



Integration is the New Black: Thoughts on Future Warfare in Academic and Military Discourses

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ABSTRACT

Western military policy-formation and doctrine seems to be gravitating towards the idea of integration, reflected in concepts such as *integrated campaigning*, *Integrated Operating Concept*, and *Multi-Domain Integration* – among others. Despite the increasing use of the term within military doctrines and concept papers, there is little scholarly writing on what “integration” actually means. This study contributes to the small but growing body of research on joint operations with a novel analysis on how the term “integration,” and its sister term “interoperability,” are used within academic and military discourses. The results show that the terms are given different meanings both across and within discourses. It can be deduced that “integration” is generally understood as the merging of domains and services towards joint goals while “interoperability” is often presented as the ability to combine systems, forces, and planning across services. These findings are used to create a conceptual model which distinguishes between operability, interoperability, and integration as preconditions for the conduct of joint operations. The model is in turn useful for both scholars and practitioners when discussing or assessing capabilities to perform joint operations.

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INTRODUCTION

Despite difficulties in predicting the future of warfare, armed forces are constantly preparing themselves for the next conflict by adapting their organizations, acquiring new equipment, and producing novel warfighting concepts (Freedman, 2017). During the 1990s and early 2000s, conceptual discussion on a revolution in military affairs (RMA) were dominant amongst Western militaries (Adamsky, 2010; Jensen, 2018). This was followed by a focus on counterinsurgency (COIN) during the Afghanistan and Iraq era (Bell, 2018; Etzioni, 2015). As focus shifted from fighting insurgents towards the idea of fighting peer or near-peer adversaries, Western military ambitions seem to be gravitating towards the idea of integration, reflected in concepts and doctrines such as *integrated campaigning* (U.S. Department of Defense, 2018), *Integrated Operating Concept* (UK Ministry of Defence, 2021) and *multi-domain integration* (Black et al., 2022). It should be noted that this is not a uniquely Western trend: China is developing its concept of *integrated strategic deterrence* (Chase & Chan, 2016) while India's Cold Start doctrine uses the *integrated battle group* concept as a core component (Kajal, 2022).

Yet, despite increasing emphasis on integration within doctrines and concept papers, there is little scholarly writing on the term – which presents problems. First, scholars are at risk of missing key developments within armed forces, creating a divide between the ways in which academia and military professionals conceptualize warfare; second, armed forces run the risk of adopting concepts with limited intellectual depth if their concepts are not subject to academic scrutiny. To address these problems, the study sets out to understand what academics and military professionals mean when they discuss integration. This is realized through an analysis of academic and military discourses on integration and interoperability; the latter term came to be understood as important and closely related in the course of this study.

The paper's contribution lies within the following areas. First, it provides perspectives on how the term "integration" is being applied within Western armed forces and what this tells us about the futures that they are pursuing. Second, it contributes to the small but growing body of research on joint operations by defining "integration" and "interoperability," making it possible to distinguish between the two terms. Third, the study presents a conceptual model for how to regard operability, interoperability, and integration as preconditions for carrying out joint operations.

THEORETICAL FOUNDATIONS

Integration, as this paper will discuss, has significant links to the concepts of operations, joint operations, and combined operations. Across military doctrines, is commonly understood as something close to what US doctrine calls "a sequence of tactical actions with a common purpose or unifying theme" (U.S. Department of Defense, 2017, p. x). These are often understood as single service operations. In contrast, joint operations are typically the use of "two or more services in a single operation" (U.S. Department of Defense, 2017, p. xi). Combined operations are "operations conducted with units from two or more allies" (U.S. Department of Defense, 2017, pp. II-21). From an academic perspective, the term is commonly used to define military operations in which two or more services participate (Ben-Shalom & Tsur, 2018; Finlan et al., 2021; Vego, 2008). This study is predominantly focused on the joint operation, similarly understanding it to be an operation in which two or more services participate or in which units from two or more nations participate.

Joint operations hold the promise of synergy – that the combination of forces from different services will yield results greater than if operated individually (Griffin, 2005; Vego, 2008). Several scholars have claimed that Western military organizations are increasingly pursuing joint operations over single service operations (Friedman, 2021; Krause & Phillips, 2007; Vego, 2017). Yet while joint operations hold the promise of synergy, they also introduce complexity on a scale larger than that of single service operations. Early attempts at joint operations such as Operation Eagle Claw (the United States' failed Iranian operation of 1980) or the unsatisfying ability of the services of the United States and a coalition of six Caribbean nations to cooperate during Operation Urgent Fury (1983) are testament to the difficulties of conducting joint operations (Echevarria, 2011). Despite this, military doctrines and concept papers from the United States to the United Kingdom, and from smaller states like Norway and Sweden, are pushing for the capability to conduct joint operations (Forsvaret, 2019; Försvarmakten, 2016;

UK Ministry of Defence, 2014a; U.S. Department of Defense, 2017). The argument for pursuing joint operations is essentially the same as that of combined arms but on a larger scale: military units are able to mitigate the weaknesses of individual systems while at the same time presenting the adversary with an even broader suite of threats through the combination of arms (Finkel, 2011; House, 2001; Luttwak, 2001).

