

Notes on military capability concepts and their relevance for analysis of system characteristics

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Abstract – A plethora of views, definitions and concepts concerning military capability can cause misunderstandings among scholars and professionals in the defence and security sector, as well as they can confuse the public on important issues. This study captures and describes a few in an effort to increase awareness; Combat Power, Fighting Power, Joint functions, Warfighting functions, Elements of combat power, Warfighting Capability, DOTMLPF(I), TEPIDOIL, Fundamental inputs to capability, Defence lines of Development, and Military Power. The study also highlights their systemic character and guides the reader briefly in matching issues with suitable concepts.

Appendix 1 matches Swedish concepts to those listed in the study.

1 INTRODUCTION

Capability is central to assessments and decision-making in the defence and security sector, and hence to debate and discussion. But the understanding of the term seems to differ a lot, thus hampering fruitful communication between scholars or professionals, then risking confusing the public on important issues. "Sweden needs a more resilient national defense capability that is better funded and resourced"[1]; or, “ (Our) missile systems are powerful assets to have on your side, giving you the advanced capabilities modern forces need in order to address a wide range of conflict scenarios”[2]. These are two examples of statements regarding military capability that together illustrate the wide spread in use. The first originates from a policy maker and relates to the whole-of-the-nation effort to defend Sweden from foreign military aggression. The second originates from a manufacturer of advanced products indicating that you can buy military capability off the shelf. In fact, research shows agents of different interests in the sector tend to have very different interpretations [3]. Consequently, there are also many different ways to define and describe capability. Lindbom et al made a thorough review of definitions in scientific literature related to risk management [4]. They found that the word capability is frequently used but rarely defined. Still they managed to list thirteen definitions related to their area of research. They concluded that there are definitions that seem to equate capability with resources, like in the second statement above. Other definitions focus on the ability to solve a task or to obtain an objective, like in the first statement above. Lindbom et al also note that *capacity* is frequently used as a synonym.

This work adheres to the view that we need a holistic, or systemic view on contemporary and future military challenges and solutions, both continuously increasing in complexity. When making assessments or decisions on what to do about a military threat we can probably agree technology is an important issue, but clearly it will never be enough to reduce the situations of interest here to a question only about the quality or quantity of

materiel. Neither are successes in military issues only about leadership, resolve or legitimacy etc., either. However, if having a systems approach we can view a problem situation as a socio-technical system, including a potential military opponent with personnel equipped, trained, and organized to enforce the will of their leadership on us. Correspondingly, we can view our own military force as a respondent system made up of our own interacting social and technical components. See Lawson for details on the systems model presented [5]. Having this view, decisions can be made in relation to the anticipated effect of the entire respondent system if engaging the situation system – and risks of serious sub-optimizations are reduced. This is equivalent to making decisions based on how these are anticipated to affect the overall ability to solve a military task. Hence, if having a socio-technical systems view on matters in the military domain it is wise to start with a definition of military capability associated with the overall ability to solve a task or to achieve a goal. Such definitions will also be in harmony with lexical definitions like “the quality or state of being capable” [6], or “the ability or qualities necessary to do something” [7]. A few useful definitions are presented below.

Assume we can agree assessments of a military force is ultimately about assessing its capability in some situation. The next step is then to analyse the problem at hand. This might involve questions like: if we choose this course of action how will that affect capability?; or, if we develop and acquire this equipment how will that affect capability?; or if we organize in this way how will that affect capability? Depending on the nature of the question the analysis will require a relevant concept of what elements constitutes capability, and also a valid theory for how the elements relate. As already touched upon, having a socio-technical view on capability means acknowledging that capability constitutes both social and technical components. From this view follows that, to properly understand capability, we have to involve researchers and perspectives from both social science and from engineering disciplines. Though, as stated in the beginning any lack of understanding for others’ viewpoints risk hampering a fruitful dialogue.

The aim of this text is therefore to present concepts commonly used in the military domain associated with military capability. The purpose is to increase awareness of nuances in order to further the discourse on making relevant, well-founded, assessments as basis for informed decisions on important issues for society.

In the next section a number of these related concepts are exemplified and described. They are presented in the order of increasing systemic complexity. The last section presents a summary and a comparison.

