in land-force unit type experimentation and in cross-service C2. 'Whole of government' or 'comprehensive approach' style language does not appear. While the integration of new technologies does feature in the approach, it is not considered to be a driving factor.

6.4.3. Specific actionable steps taken in implementation

As part of the overall Momentum Multiyear Plan, a number of steps have been taken in support of the new operational concept. In capabilities, a Digital Transformation Directorate has been established that is responsible for the development of digital infrastructure that enables assets from all five domains to communicate among each other. Improvements in UAVs and in advanced battle tanks have been stressed as well as part of the broader modernisation effort.[135] Additionally, a Joint Fires Array has been established at the General Staff level that aims to coordinate higher-echelon effects (e.g. cyber). This culminates into what is a referred to as an 'exposure concept' that can rapidly identify and engage targets.

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133 Eran Ortal, "Going on the Attack: The Theoretical Foundation of the Israel Defense Forces' Momentum Plan (1)," IDF, October 1, 2020, https://www.idf.il/en/mini-sites/dado-center/vol-28-30-military-superiority-and-the-momentum-multi-year-plan/going-on-the-attack-the-theoretical-foundation-of-the-israel-defense-forces-momentum-plan-1/.

134 Aviv Kochavi, "The Chief of Staff's Introduction - הקדמת הרמטכ"ל," in עליונות צבאית ותר"ש "תנופה" (Dado center ofr Interdiciplinary Military studies, 2020), 7–10, https://www.idf.il/media/5hqfcjxm/%D7%91%D7%99%D7%9F-%D7%94%D7%A7%D7%98%D7%91%D7%99%D7%9D-%D7%A2%D7%9C%D7%99%D7%95%D7%A0%D7%95%D7%AA-%D7%A7%D7%95%D7%91%D7%A5-%D7%A1%D7%95%D7%A4%D7%99-%D7%9C%D7%90%D7%AA%D7%A8.pdf.

135 Lappin, "The IDF's Momentum Plan Aims to Create a New Type of War Machine."

Organisationally, Unit 888 "Refaim"("Ghosts") has been established as a 'multi-domain unit' that consists of 'infantry, engineering, anti-tank, artillery, intelligence and air capabilities and fighters and will form a multi-armed maneuvering body'.[136] Understood as a special operations force, it is ultimately under the command of the Ground Forces. This new unit is part of a broader land force reorganisation that is transitioning division and corps level structures in such a way as to command assets across domains. This unit has been frequently drilled. Finally, in the beginning of 2022 the IDF General Staff organised a 'war month' to exercise and experiment within the new operational concept and with new units.[137]

6.4.4. **Theory of Success**

The Momentum effort is notable in its particular effort in experimenting with and redefining what victory means for the IDF. This was the primary intellectual effort in the efforts to develop the operational concept for victory. It has explicitly identified a focus on the rapid destruction of enemy capabilities, with a particular aim on achieving victory in as short a time as possible. Using manouevre to ensure rapid destruction of enemy capabilities is reminiscent of EBO's focus on precision weapons, however this land forces-centric concept centralises organisational change as the means for success rather than new weapons systems. As noted, this is envisaged within the context of a new war in southern Lebanon.

6.5. **Annex E: NATO– Alliance Concept for Multi-Domain Operations**

6.5.1. **Overview**

The Alliance Concept for MDO, developed by Headquarters Supreme Allied Commander, Transformation (HQ SACT) aims to 'provide MDO principles to guide further development of the Alliance Military Instrument of Power (MIoP)'. This aim, along with its development by HQ SACT provides less a guide for MDO for the armed forces but more a rationale for an MDO approach within the alliance and how NATO institutions can support it. Additionally, it highlights that the higher-level documents the NATO Warfighting Capstone Concept (NWCC) and the Concept for the Deterrence and Defence of the Euro-Atlantic Area (DDA) do provide such guidance, though the details of which remains classified.

6.5.2. **Regime Model**

The NATO approach to MDO is a comprehensive and technologically-focused concept. It emphasises the synchronisation of military action with other instruments of power while stressing the centrality of 'digital transformation' for the alliance. NATO's definition describes MDO as "the orchestration of military activities, across all domains and environments, synchronised with non-military activities, to enable the Alliance to create converging effects at

136 Gross, "In 1st Drill, IDF's Ghost Unit Tests out New Tactics with Jets, Tanks and Robots."

137 Gal Perl Finkel, "'War Month': A Test of the IDF's Operational Concept and a Dress Rehearsal for the Next War," *The Institute for National Security Studies* (blog), April 25, 2021, https://www.inss.org.il/publication/war-month/.

the speed of relevance." The enablers it identifies are data, technological advantage, multi-domain C2, 'right people, right skills', and collective training.