Combined arms is no new phenomenon. It was exercised in ancient Greece (Wrightson, 2019), by Gustavus Adolphus (Rothenberg, 1986), in German infiltration tactics (Boff, 2010), among others instances. It is arguably the *raison d'être* for the brigade and the division, two organizational units prevalent within land forces across the world. Yet, while much of the combined arms literature focuses on land warfare, the concept is present in other domains as well. Naval tactics are routinely based around combined arms, as the composition of naval forces revolve around platforms with differing weapons and capabilities, chosen according to the nature of the task to be carried out and the adversary faced (Hughes, 2018). Air forces also rely on combined arms such as the suppression of air defences prior to ground attack (Withington, 2008). The combination of services into joint operations, or nations into combined joint operations, might therefore seem like a logical step to increase military power.

Scholarship addressing joint operations is, however, thin. Arguably, the cornerstone of academic writing on joint operations is Milan Vego's *Joint Operational Warfare* (2008), spanning nearly 1,500 pages. It is often used as a textbook in military institutions for teaching joint operations and contains lengthy discussions on the conduct of operations in general. The book does not address integration in its chapter on joint operations, however. While Stuart Griffin's *Joint Operations* (2005) serves as a historical overview of the phenomenon of joint operations, it does not discuss integration either. Jan Angstrom and Jerker Widen (2015) discussed joint operations in their textbook on military theory, in which they argued that while joint operations are a natural extension of the increasingly intertwining battle space, integration is hampered by conflicting conceptualizations about warfare across services.

Recent work by Alastair Finlan, Anna Danielsson, and Stefan Lundqvist (2021, p. 358) highlighted how the concept of joint operations is built upon weak theoretical foundations despite its seeming utility. They explored the roots of the concept and how the pursuit of joint operations has often ill-understood consequences, much due to concepts not being intellectually developed. One perspective on integration that emerged in their research is the notion of a scale, with cooperation across services on one end, integration on the other, and interoperability in the middle. They argued that the more inclined towards integration armed forces are, the more effective their joint operations ought to be. But they treated these concepts as variables on an ordinal scale, and did not define them.

There are also discussions on joint operations within more general works on warfare, such as Robert Citino's 2004 study of the evolution of operational warfare, Jonathan House's (2001) classic on combined arms warfare and the volume on operational art edited by John-Andreas Olsen and Martin van Creveld (2011). These studies share a single service focus, however, and do not systematically explore the relationship between services in joint operations, especially not the term "integration." Joint operations are also addressed within historic research on specific joint operations, such as the raid on Dieppe in 1942 (Bishop, 2021), the Falklands War of 1982 (Anderson, 2002) and the U.S. invasion of Grenada of 1983 (Cole, 1997). While such studies showcase the conduct of joint operations under specific circumstances, they do not aggregate their findings into any general conclusions. There are also shorter pieces written by scholars that address joint operations, such as Hew Strachan's 2009 critique of the ability of the British Armed Forces to think in joint terms and essays on joint operations and operational art (Murray, 2002; Vego, 2017). These texts either discuss joint operations generally or highlight specific aspects. While interesting, however, they are short and only offer general appraisals.

Summarized, while academic writing on joint operations in general and integration specifically is sparse, we see steps towards academic study of integration, most notably in Finlan and colleagues' 2021 discussion of a joint operations on scale. Additionally, during the literature review, it became apparent that the term "interoperability" was commonly used when discussing joint operations, especially when discussing matters relating to integrating forces from different services or nationalities. However, neither "integration" nor "interoperability" were used consistently across previous research, prompting closer scrutiny of similarities and differences between the terms.

The study is designed as a discourse analysis on how integration and interoperability have been conceptualized in academic and military discourses. It leans upon the understanding of discourse analysis as the attempt to uncover how terms are given meaning within a communication or discussion, such as academic or professional debates (Mutlu & Salter, 2013). This not only entails study of the text or script but a consideration of context (Vollner, 2017). Specifically, this study uses the method of discourse comparison to compare how terms are manifested across different discourses in order to draw conclusions (Freiberger, 2019).