2 PRESENTATION OF CONCEPTS

2.1 Definitions of capability in military context

In the 2013 issue of *Textbook in military-technology, volume 9: theory and methods*, the authors makes a slight modification of the lexical definitions and define capability as “to be able to do something successfully” [8, p. 22]. They explain that in military contexts the term is often used with attributes relating the capability to missions at different levels of conflict, like having the capability to stop a military invasion, to do surveillance of own territory, or to perform ceremonial tasks. With this description it follows that a military actor is expected to incorporate many different capabilities. Some of them are in continuous use while others

might never be tested. Whether a military actor can do something successfully or not of course also implies it depends on the circumstances of the operation in question, and on potential adversaries.

The authors of the Subject Description of Systems Science for Defence and Security [9] instead refers the term to “a potential in a society, organisation, group or individual to achieve a specific goal given the right resources”. They also state that characteristic to capabilities in military units is that they are shaped under requirements from “uncertainty and large potential risks, both for society and for the individuals charged with protecting it”[9, p. 4]. Thus, this definition highlights that capability is something abstract, an inherent potential in people, and that it exists in organizations on different levels. The referred text also justifies to speak of *military* capabilities, to distinguish them from others.

In the Swedish Armed Forces handbook on managing the development of military units [10] a definition from The British Ministry of Defence is used. Capability is defined as: “A high level specification of the enterprises ability”(MODAF version 1.2 [10]). The fact that there is a purpose to the enterprise and its ability, to achieve military objectives, is only implied. The systemic view on capability is nonetheless evident and clearly developed in the publication.

NATO in turn defines capability as “the ability to create an effect through employment of an integrated set of aspects categorized as doctrine, organization, training, materiel, leadership development, personnel, facilities, and interoperability” [11]. This definition is easily associated with a systemic view on capability and is also very specific about its constituent elements.

Common to these definitions of the capability concept is that they associate capability with doing something or achieving an objective. They are thereby useful separating one capability from another. We can say that this resource contributes to that capability but not that one, or we can say that we lack this or that capability. There are many other definitions. See for example Henshaw et al. [3] or Lindbom et al.[4]. In addition, there are concepts easily associated with military capability, and sometimes used synonymously. *Combat power* is one example.

2.2 Combat power

The total means of destructive and/or disruptive force which a military unit/formation can apply against the opponent at a given time. [12], [13]

Power is frequently used in our context of interest. According to the Merriam-Webster dictionary there are several lexical meanings. Two of them are interesting in this text. First the “ability to act or produce an effect” and second the ”possession of control, authority, or influence over others” [6]. Thus having power could very well involve having the military capability to influence others.

The quote above is how NATO and the US Department of Defence defines the concept called *Combat power*. Note that the concept seems to be associated with the *means* to fight available to a specific military formation, of any size. Furthermore, it is related to the formation’s ability to destroy or disrupt an opponent – not to perform any specific military task.

This concept might primarily be useful in political or strategic power discussions, perhaps for comparisons of combat power between two opponents, if it is greater or lesser, or for discussing whether a resource of interest contributes or not. From a systemic viewpoint on capability the utility of this concept seems limited. Though, there are other concepts with similar labels that do contribute, like *Fighting power*.

2.3 Fighting power



Figure 1 An illustration of the concept of Fighting power (*krigsföringsförmåga*) found in the Swedish strategic military doctrine 2016. The three pillars of the temple signals that the three factors, the physical to the left, the conceptual in the middle, and the morale to the right, interact to produce a military actor's fighting power.

The ability of any actor to use, or threaten to use, force to achieve a desired outcome is dependent on their will to act, their understanding and their capability to act decisively. Together these determine an actor's effectiveness – their fighting power – and represent respectively its three interrelated components; morale, conceptual and physical. No component is more important than any other; for instance, it does not matter how advanced the platforms, weapons and sensors if the people operating them lack legitimacy, morality, motivation, doctrine and training, or adequate leadership. Likewise, the three components are not independent; each overlaps with, and relies on, the others. [14, pp. 25-]

So far the presented concepts can only be used for accounting, managing a portfolio of capabilities. They say very little about how various phenomena affects military capability. However, in many Western doctrines, the ability to fight has for a long time been captured using a concept labelled the *Fighting power* of a military actor. The quote above is from the British doctrine. The Fighting power as defined there comprises three interdependent components: the conceptual component, (the thought process), the morale component (the ability to get people to fight); and the physical component (the means to fight). Hence, what the actor wants to do is a product of the conceptual component. The manpower and equipment required to do it constitute the physical component, and the resolve to do it is a product of the morale component. The interaction between components is captured in an illustration from Swedish doctrine in Figure 1.