6.5.3. Specific actionable steps taken in implementation

The implementation of MDO in NATO is seen across a variety of areas. The concept has influenced elements of doctrinal development, particularly Allied Joint Doctrine (AJP-1), while also leveraging the implementation efforts of the alliance's Warfare Development Agenda (an agreed path that informs both collective and national defence planning). These include, among others, a Data Exploitation Programme, Integrated Multi-Domain Architecture, and the Future Multi-Domain Warfighter Initiative.

MDO development is occurring elsewhere in the alliance, however, with the strategic, operational, and higher-tactical level commands lending their perspectives. SHAPE, through its development of the Concept for the Deterrence and Defence of the Euro-Atlantic Area (DDA) has contributed to the strategic-level effort, particularly in its transition to become NATO's 'strategic warfighting HQ' (SWHQ). Joint Force Command – Brunssum, the Allied Rapid Reaction Corps (ARRC), and the NATO Rapid Deployable Corps – Spain (NRDC-ESP) have also shown signs of grappling with the intellectual challenge MDO poses for commanders.

6.5.4. Theory of Success

Achieving an alliance-wide, agreed description for a theory of success would be very difficult politically. NATO, being a consensus organisation, will struggle to institutionally digest a single theory. Importantly, NATO would be reticent about telling individual allies how to employ nationally-owned forces. Additionally, as a development-focused concept it does not prescribe actions the military can take that would seek to achieve certain effects.

Nonetheless, military-strategic thought has progressed to stress taking actions across the five operational domains that can achieves effects across the cognitive, virtual, and physical dimensions. These actions and effects would be undertaken with the logic of either "shaping, contesting, or fighting", possibly simultaneously. Simultaneous effects coordination does lay some ground for a theory that can be tested and improved over time.

6.6. Annex F: Taiwan – Multi-Domain Deterrence

6.6.1. Overview

The overall military strategy for the Taiwanese armed forces is coined "resolute defence and multi-domain deterrence," which conceptually has developed into an "all out defence" approach that merges operations across the three conventional domains into a total defence concept that envisions not only a whole of government style effort but rather a whole of society defence. Naturally, this is understood in the context of a major attack undertaken by China. The multi-domain deterrence element is centred on the procurement/development

of long-range strike, new fighter aircraft, missile defence, anti-ship missiles, tanks, electronic warfare/cyber, and joint command and control and ISR. Importantly, this approach since 2021 moves beyond a 'hedgehog' style defence and envisions strikes against the mainland to prevent the concentration of forces before they embark.[138] This adaptation has initiated debate in Washington about what this means for a potential US involvement in Taiwan's defence.[139]

6.6.2. **Regime model**

The Taiwanese approach is a paradigmatic comprehensive approach merged with a focus on technological procurement. It has clearly identified a list of procurement priorities that will enable the multi-domain deterrence concept. It has also clearly developed, at least in theory, a total defence concept that closely involves not only political but also wider civil society elements.

6.6.3. **Specific actionable steps taken in implementation**

Taiwan has allocated funding for the acquisition of HIMARS, ATACMS, SRBMs and precision-guided rockets in its defence budget. This indicates a step towards implementing the multi-domain deterrence concept. The US has also created a dedicated programme to enhance Taiwan's cyber capabilities.[140]

6.6.4. **Theory of Success**

Taiwan's theory of success is straightforward, unsurprising given the clarity of the threat it faces. To prevent the consolidation of force on the Chinese mainland, to destroy as many landing ships at sea, and if they should land defeat them before a beachhead is established. This is seemingly applicable to an attempted full-scale invasion scenario as well as a blockade. Put in theoretical terms, if Taiwan fully adopts and implements the multi-domain deterrence approach, then it can dissuade a Chinese attack, because Taiwan can credibly demonstrate the ability to repel even a full-scale conventional attack. This is essentially a falsifiable proposition that can be tested in experimentation and high-level exercises.

138 "Taiwan 2021 Quadrennial Defense Review"; "Taiwan National Defense Report 2021."

139 Michael A. Hunzeker, "Taiwan's Defense Plans Are Going Off the Rails," War on the Rocks, November 18, 2021, https://warontherocks.com/2021/11/taiwans-defense-plans-are-going-off-the-rails/; Raymond Kuo, "The Counter-Intuitive Sensibility of Taiwan's New Defense Strategy," War on the Rocks, December 6, 2021, https://warontherocks.com/2021/12/the-counter-intuitive-sensibility-of-taiwans-new-defense-strategy/.

140 "Chapter Six: Asia," *Military Balance 2023* 123, no. 1 (2023): 208–301.