The academic discourse is constructed through the use of Google Scholar and searches at the Swedish Defence University library on the key terms “integration,” “interoperability,” “joint operations,” and “combined operations.” To be considered part of academic discourse, the written pieces have to be published in academic journals, by academic publishers, or by think-tanks such as the RAND reports used in the study. While the data is not exhaustive, it consists of the most widely circulated and cited sources and should represent dominant approaches within academia. While the searches yield between 3,000,000 and 6,500,000 hits per term, closer scrutiny shows that much of the findings are irrelevant, being about other topics or fitting neither the academic nor professional discourses. To filter, the findings from the first ten pages of the searches are assessed and the works that address either integration or interoperability within the context of joint operations or combined operations are included. This means a total of 10 academic works are selected from roughly 400 search hits.

The military discourse is constructed by examining military doctrines and professional debates on these key terms. The military discourse focuses on three nations: the United States, Britain, and Sweden. The United States is chosen because it is a dominant actor within military matters and what it decides upon is often mimicked by others. Britain represents a mid-range actor, having a significant military capability of its own but being dependent upon other actors such as NATO and the United States. Sweden represents a small state, neutral and with limited experience of joint operations, meaning that it should provide other perspectives on integration. The doctrines used are limited to capstone doctrines at the strategic or joint operations levels and concept papers on integration, such as the integrated campaigning discussed in the United States and the British Integrated Operating Concept. The total comes to one doctrine and one concept paper from the United States, two British doctrines and one concept paper and two Swedish doctrines. The professional debates are constructed using the search function of professional journals, specifically *Joint Forces Quarterly*, *Military Review*, *Army Sustainment* (US), *British Army Review*, *Wendell Room* (UK) and the Royal Academy of War Science’s journal and blog (Sweden) to search for debate pieces addressing the key terms. These pieces are written primarily by serving officers, but in one case by a defence analyst previously employed by the Royal Air Force. The study uses five U.S. debate pieces, three from Britain, and two from Sweden. These are selected from a total of 26 search findings in the journals and the blog above, where 15 pieces of data are excluded because they only address the terms superficially.

The discourse analysis is initiated with a skimming of the texts to familiarize the researcher with the contents. Then follows a search within the texts on different variations of the terms “integration” and “interoperability” to identify all instances where they are addressed. The sections in which either of these terms are mentioned are then read in detail and their main features summarized. This is done for every text, after which they are compared to each other, first within and then across discourses. This often entails returning towards the original texts to analyse nuances and to revise interpretations of the meanings given to key terms within the discourses. Finally, conclusions are drawn and the findings summarized.

THE ACADEMIC DISCOURSE

This section begins by examining academic writing on integration, followed by writing on interoperability. Finlan and colleagues (2021, p. 359) write on integration briefly, stating that integrated forces “fight holistically in a shared ‘integrated’ fighting space that transcends traditional conceptions/boundaries of warfare.” They do not, however, delve into what that actually meant, apart from that it was the highest level of collaboration within joint operations. Uzi Ben-Shalom and Yuval Tsur (2018, p. 88) briefly discuss integration in their study on joint operations within the Israel Defence Forces (IDF). They present integration as the inclusion

of elements from one service into the operations of another service, offering the example of the integration of attack helicopters and close air support within ground operations in which the Israeli Air Force (IAF) retained control over the air assets in accordance with specific assignments aimed at supporting ground operations. Zoltán Jobbágy's (2019, p. 37) study potential effects of NATO joint operations, concluding that combining fire from one domain with manoeuvre in another represents a form of integration presenting the adversary with an intractable dilemma. Jobbágy also discusses how the ongoing technical evolution means that systems are integrated in new ways, both when it comes to how they are used and in terms of who uses them. A report from RAND discusses the developing tendency within U.S. forces to integrate capabilities from different domains at increasingly lower echelons of command (Priebe et al., 2018); access to air support for ground forces, for example, has consistently been given to lower tactical levels. The report goes on to discuss integration as reliant upon shared terms, relationships, organizations, processes and principles (Priebe et al., 2018, p. vi). It also states that there was a conflict between the Air Force's highly centralized approach to command and the more general mission command philosophy of the U.S. Armed Forces, as expressed in their joint doctrine. The study questions the degree to which the U.S. Air Force was able to integrate with the other services within a joint operation, concluding that while the Air Force's capstone doctrine preached joint concepts, lower level doctrines maintained an Air Force-centric approach to warfare (Priebe et al., 2018, p. 13).

Apart from these works, no research was found dealing with integration in a joint operations context.