Unfortunately the theoretical origin is difficult to trace with certainty.¹ The concept is sometimes attributed to Martin van Creveld (1981), but its roots is undoubtedly found in

¹ Stefan Lundquist, Cmdr/Ph.D, Swedish Defence University, personal correspondence, 18th Dec 2019

the writings of Sun Tzu and Carl von Clausewitz. Sun Tzu discussed the morale part of fighting power as one of five factors: "The art of war, then, is governed by five constant factors, to be taken into account in one's deliberations, when seeking to determine the conditions obtaining in the field. These are: (1) The Moral Law; (2) Heaven; (3) Earth; (4) The Commander; (5) Method and discipline." [15, Ch. 1]. Carl von Clausewitz devoted the first chapter in his second book in *On war* to discuss "moral and physical forces". He writes "War in its literal meaning is fighting, for fighting alone is the efficient principle in the manifold activity which, in a wide sense, is called war. But fighting is a trial of strength of the moral and physical forces by means of the latter. That the moral cannot be omitted is evident of itself, for the condition of the mind has always the most decisive influence on the forces employed in war" [16, Bks. II, Ch.1]. The conceptual component in Fighting power, in practice what we call doctrine, is probably of a more modern origin.

Having a systems view on capability it is especially interesting to note that Fighting power is viewed as the effect of three interacting and interdependent components, thus, it can be regarded a system's effect. The concept is for example feasible in the study of cases where the morale component seems to compensate for an adversary's superior physical forces, or, in the study of cases where an innovation in physical forces does not seem to have the foreseen effect on the battlefield, perhaps due to underdeveloped doctrine.

2.4 Joint functions, warfighting functions or the elements of combat power

"Joint functions — Related capabilities and activities placed into seven basic groups of command and control, information, intelligence, fires, movement and maneuver, protection, and sustainment to help joint force commanders synchronize, integrate, and direct joint operations." [12]

"To execute operations, commanders conceptualize capabilities in terms of combat power. Combat power has eight elements: leadership, information, mission command, movement and maneuver, intelligence, fires, sustainment, and protection. The Army collectively describes the last six elements as warfighting functions. Commanders apply combat power through warfighting functions using leadership and information." [17]

Another systemic conceptual framework is used by military actors in the design of their forces. Its main purpose is to facilitate the planning, or study, of dynamics in the application of capabilities in military operations. It is called *Joint functions* on joint level in the US and in NATO, or *Warfighting functions*, or *Elements of combat power*, on component level. See the quotes above. There is a difference in the exact number or clustering of functions or elements but the use of the concept is similar. It is described in the NATO allied joint operations doctrine: "The joint functions are a framework that provides the commander and staff a means to visualize the activities of the force and to ensure all aspects of the operation are addressed. They are a point of reference, as well as a description of the capabilities of the force. A number of subordinate tasks and related capabilities help define each of the joint functions and some of them could apply to more than one function. In any joint operation, the commander joint task force (JTF) may choose from a wide variety of joint and service specific capabilities and combine them in various ways to perform joint functions and accomplish the mission." [18, Para. B1] For example, an artillery battalion with the capability to deliver indirect fire might in some phase of the operation support the mechanized battalion and in some phase of the operation produce fires to neutralize the

target – thereby contributing to the task force’s collective functions maneuver and fires respectively. The NATO allied joint operations doctrine also points out that “forces and assets are not characterized by the functions for which the commander is employing them. A single force or asset can perform multiple functions simultaneously or sequentially while executing a single task.” [18, Para. B1] How the subordinate capabilities are applied to contribute to the joint functions is determined in the operations plan.

The Swedish strategic doctrine uses the equivalent of six joint functions for the purpose described above: intelligence, movement and maneuver, fires, command and control, sustainment, and protection [19]. In the handbook on management in the development of military units availability has been added [10]. The concept is used in the handbook to make sure that a military unit under development is designed with all essential capabilities in mind [10, p. 21].

Another way to describe the concept is using a technique known as design logic. When designing a military force the joint functions/warfighting functions/elements-of-combat-power can be viewed as the *functions* necessary to fulfil the system *purpose*. The sub units realizing the physical *form* of the force support the functions necessary to solve the mission. See Figure 2. The pattern is recursive and consequently we can use it to find a balanced design in any size of military force – even in a single platform unit like a Main-Battle-Tank, as illustrated in Figure 3. The design logic pattern helps us to distinguish between a function and a capability. There is a difference, but one that can be difficult to perceive at times. What is a capability and what is a function is a matter of which mission you have in focus. Note that when using the concept to improve a technical system you have already decided on the general design, but you can use it to balance subsystems for overall performance. In the MBT example the framework can be used to support a decision on whether to rely on