6.7. Annex G: United Kingdom – Multi-Domain Integration

6.7.1. Overview

Developed in 2020 by the Development, Concepts and Doctrine Centre (DCDC), a subcomponent of UK Strategic Command, the concept of Multi-Domain Integration (MDI) aims to operationalise the Integrated Operating Concept 2025 (IoPC), another MoD concept. The IoPC lays out an approach centred on 'integrating for advantage', which discusses integration across military domains, across the UK government, and with allies.[141] Both the IoPC and MDI are undertaken under the strategic context of what they refer to as competition, and is argued to be applicable in 'below the threshold' contexts as well. This is primarily driven by the 2021 Integrated Review of Security, Defence, Development and Foreign Policy, and the subsequent 2023 'refresh' of the same review, both of which stress the importance of global competition.[142] Interestingly, however, the 2023 refresh gives much less attention to the IoPC though maintains the language and logic of MDI.

6.7.2. Regime Model

MDI is perhaps the ideal-type case for a comprehensive MDO approach. It proposes what it refers to as 'fusion' across government services and military domains, primarily with the recognition that the space and cyber domains are not actually dominated by the armed services as are the traditional air, sea, and land arms.[143] Detail on precisely how these 'fusion' and 'integration' approaches is relatively light. This comprehensiveness is complemented by an equal focus on new technologies, including AI, unmanned systems, hypersonic weapons, and space capabilities.

6.7.3. Specific actionable steps taken in implementation

MDI implementation is centred on the Multi-Domain Change Programme, an MoD led effort to inject MDI thinking across the armed forces. Focused on professional military education (PME), it includes new modules at the Defence Academy which includes the questions, "How could Command and Control in the information age be conducted differently? What can we learn from the crisis in Ukraine and how do our adversaries perceive a NATO response in an MDI/MDO context? How can we promote a more integrated culture across all government departments?" Additionally, the director of capability and multi domain Integration (MDI) at UK Strategic Command, Major General Robin Anderton-Brown, described MDI "as being more about the culture and behaviours. There is a risk it is seen in Defence terms as an 'equipment programme' – which it absolutely isn't."

141 Ministry of Defence, "Integrated Operating Concept 2025" (Ministry of Defence, August 2021), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1014659/Integrated_Operating_Concept_2025.pdf.

142 "The Integrated Review 2021," GOV.UK, July 2, 2021, https://www.gov.uk/government/collections/the-integrated-review-2021; "Integrated Review Refresh 2023: Responding to a More Contested and Volatile World," GOV.UK, May 16, 2023, https://www.gov.uk/government/publications/integrated-review-refresh-2023-responding-to-a-more-contested-and-volatile-world.

143 Ministry of Defence, "Joint Concept Note 1/20, Multi-Domain Integration."

6.7.4. **Theory of Success**

Similar to other concepts, MDI argues that it will achieve "physical, virtual or cognitive effect... or overwhelms the adversary by creating dilemmas, which weakens will and cohesion, thereby altering perceptions, beliefs and behaviours."[144] While seemingly clear in intent, this does not necessarily include a particular theory of success that describes exactly how integration across domains, government, and with allies will achieve these effects. Importantly, these efforts at integration appear to have confused rather than clarified MDI's intent across the UK government, with a parliamentary report noting that "...there is no Government definition of integration in any of the IR papers. General Everard suggested that even in terms of military multi-domain integration, there was no common understanding of what it is..."[145] While strong in advocacy, the concept lacks a causal logic in relation to specific challenges the armed forces face.

6.8. **Annex H: United States– US Army Multi-Domain Operations**

6.8.1. **Overview**

Identifying a singular, explicit MDO approach for the US writ large is made difficult by the competing service approaches to the conceptual trend. The Air Force and Army have each had their own conceptual enterprises, while the Navy has developed a separate approach centred on 'distributed' operations. This study has focused on the US Army concept for Multi-Domain Operations first described in 2018 and further described by Army Chief of Staff General James McConville in 2021.[146] There is evidence that the Army is already moving beyond MDO, with Army Futures Command now leading a new operating concept development effort.[147]

6.8.2. **Regime Model**

The US Army concept, summarised in the document "Army Multi-Domain Transformation Ready to Win in Competition and Conflict", is in effect a comprehensive-minded concept that is balanced across technological procurement and organizational change. The emphasis on the applicability of the approach across a 'competition-crisis-conflict' spectrum and the leveraging of 'an array of capabilities to operate in the information space and ensure that the nation can consistently win with the truth,'[148] implies an Army organisation closely coordinating with non-military instruments of government. In its description of change, it emphasizes both

144 Ministry of Defence.

145 "The Integrated Review, Defence in a Competitive Age and the Defence and Security Industrial Strategy - Defence Committee," UK Parliament, July 28, 2022, https://publications.parliament.uk/pa/cm5803/cmselect/cmdfence/180/report.html.

146 McConville, "Army Multi-Domain Transformation: Ready to Win in Competition and Conflict."

147 Jen Judson, "Army Futures Command Drafting next Operating Concept," Defense News, July 31, 2023, https://www.defensenews.com/land/2023/07/31/army-futures-command-drafting-next-operating-concept/.