In contrast to the rarity of the term "integration", "interoperability" was a reoccurring term within scholarly writing on joint operations. The term is not military in origin, being likely derived from computer science, where it is understood as the "ability of two or more software components to cooperate despite differences in language, interface, and execution platform" (Wegner, 1996, p. 285). Academic writing on interoperability within war studies often traces back to Michael Codner's 2003 book on military interoperability, in which he presented a conceptual framework on interoperability centred on organizational, behavioural, logistical, and technical interoperability. Codner's understanding of interoperability centres on abilities to operate effectively together with other nations, primarily within a NATO framework. Similar perspectives are given by Ingvar Sjöblom, who studies Swedish participation in the United Nations Mission in Liberia (UNMIL) from an interoperability perspective (Sjöblom, 2005). His view on interoperability focuses on the ability to cooperate with other nations in a peacekeeping context and largely echoes that of Codner. Joel Wuthnow's (2017, p. 172) study of the evolution of Chinese joint operations examines the ability of Chinese services to operate together within a joint operation. His view on interoperability focuses on inter-service operations; he discusses interoperability from the perspectives of culture, processes, and equipment. Ben-Shalom and Tsur (2018, p. 86) also discuss interoperability within the IDF as the sharing of values across services, especially assumptions about the conduct of operations and concepts of the nature of war. Magnus Petersson (2021, p. 604) adopts a more technical understanding of interoperability when discussing the ways in which Norway's defence acquisition has been guided, in part, by the need for technical interoperability with NATO and the United States. Anna Danielsson examines how military services understand the urban combat environment differently, concluding that the understanding of interoperability should include questions about knowledge (Danielsson, 2022). As exemplified with an account of joint urban operations, a shared operational environment was understood very differently by the participating services because they constructed knowledge differently.

The review of academic discourses on integration and interoperability shows different conceptualizations of the two terms. Integration was generally presented as the merging of domains, capabilities or services within a joint operation, whereas interoperability was presented as compatibility across technical, human, and procedural factors across services or nations.

THE MILITARY DISCOURSE – DOCTRINES

Integration is mentioned 28 times in the U.S. capstone *Joint Publication 1 – Doctrine for the Armed Forces of the United States*. Although used for different types of descriptions, it was most often presented as the combining of "forces, capabilities, and systems to enable their employment in a single, cohesive operation rather than a set of separate operations"

(U.S. Department of Defense, 2017, p. V-16). The capstone doctrine emphasizes the integration of primarily military assets so that all components strive towards the same overarching operational goals. In contrast, the U.S. *Joint Concept for Integrated Campaigning* describes integration as “Joint Force and inter-organizational partner efforts to enable the achievement and maintenance of policy aims by integrating military activities and aligning non-military activities of sufficient scope, scale, simultaneity, and duration across multiple domains” (U.S. Department of Defense, 2018, p. v). Emphasizing that military means are not sufficient to meet future challenges, it instead discusses the integration of civil and military assets into campaign planning. These two conceptualizations are somewhat different. While they both focus on the combining of forces and capabilities, the joint doctrine focuses on military components and the concept paper discusses integration across agencies. Turning towards the second term, interoperability, for the capstone U.S. joint doctrine:

Unified action demands maximum interoperability. The forces, units, and systems of all Services must operate together effectively, in part through interoperability. This includes joint force development; use of joint doctrine; the development and use of joint plans and orders; and the development and use of joint and/or interoperable communications and information systems. It also includes conducting joint training and exercises. It concludes with a materiel development and fielding process that provides materiel that is fully compatible with and complementary to systems of all Services. A key to successful interoperability is to ensure that planning processes are joint from their inception. (U.S. Department of Defense, 2017, p. II-13)

Interoperability is only mentioned once within the concept paper, but not defined. This means that interoperability within U.S. doctrine is understood as the ability to integrate forces, units and systems across services. Supposedly, this is achieved through shared understanding, processes, and technology. Joint planning processes seemed to be of special importance. From these definitions it can be deduced that, for the United States, integration is generally understood as the combining of forces, capabilities or systems, either within or across agencies, towards a shared goal. In contrast, interoperability is understood as having similar force development, systems, and procedures across services.

The British strategic capstone doctrine, the *2014 UK Defence Doctrine*, addresses integration primarily in the sense of the integrated approach, described as a British version of NATO’s comprehensive approach (UK Ministry of Defence, 2014a, p. 44). It thus emphasizes integration in the sense of cross-government and multi-agency cooperation, in which the military contribution is just part of the larger security-promoting operation. “In a national context,” it states, “an integrated approach requires clear national objectives, strong political leadership and collaboration across departments to make sure ensure that the UK’s national power is coherently applied” (UK Ministry of Defence, 2014a, p. 44). This seems to suggest that the desired effect of integration is the cohesive application of national resources. This description of integration was also reflected within the British capstone joint operations doctrine (UK Ministry of Defence, 2014b). It however contrasts the notion of integration presented in the *Integrated Operating Concept*, a concept paper designed to formulate a “new approach to the utility of armed force in an era of strategic competition and a rapidly evolving character of warfare” (UK Ministry of Defence, 2021, p. 5). The paper, and its view on integration, can be summarized in the following quote:

The central idea of the Integrated Operating Concept is to drive the conditions and tempo of strategic activity, rather than responding to the actions of others from a static, home-based posture of contingent response. This means employing the military instrument to compete below the threshold of war, gaining advantage through offering a wider breadth of political choice and credible military options that can be threatened or used to break the will of our rivals. But maximising advantage will only be realised through being more integrated: within the military instrument, vertically through the levels of warfare – strategic, operational and tactical; across government and with our allies; and in depth within our societies. (UK Ministry of Defence, 2021, p. 9)

The paper emphasizes deterrence and the understanding that actions below the threshold of war were now an integral part of military operations, requiring the integration of civil-military capabilities at a general level and the integration of all five domains: air, cyber, land, sea and

space (UK Ministry of Defence, 2021, p. 10). It also discusses integrated action: commanders thinking beyond the enemy and considering additional effects that need to be applied to the many other actors relevant to the achievement of the objective (UK Ministry of Defence, 2021, p. 9). Finally, it predicts a *combat cloud* that would make use of mass data to integrate combat forces for higher efficiency (UK Ministry of Defence, 2021, p. 17).

Interoperability as discussed in the British capstone doctrines is understood solely as the ability to work together with partners across a coalition, predominantly NATO (UK Ministry of Defence, 2014a; 2014b). Defining the term in the context of joint doctrine, the publication states:

Nations will contribute a broad range of equipments, technologies, languages, doctrine and training to coalition operations. While some alliances, most notably NATO, attempt to mitigate interoperability issues through standardisation, problems will remain. Any lack of interoperability, which impacts on the principles of war or operations, will significantly limit the JFC's plans. JFCs will need to understand the interoperability challenges and ensure their operations design accommodates them. (UK Ministry of Defence, 2014b, p. 112)

In contrast to U.S. doctrine, the British doctrine offers only limited discussion on what interoperability is. Beyond the quote, the only time it was discussed with any detail is when it was asserted that "interoperability may be expensive to achieve and sustain and may also require us to operate to a common standard" (UK Ministry of Defence, 2014a, p. 27). Summarized, British views on integration seems to have gone from a term concerning the integration of actors across the entire defence establishment in the early doctrines towards a focus on military activities in the concept paper. As with the U.S. doctrines, the British doctrines seem to discuss integration as the activities required in putting forces and capabilities together. British doctrine hints toward interoperability requiring more than standardization work but is not explicit about what that entails. Interoperability was not mentioned in the concept paper.

The Swedish 2016 Military Strategic Doctrine (Försvarsmakten, 2016, p. 30f) was vague about the meaning of integration and used the term to describe matters such as global interconnectedness or that part of the task of the armed forces is to integrate people from different cultures and religions within the organization. In contrast, the Joint Operations Doctrine 2020 (Försvarsmakten, 2020 p. 33) presents integration more in depth, both as a way of thinking and as the actual combination of personnel, systems, units, organizations and countries. It states that the purpose of integrative thinking is to the creation of synergies on the part of officers through the combination of forces, systems, and capabilities. This is done on all levels: at the tactical level as combined arms, systems in cooperation either within or across services, and as joint operations with multiple services, other agencies or even international partners. Integrative thinking is to be used to combine the joint functions, such as fires and intelligence. In contrast, integration in itself was understood as the actual combining of forces, systems or capabilities. The doctrine even states that interoperability is a pre-requisite for integration (p. 34) and that the primary contribution of the joint level of command is to integrate the joint functions in order to create synergies (p. 48).

The doctrine defined interoperability as the ability to effectively coordinate personnel, systems, units, countries and organizations with the purpose of achieving shared strategic, operational, or tactical goals. It in turn divided interoperability into three aspects: technical, procedural, and human (Försvarsmakten, 2020, p. 34). Technical interoperability was understood as the ability to integrate technical systems across services and with partners. The doctrine referenced NATO's Federated Mission Networking (FMN) as an example of a standard for technical interoperability. It also discusses procedural interoperability, which it understands as a shared methodology for staff work, such as NATO's procedures for planning operations and discussed integration in relation to interoperability, essentially stating that interoperability is the ability to integrate forces, while integration is the actual merging of forces and capabilities in operations. As such, the Swedish doctrinal approach to integration revolves around the theory and practice of combining, and the idea that interoperability is necessary for successful integration.

THE MILITARY DISCOURSE – DEBATES

Turning towards military debates on integration, General David Perkins, then commander of the United States Army Training and Doctrine Command (TRADOC), discusses the integration

of U.S. forces in an article on Multi-Domain Operations (Perkins, 2017). Perkins emphasizes the necessity of planning operations so that manoeuvre, firepower, and synchronization of forces across multiple domains are integrated into a coherent operational plan. This requires significant effort both to plan for and to coordinate, demanding an officer corps able to think about operations in terms of the five domains of land, naval, air, space, and cyber, and to utilize forces in all of these in pursuit of the overall operational objective. Perkins's view on integration thus revolves around the combining of capabilities from different services on the same battlefield – essentially combined arms warfare but on a more complex scale – and an emphasis on the ability of officers to think in broader terms than they have traditionally been required to do.