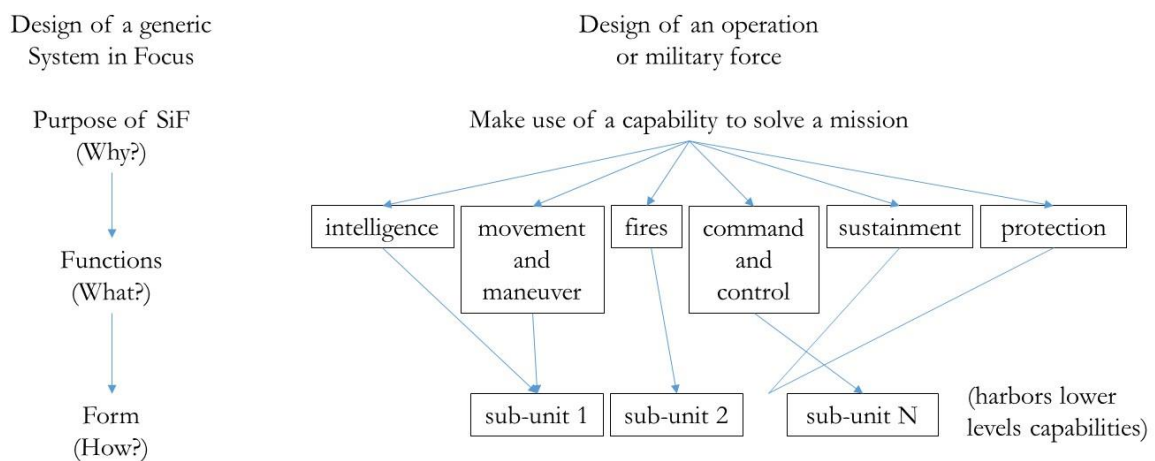


Figure 2 illustrates the use of the design logic pattern to illustrate the role of joint functions/warfighting functions/elements-of-combat-power in the design of a military force. The pattern to the left is generic and the pattern to the right is specific to the design (force generation in the planning of an operation) of a military force.

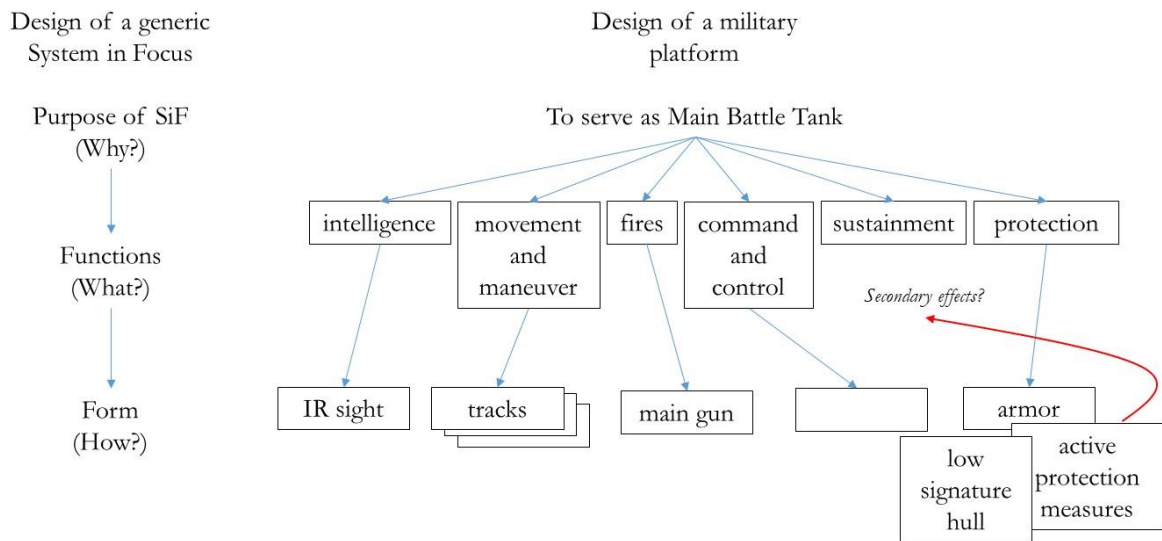


Figure 3 illustrates the use of joint functions/warfighting functions/elements-of-combat-power to obtain a balanced design in a military platform, in this case in a Main Battle Tank.

passive protection or whether to invest in active protection measures. The latter has to be weighed against increased signature within the protection function and it might have unwanted secondary effects on other, like possibly on movement and maneuver.