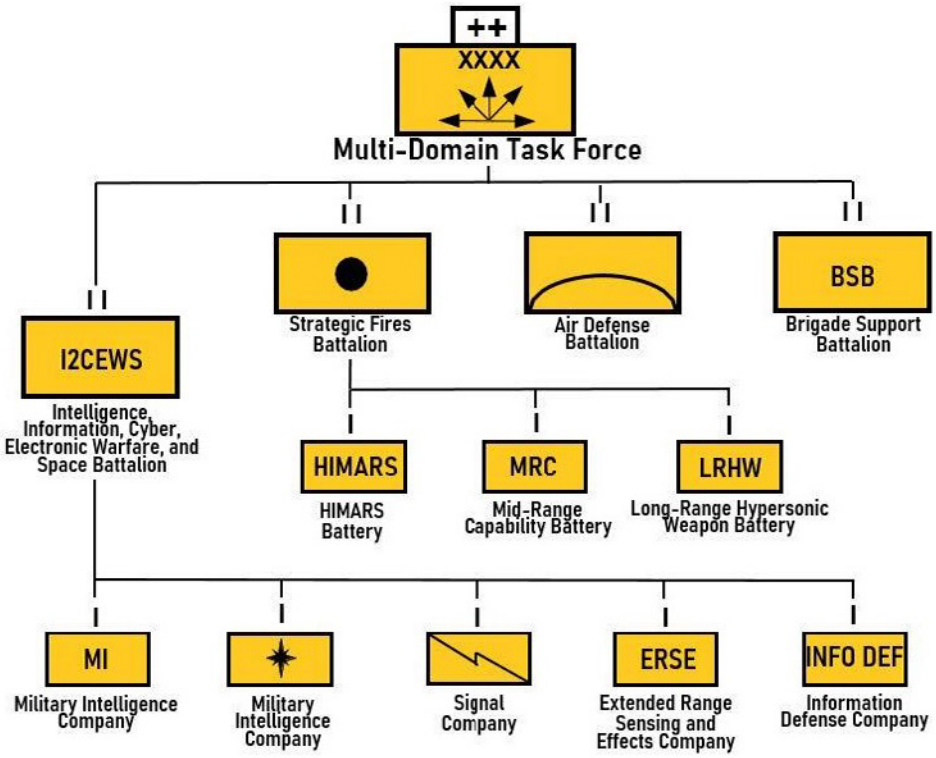
148 McConville, "Army Multi-Domain Transformation: Ready to Win in Competition and Conflict."

technological development (e.g. long-range precision fires, network modernization) and institutional change (e.g. adapted Corps/Division level HQs).

6.8.3. **Specific actionable steps taken in implementation**

The US Army's approach to implementing MDO is centred on the Multi-Domain Task Force (MDTF) and the Global Landpower Network (GLN). The US Army is experimenting with new MDTF units stationed in Europe and the Pacific with the logic that forward-deployed MDTF's within an adversaries A2/AD complex offers significant benefits in a potential conflict and thereby enhances deterrence.[149] These units are theatre-level assets that would be provided by at least a Corps-level commander Wargames conducted by RAND appear to have validated this approach to some degree, if only in the Indo-Pacific context.[150] Importantly, these units are and will be equipped with the Long-Range Hypersonic Weapon (LRHW) missile system, implying an approach centred on forward deployments on allied territories that would enable strikes on targets inside Russia and China.[151]

Figure 3. US Army Multi-Domain Task Force



149 McConville.

150 Jonathan P. Wong et al., "New Directions for Projecting Land Power in the Indo-Pacific: Contexts, Constraints, and Concepts" (Santa Monica, CA: RAND Corporation, December 20, 2022), https://www.rand.org/pubs/research_reports/RRA1672-1.html.

151 Andrew Feickert, "Defense Primer: Army Multi-Domain Operations (MDO)" (Washington, D.C.: Congressional Research Service, November 21, 2022), https://sgp.fas.org/crs/natsec/IF11409.pdf.

6.8.4. **Theory of Success**

Considerations on this appear vague across the variety of public documents. The applicability of MDO across a spectrum of action implies a certain ambiguity about what actually constitutes a new behaviour driven by MDO or is part of existing deterrence posture management or operational thinking. For example, the statement that through MDO 'The enemy's will to resist is overmatched using simultaneous maneuver, fires, and information employed from mobile operational attack positions,' is not distinctly new or necessarily helpful, as overmatching will is not a reliably testable function of success. Finally, the concept is subordinate to a wide number of joint concepts that govern everything from 'warfighting', 'competing', and 'joint operations'. In practice however, reading between the lines implies a theory of success that includes a mechanism to pre-emptively destroy Chinese or Russian capabilities early in a conflict.

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