A second perspective was offered by two officers in *Joint Forces Quarterly* in an article discussing the achievement of cross-domain synergy in joint operations (Odom & Hayes, 2014). Their conclusions emphasize the importance of integration across three axes: integration of domains, integration of forces, and integration of capabilities. Simplified, integration of domains means acting across multiple domains within a single operation. Integration of forces means forces from multiple services working towards the same domains. Lastly, integration of capabilities revolves around integrating the capabilities available to the commander. Examples include integrating fire from one domain into another, or gathering intelligence across multiple domains and coordinating them with fires. According to the authors, capabilities integration requires a sense of creativity on the part of the officers – to use what is available in novel ways.

Writing on interoperability by U.S. military professionals suggests the following understanding of interoperability. In a 2014 *Joint Forces Quarterly* article, five officers discuss interoperability from an aerial perspective (Bass et al., 2014). From it, we are to understand interoperability as a question of technical compatibility – in their case, the capacity of data links to send and receive data across services and potentially other nations. In a 2016 article, meanwhile, four officers discuss an entity known as the multinational interoperability council and how it improves coalition interoperability through doctrine development, coalition planning, exercises, and experimentation (Pryor et al., 2016). In their understanding, interoperability, primarily a question of processes, is achieved through standardization within a coalition.

Yet another perspective was offered by four officers writing in *Army Sustainment* about interoperability in logistics (Fogg et al., 2020). Their primary argument is that interoperability is the standardization of procedures and modes of operating – similar to what the capstone doctrine describes as processes. For technical compatibility, they use the term “standardization” instead, providing a division between standardization (technical) and interoperability (processes). From the American debates, we can discern that integration is generally discussed as the merging of the battlespace across domains and services, which is argued to require creativity on part of the officers. In contrast, interoperability is generally presented as a pre-requisite for operating together with other services, with a focus on primarily technical aspects.

The British debate on integration is dominated by the Integrated Operating Concept. One British army officer writes in *British Army Review* that fulfilment of the Integrated Operating Concept requires not only formal cooperation across government agencies, but on how it requires individuals and a culture that fosters integration (Beckett, 2021). In his view, integration is about understanding and being able to work together. Another British army officer writes that the very ambition of the concept, the achievement of integration across government agencies, is challenged by “concept fatigue,” explained as the existence of multiple and complete concepts across different government agencies within the United Kingdom (Maguire, 2021). His discussion on integration revolves around cooperation across government agencies.

Another perspective is given by a defence intellectual in the same blog, who stated that notion of integration is just a re-hashing of old concepts that have existed for decades (Chubb, 2021). Again, the critique was that the Integrated Operating Concept fails to create the integration it prescribes, as government agencies within the UK are prone to actions aligned with their interests, rather than those spanning across agencies.

Summarized, the British view on integration is focused on inter-agency integration, in contrast to the U.S. discussion above. While there were several British articles that included interoperability in the headlines, analysis of British professional writing revealed no substantial arguments about its meaning.

Turning towards professional writing in Sweden, the situation is the opposite. No writing on integration was uncovered, only on interoperability. One Swedish officer expresses concerns that the striving for interoperability with NATO would reduce Swedish military culture and end traditions of manoeuvre warfare and mission command in the pursuit of standardized procedures (von Walter, 2021). He describes interoperability as the harmonization of Swedish staff procedures to those within NATO and how the adoption of such methods by a non-NATO institution would provide the worst of two worlds: first, the abandonment of national procedures well suited for Sweden's circumstances in favour of procedures that are suited for a large alliance and, second, the adoption of concepts from a partner that has no formal obligations to aid, meaning that the pursuit of interoperability might be based on cooperation that will not occur.

Another perspective was offered by a former head of the army, who argues that that interoperability is the ability to cooperate with the armed forces of other nations, based upon procedures, command philosophy, tactics, and a few other factors (Grundevik, 2008). This perspective revolves primarily around interoperability as procedure and culture rather than technology.

In contrast, a third perspective was offered by an officer after a conference held by the Royal Swedish Academy of War Sciences (Demin, 2007). This officer emphasizes the technical aspect of interoperability. Writing of the need for technical standards to ensure international interoperability, he signals an understanding of interoperability as technical compatibility towards similar services of other nations. Swedish debates on interoperability therefore seem to revolve primarily around procedures and tactics and the like, and secondarily on technology.