2.5 Capability-Based-Planning and Warfighting capability

At the end of the Cold war western states found themselves faced with great uncertainty to what end their armed forces should be developed and trained. To many states, like Sweden, there were no longer an evident threat and a concept called *Capability-Based-Planning* was born [20]. Using Capability-Based-Planning, fighting power is viewed as a portfolio (a collection) of so-called *Warfighting capabilities*. Each Warfighting capability refers to an objective, a task that needs to be accomplished in support of the objective, or the task force necessary to conduct these tasks. They are seen as building blocks possible to combine to form new warfighting capabilities on successively higher command levels. The purpose is primarily to support military capabilities management in uncertainty [21]. One merit is that a military actor can “provide capabilities suitable for a wide range of challenges while working within an economic framework that necessitates choice” [22, p. 16]. Another important result claimed by proponents is that it shifts the generation of requirements away from a platform centric focus [21]. The US portfolio called *Universal Joint Task List* is often used as a model for other states.

The Swedish Armed Forces started implementing Capability-Based-Planning, with a portfolio of Warfighting capabilities, the so called *Traceability model* (translation from *Spårbarhetsmodellen* in Swedish), at the turn of the last decade [23]. A Warfighting capability was defined as “a specific activity, for which resources have been acquired and trained, in

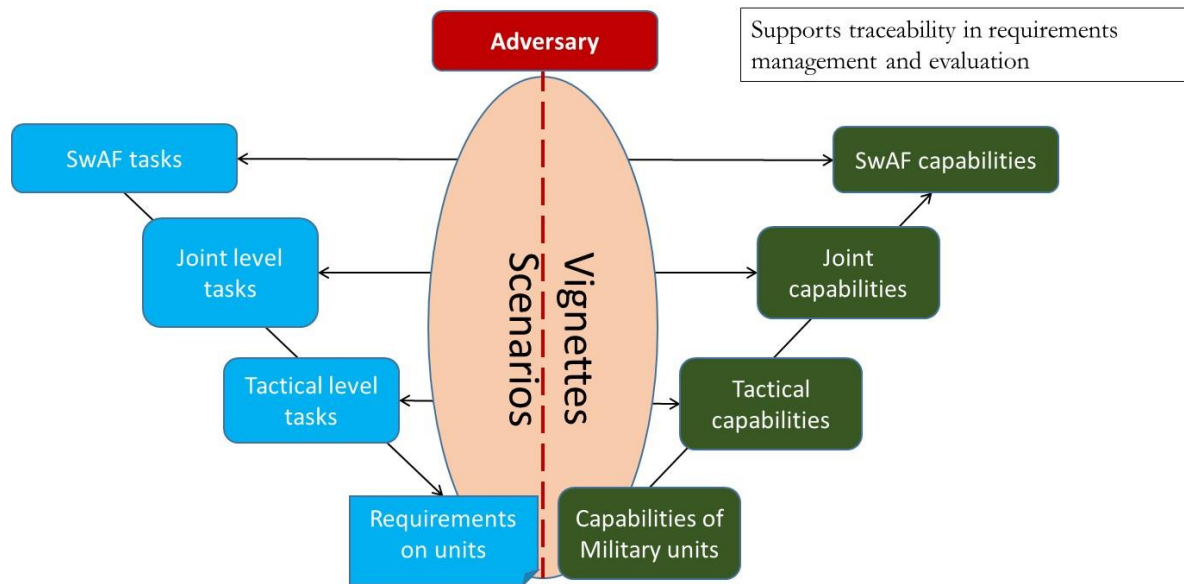


Figure 4 illustrates the Traceability model that the Swedish Armed Forces use for their version of capability based planning. To the left in the Vee-model is shown how the tasks from the Swedish government is recursively broken down into tasks at successively lower command levels, and on the right side how the capabilities of the armed forces are successively integrated to correspond to these tasks. The diagram has been adopted from an illustration of “Spårbarhetsmodellen” by Nygren and Hård af Segerstad (2019)

order to achieve a desired effect that varies depending on scenario and ambition” [23]. After 2015 the Swedish portfolio of warfighting capabilities is no longer public. However, the ambition to uphold traceability between tasks and capabilities on all command levels still applies. In a Swedish Armed Forces (SwAF) presentation [24] to the Swedish National Financial Management Authority (ESV) the traceability model was illustrated using the famous Vee-model (Forsberg and Mooz, 1991[25]). See Figure 4. It shows how a strategic task corresponds to *Strategic capabilities*, how joint tasks corresponds to *Joint capabilities*, how tasks on component level corresponds to *Tactical capabilities*, and lastly how all of these are integrated from the capabilities of the military units. The verification of capabilities on each level is performed against predefined vignettes and scenarios involving a potential adversary in focus.

The Capability-Based-Planning and Warfighting capabilities concepts thus makes it possible to have a system management view on the forces and capabilities of a military actor. A Lego metaphore easily comes to mind. Having all kinds of pieces in your toy box sets you up to build a new and innovative construct if the need suddenly arises. The tools and processes of Systems Engineering seems to apply.

2.6 The DOTMLPF construct and similar acronyms

In parallel to the Capability-Based-Planning initiative, many nations have found it useful to think of and manage military capabilities as systems comprising similar abstract elements.[22, pp. 17–18] In the US the system elements comprise; Doctrine, Organization, Training, Materiel, Leadership and education, Personnel and Facilities (DOTMLPF) [20]. NATO adds an I for Interoperability [11]. In Australia the system elements are referred to as *fundamental inputs to capability*; these are: Personnel, Organization, Collective training, Major systems, Supplies, Facilities and training areas, Support, Command and management [26]. Similarly, in UK the elements are referred to as eight *defence lines of development*: Training, Equipment, Personnel, Infrastructure, Concepts & Doctrine,

Organization, Information and Logistics (TEPIDOIL) [27]. The common aim is to obtain a holistic view of capability development, thereby shifting attention away from the traditional platform centric approaches and towards non-materiel aspects.

To scholars interested in understanding the value of technology in military capability this is useful. Regardless of the categorization of elements, we realize that any component in a system, like the Materiel/Equipment element, can deliver no effect by itself but has dependencies to the other elements. Thus, equipment has to be operated by well-trained people, organized to support a fitting doctrine. Consequently, when assessing the military utility [28] of a new technology we should relate it to the predicted change in delivered military effect, which is indirectly a measure of the induced change in military capability.

2.7 Military power, the Modern system view

The modern system is a tightly interrelated complex of cover, concealment, dispersion, suppression, small-unit independent maneuver, and combined arms at the tactical level, and depth, reserves, and differential concentration at the operational level of war. Taken together, these techniques sharply reduce vulnerability to even twenty-first century weapons and sensors. Where fully implemented, the modern system damps the effects of technological change and insulates its users from the full lethality of their opponents' weapons. [29, p. 3]

The concepts presented so far are ontological and give no real clue as to how the components of capability interact – especially if you are interested in the effects of technology change. That is why Stephen Biddle's Modern System theory is interesting. In his book *Military Power* [29] he views military capability as the military dimension of power and claims it can be understood as a function of the interaction between *Force employment*, *military technology* and *Preponderance*. Force employment comprises tactics, doctrine, skill, morale and leadership, and Preponderance can be understood as mass, or force numbers. By using a mix of qualitative and quantitative methods in case studies of past military conflicts, Biddle finds that after World War I the outcome of military land battle is determined by Force employment. His study shows that an actor having a modern system view (See the quote above) on the application of its forces can exploit properties of military technology. But, he claims, these have changed little after WWI. Consequently, in battle with a modern system opponent able to adapt its force employment, the effect of technology change is damped. On the other hand, in battle with a non-modern system army the effect of exploiting technology changes is often great due to an increase in the adversary's vulnerability. Increased preponderance, Biddle claims, only matters in battle between modern system armies. Increased preponderance in the non-modern system army only means increased risk of losses. The Gulf war in 1991 is one of the cases studied. The modern system theory explains why US assessments of own losses before the war was far off [29, p. 1]. Iraq in 1991 had an impressive army in materiel and numbers, but their force employment carried the hallmarks of a non-modern system army.

It is worth noting that Biddle's view on military power seems to harmonize with the collection of Warfighting capabilities concept above: "... military power (or "capability") itself can mean different things in different contexts. Military forces, after all, do many things, ranging from defending national territory to invading other states, hunting down terrorists, coercing concessions, countering insurgencies, keeping the peace, enforcing economic sanctions, showing the flag, or maintaining domestic order. Proficiency in one or

even several does not imply proficiency in them all: good defenders of national territory can make poor peacekeepers; forces that can defend national territory cannot necessarily conquer their neighbors.”[29, p. 5] He also acknowledges that one and the same capability is assessed very differently by different actors. One example: “Some would bomb an opponent for months to avoid losing friendly ground troops; others would invade quickly to shorten the war at the cost of heavier casualties.” [29, p. 5] When assessing the military utility of technology this is an important insight. Start by asking for whom you are doing the assessment [28].