DISCUSSION

The analysis suggests that different meanings are ascribed to "integration" and its related term "interoperability" depending on author and context. Although there is some overlap between the two concepts, I find it possible to make a rough division between them. Integration is often presented as the merging of domains or services within joint operations, while interoperability is generally understood as the ability to integrate either technical systems or forces. The following section will discuss how integration and interoperability can be understood in greater detail and in relation to each other.

The perspectives presented on integration are understood predominantly as the action of combining forces, and to some degree capabilities, within a joint operation. There was sparse academic writing on integration in comparison to that on interoperability. The opposite was true for doctrines, which devoted more text to integration than interoperability. Three dominant themes on integration emerged: the integration of forces, the integration of capabilities, and willingness to integrate. The integration of forces means the use of forces from different services or nationalities within an operation towards the same domains. Services conducting operations in parallel within a wider theatre are not an example of integration of forces – they have to operate towards the same domains to be considered integrated.

The other aspect is integration of capabilities. This entails commanders thinking more broadly than they have traditionally been schooled to do: how to use systems or capabilities in novel ways to create new threats for an adversary, for example, a question of integrating capabilities that have traditionally been allocated a specific level. With the ongoing proliferation of unmanned aerial systems, the question of which organizational level should have such systems allocated is an example of integration. Another is the integration of indirect fires at levels that have traditionally been without access to this capability. A third aspect is found in the willingness, and perhaps understanding, of individual officers to think about integration and to seek ways to combine their assets and capabilities rather than deploying forces in the ways that their services have previously done.

The contrasting nature of two perspectives – the British focus on integration as cross-agency cooperation and the Swedish discussion on integrative thinking – is worth noting. Already noticeable in the 2014 British doctrines, and continuing in the 2021 concept paper and its surrounding discussions, was a significant emphasis on the integration of military and civilian actors within operations below the threshold of war. In contrast, the Swedish joint operations

doctrine emphasized the importance of integrative thinking, yet its definition was vague. While the most obvious forms of integration lie in the combination of land, air, naval, and increasingly cyber and space forces, the way in which technology opens up novel avenues for applying military force might oblige officers to think in terms beyond the simple combination of the classic capabilities of the services. As such, integrative thinking is perhaps not so much about combining assets from the other services, but in integrating established and developing capabilities in ways not yet formalized. The importance of integrative officers, especially in terms of will and creativity as highlighted in the military discourse, is a novel finding that, to my knowledge, has not been previously identified.

The discussions on interoperability suggest it should be understood as the ability to work closely together with someone else, be it another service or the armed forces of another country. We can arguably identify three dominant aspects: the technical, procedural, and human. Technical interoperability is the capacity of technical systems to work together. The discussion is often centred on information sharing systems, which have to be able to communicate with each other. Examples include command and control (C2) systems that have to be able to receive and send information, whether it be inter-service between an airplane and a ship or between nations. Interoperability also includes logistical aspects, such as the ability to use the same munitions, fuels, or spare parts. Being interoperable when it comes such factors greatly improves logistics, increasing the availability of systems such as fighter planes. The second aspect is procedural interoperability, which revolves around having similar procedures. As collaboration across services or nations often occurs at a staff level, discussions on procedural interoperability tend to revolve around planning methods, language and staff work procedures. NATO's AJP-5, a doctrine spelling out a common procedure for operations planning within the alliance, provides an example of a method for the creation of procedural interoperability (NATO, 2019).

The third aspect, arguably somewhat difficult to grasp, is the human aspect of interoperability. Two perspectives on this have emerged in this study. The first is cultural: how interoperability requires cultural sensitivity and a knowledge about cultural differences across organizations and nations. This has been discussed in other contexts within previous research (see, for example, Finlan, 2013; Mansoor & Murray, 2019). The second perspective concerns knowledge and the understanding that actors produce knowledge differently, as Danielsson (2022) identified in her discussion of the different ways in which the urban battlespace can be understood: actors might think they share an understanding of a matter when they have in fact produced very different knowledge based on their understanding of war. Summarized, the findings suggest that interoperability is necessary for conducting joint operations, but not sufficient to do so.