Last, the Modern system theory applies to land battle. One can’t help to ask, are there similar relationships between force employment, technology change and preponderance in the airspace and maritime theatres?

3 SUMMARY

Table 1 presents the list of concepts and their respective features.

Concept	Analysis use	Design/Management use	Systemic character
Capability	limited, for relating to tasks	useful for accounting	none
Combat Power	limited, for overall comparisons	limited	none
Fighting Power	highlights non-material aspects	useful in strategic planning and in force production	as an effect from interaction between physical, conceptual and moral components
Joint Functions Also Warfighting Functions, or Elements of Combat Power.	highlights the need for balance in a force, or in a technical system, useful in identifying vulnerabilities	useful in force generation, in the dynamic design of an operation, and to support design choices in a technical system	constitute a generic first level in a hierarchical system view on capability
Warfighting Capability	highlights the variety of abilities in an actor’s armed forces, useful to focus assessments in the forecasting of the military utility of innovations	relates to a portfolio independent of potential adversary, useful in longterm force planning	constitutes the second and lower levels in a hierarchical system view on capability
DOTMLPF Also TEPIDOIL, or Defence Lines of Development, or Fundamental Inputs to Capability	highlights interdependence between material and non-material aspects in capability	serves to categorize warfighting capabilities, supports requirements management and evaluation in military capability development	constitutes an abstract conceptual system view on capability
Military Power – the Modern System view	provides a theory on the interaction between force employment, technology and preponderance in military capability, highlights non-material aspects and the effect of numbers	limited	as an effect from interaction between force employment and technology, under the influence of preponderance

Capability is a core measure of what matters in the military domain. This is why military capability is often at the heart of public or scholarly discussions. Unfortunately misunderstandings occur. No, doubt this is partly due to the fact that there are many different interests in, and views, on the subject, but also partly due to the fact that there is a large number of related and similar concepts brought in to the discourse by representatives of different professional and scientific disciplines (a good thing!). Some of the concepts commonly used in the military domain has therefore been described in an effort to increase awareness of their nuances. See Table 1 for a compilation.

Several of the concepts were evidently developed from a systems thinking point of view, although this is implicit in the respective definitions. Still, they differ in how useful they are

for analysis or design in different contexts. If your interest is in how requirements on weapon platforms have evolved within the capability of Combat Air Support since 1940, then perhaps you should choose the DOTPMLF(I) construct to study how the changes in operational context trace down to the interfaces between Materiel (M) and Doctrine (D), between Materiel and Training (T) etc. If your interest is in finding an explanation as to why Ukrainian soldiers were sitting on top of their Armoured Personnel Carriers instead of in them during the conflict with Russia-supported forces in 2014, then perhaps you should choose the Fighting-Power concept to study the interaction between physical and morale factors. Or, if you wish to address the question as to whether state X has the requisite variety in military capability to engage in conflict Y, then perhaps you should find support in the Joint functions or Military Power concepts. The bottom line is, if you always casually replace military capability with Warfighting functions then your analysis will only be interesting less than half of the time.

4 REFERENCES

- [1] Gerard O'Dwyer, "New Swedish government advocates for greater defense spending," *DefenseNews.com*, 12-Sep-2018.
- [2] Saab, "Missile systems." [Online]. Available: <https://www.saab.com/products/land/missile-systems>. [Accessed: 29-Sep-2020].
- [3] M. J. Henshaw *et al.*, "Capability engineering -an analysis of perspectives," *21st Annu. Int. Symp. Int. Counc. Syst. Eng. INCOSE 2011*, vol. 1, pp. 707–722, 2011.
- [4] H. Lindbom, H. Tehler, K. Eriksson, and T. Aven, "The capability concept - On how to define and describe capability in relation to risk, vulnerability and resilience," *Reliab. Eng. Syst. Saf.*, vol. 135, pp. 45–54, 2015.
- [5] H. Lawson, *A Journey Through the Systems Landscape*. College Publications, 2010.
- [6] Merriam-Webster, "Capability," *Merriam-Webster Dictionary*, 2016. [Online]. Available: <http://www.merriam-webster.com/dictionary/capability>. [Accessed: 02-Jun-2016].
- [7] Oxford-Learner's-Dictionaries, "Capability," 2020.
- [8] S. Axberg *et al.*, "Textbook in Military-Technology, vol. 9: Theory and Methods (Swedish)." Swedish National Defence College, 2013.
- [9] SEDU, "Subject description for Systems Science for Defence and Security, Feb 1st 2019," Stockholm, 2019.
- [10] Försvarsmakten, "Handbok målsättningsarbete förband (in Swedish)." Försvarsmakten, Högkvarteret, Stockholm, 2011.
- [11] NATO, "AAP-06 Edition 2018 NATO GLOSSARY OF TERMS AND CONDITIONS." NATO, 2018.
- [12] Department of Defense (DoD), "DOD Dictionary of Military and Associated Terms," *Jt. Educ. Doctrin. Div. J-7*, no. January, p. 382, 2020.
- [13] NATO, "Acronyms & Definitions," *Acronyms & Definitions*, 2019. [Online]. Available: <https://www.act.nato.int/acronyms#D>. [Accessed: 26-Jun-2019].
- [14] DCDC, "UK Defence Doctrine," *Joint Doctrine Publication 0-01*, vol. Novnber. The