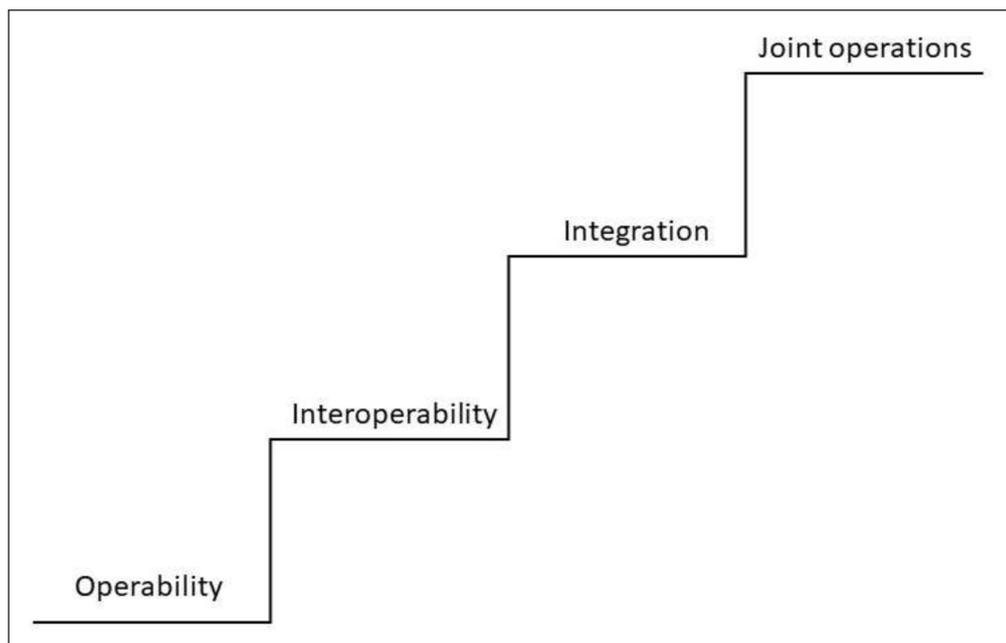


Figure 1 The four steps of joint operations.

Figure 1 above serves to visualize how the findings can be understood as requirements for the conduct of joint operations. For theorists, this figure helps to bring conceptual clarity to key concepts – how operability, interoperability, and integration relate to joint operations, and how

they can be understood as steps towards conducting joint operations. Asking at which level a unit or service has the ability to operate, the figure provides a useful basis for the evaluation of capability for practitioners. The term “operability” on the bottom step was coined at a seminar where this paper was presented, during which a participant suggested that all joint operations should begin with the question of operability – is the service even able to operate by itself? Operability is therefore understood as service’s ability to conduct a sequence of tactical actions with a common purpose or unifying theme.

The second step is “interoperability,” understood as the ability to combine systems and forces across services, potentially even across government agencies and nations. Interoperability provides the foundation for the integration of forces, making them work together. It is understood as consisting of three aspects: technical, procedural, and human. Services, or even armed forces intent on working with others, need to ensure that they are able to work together with others based on technical and procedural standards, with a sensitivity accounting for differences in culture and knowledge.

The third step is “integration” – a term designating the merging of domains and services. While interoperability is understood as the ability to work together, integration is understood as the actual merging of forces and capabilities prior to carrying out a joint operation. Integration requires officers able to think and act beyond their service tactics; to achieve integration, that is, creative and innovative officers are needed. The fourth step is the actual conduct of joint operations, where forces or capabilities from different organizations are put to use in the pursuit of a joint goal, which, according to the findings in this study, should require all three of the preceding steps.

CONCLUSIONS

Integration seems to be the *mot de jour* for armed forces, reflected in terms such as integrated campaigning, the Integrated Operating Concept, and Multi-Domain Integration. This paper has studied the meaning of integration within the context of joint operations. It has done so through a discourse analysis on the application of the terms “integration” and “interoperability” in academic and military discourses. Based on the analysis, the following conclusions have been drawn.

Integration and its sister term interoperability can be understood as two related but still distinct terms relating to the ability of armed forces to conduct joint operations. This study suggests a conceptualization where the ability to operate jointly is dependent upon operability, interoperability, and integration. In short, the basis for joint operations starts with the ability to conduct operations within the service itself – what the study terms “operability.” It is followed by interoperability, understood as the ability to cooperate across services based on technical, procedural, and human factors. This is followed by integration: the actual merging of domains or services.

Integration, requiring the willingness and ability to integrate, is predominantly implemented prior to the actual conduct of operations. If these three preconditions are met, armed forces ought to be able to conduct joint operations. Using this conceptualization as a framework when discussing joint operations provides scholars with a more detailed understanding of the terms than previously available (see, for example, [Finlan et al., 2021](#)). The framework can also be used by both scholars and practitioners to evaluate armed forces on their ability to conduct joint operations, based on whether they are operable, interoperable, or even integrated.

Joint operations continue to be an understudied topic. I have acknowledged above the lack of systematic studies on joint operations in general and integration specifically. This is an issue given the resources invested into joint operations across Western armed forces. This study suggests continued research into the topic of joint operations and integration. Given the war in Ukraine, the focus of Western armed forces has shifted towards the capability to fight a peer or near-peer adversary. This type of fighting will require joint operations to be successful, likely even within the context of alliance warfare as combined joint operations. As this seems to be the way of Western armed forces in the near future, our understanding of the phenomenon of joint operations should be of scholarly interest. Focusing specifically on integration would mean delving into a research gap, with close to no previous research – notwithstanding the term’s regular use on the part of military practitioners.

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