- Development, Concepts and Doctrine Centre, Ministry of Defence, Shrivenham, pp. 1–83, 2014.
- [15] Sun Tzu, *The art of war*, Ebook edit. The Project Gutenberg, 1994.
- [16] C. von Clausewitz, *On War*, Ebook edit. The Project Gutenberg, 2006.
- [17] US Department of the Army, “Army Doctrine Publication No 3-0.” 2017.
- [18] NATO, “Nato Standard Allied Joint Doctrine,” *Allied Jt. Doctrin. Conduct Oper.*, no. February, p. 164, 2019.
- [19] Försvarmakten, *Militärstrategisk doktrin – MSD 16 2016*. 2016.
- [20] US DoD, “Directive 7045.20 Capability Portfolio Management,” 2008.
- [21] M. Fitzsimmons, “Whither Capabilities-based Planning?,” *JFQ*, no. 44, pp. 101–105, 2007.
- [22] J. Anteroinen, “Enhancing the development of Military Capabilities by a Systems Approach,” National Defence University, Helsinki, 2013.
- [23] SwAF, “Swedish Armed Forces development plan (in Swedish), HKV 23 320:52470, Annex 1.4,” Stockholm, 2011.
- [24] K. Nygren and J. Hård af Segerstad, “Försvarmakten: Styrning, spårbarhet och arbete med resultatindikatorer (in Swedish).” Försvarmakten, Högkvarteret, Stockholm, 2019.
- [25] INCOSE, *Systems Engineering Handbook*, 4th ed., no. January. John Wiley & Sons, 2015.
- [26] AUS MOD, “Defence Capability Development Handbook,” pp. 1–115, 2014.
- [27] Y. Yue and M. Henshaw, “An Holistic View of UK Military Capability Development★,” *Def. Secur. Anal.*, vol. 25, no. 1, pp. 53–67, 2009.
- [28] K. Andersson *et al.*, “Military utility: A proposed concept to support decision-making,” *Technol. Soc.*, vol. 43, 2015.
- [29] Stephen Biddle, *Military Power : Explaining Victory and Defeat in Modern Battle*. Princeton University Press, 2006.

APPENDIX 1 – SWEDISH CONCEPTS

Grundläggande förmågor

See *Joint functions, Warfighting functions or the Elements of combat power*

The Swedish strategic doctrine uses the equivalent of six joint functions called *Grundläggande förmågor* (Swedish for basic, or essential, capabilities in direct translation): *Underrättelser, Rörlighet, Verkan, Ledning, Uthållighet, and Skydd* (Intelligence, movement and maneuver, fires, command and control, sustainment, and protection) [19]. In the handbook on management in the development of military units – *Tillgänglighet* (Availability), a seventh Grundläggande förmåga, is added [10]. The concept is used in the handbook to make sure that a military unit under development is designed with all essential capabilities in mind [10, p. 21].

The difference between a function and a capability noted in the text above is unfortunately lost in the Swedish translation from Joint function to Grundläggande förmåga. Between Swedish speakers there is an obvious risk of misunderstanding.

Insatsförmåga

See *Warfighting capability*.

In Spårbarhetsmodellen (translated to Traceability model above), *Insatsförmåga*, the equivalent of a Warfighting capability, was defined as “a specific activity, for which resources have been acquired and trained, in order to achieve a desired effect that varies depending on scenario and ambition” [23].

After 2015 the Swedish portfolio of warfighting capabilities is no longer public and it seems the term *Insatsförmåga* is no longer used officially in policy documents.

Krigföringsförmåga

See *Fighting power*.