

## Using Effects-Based Thinking as an Alternative Method to Center of Gravity Analysis in the Planning and Execution of Military Joint Operations

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### Abstract

The Norwegian Armed Forces is taking part in military joint operations on an international basis. When planning and executing military joint operations, a knowledge management strategy known as center of gravity analysis is often used. Given the constant need to improve the processes involved in planning and executing military joint operations, the use of an alternative knowledge management strategy is proposed and discussed in this article. The alternative knowledge management strategy is referred to as effects-based thinking. Effects-based thinking can be said to be a more general method than the center of gravity analysis. For a professional community of practice such as the Norwegian Armed Forces, the use of effects-based thinking may simply be a more suitable knowledge management strategy.

**Keywords:** Knowledge management strategy; Center of gravity analysis; Effects-based thinking

### Introduction

The Norwegian Armed Forces conduct military operations in Norway as well as taking part in different military joint operations in other countries. This demands a high degree of knowledge management in the Norwegian military organization. Knowledge management is known as the process of capturing, developing, sharing, and effectively using organizational knowledge [1]. A framework for categorizing the dimensions of knowledge has been proposed. This framework distinguishes between the exploratory creation of "new knowledge", i.e., innovation, and the transfer or exploitation of "established knowledge" within a group, organization, or a community [2]. According to Bray [3], collaborative environments such as communities of practice can be used for both knowledge creation and transfer. As an organization in need of increasing their organizational knowledge, the Norwegian Armed Forces constantly seek to improve their knowledge management strategies. The planning and execution of military joint operations is an area where knowledge management as well as using the correct strategies is important. The Norwegian Armed Forces use a knowledge management strategy known as center of gravity (CoG) analysis in planning and executing military joint operations. This raises an interesting question, does there exist a better knowledge management strategy that can be used instead?

### COG analysis as a knowledge management strategy

Is the ability of the Norwegian Armed Forces to identify the correct CoGs crucial in order to achieve success in a military joint operation? This paper will discuss an alternative method that may be used instead of CoG analysis as a knowledge management strategy. CoG is a concept developed by the Prussian military theorist Clausewitz [4].

CoGs are those characteristics, capabilities, or localities from which a military force derives its freedom of action, physical strength, or will to fight. A CoG can thus be the opponent's leadership, system essentials, infrastructure, population, and/or military field units. The US Department of Defense Dictionary of Military and Associated Terms define a CoG as "the source of power that provides moral or physical strength, freedom of action, or will to act" [5]. In the Norwegian Armed Forces Joint Operational Doctrine from 2014, center of gravity (CoG) is defined as: "What gives an actor the overall power and strength that is essential for him to reach own objectives or be able to prevent others from reaching theirs" [6]. In the North Atlantic Treaty Organization's (NATO) publication AAP-06 [7], a center of gravity is defined as the characteristics, capabilities, or localities from which a nation, an alliance, a military force or other grouping derives its freedom of action, physical strength, or will to fight.

According to the US Army Counterinsurgency Field Manual 3-24 [8], the CoG in a counterinsurgency is the protection of the population that hosts it. The correct CoG is defined as a point one can and should attack with the intent to meet the strategic and political objectives and military end-state that applies to an operation. The Norwegian Armed Forces Doctrine for Air Operations defines end-state as the military condition that will prevail when the operation is terminated, i.e. when the target of the operation has been reached [9].

### An alternative knowledge management strategy: effects-based thinking

One may also ask if there are alternatives to the correct CoGs. Perhaps one may consider whether there are other ways to achieve the political and military end-state than through the use of CoGs. The initial question in this paper should perhaps be rephrased as: Are there alternative ways to plan and conduct military joint operations than to find the correct CoGs? Whatever the answer to this question, one must keep in mind that it is claimed that modern battlefields or conflict

areas are inherently different from before [10]. The modern conflict areas are characterized by different actors who do not fit into the normal picture of linear and symmetric conflict areas. Actor is here used to indicate any form of an opponent whether state or non-state, military or non-military in a conflict. An actor is thus everything from an opposing military force to local warlords in a conflict area. Examples of this are the ongoing conflicts in Afghanistan and Syria. The normal picture is usually with an opponent who is a state actor with a structured military force and civilian state system at their disposal, usually a nation. Russia would be an example of this.

Furthermore, knowing that the conflict areas are more complex than before, one might claim that finding the opponents' CoG or CoGs is more challenging than before. Past wars have usually been characterized as asymmetric wars where war between the actors has been recorded using different objectives, means and methods [10]. Today's low intensity conflicts are to a greater degree characterized by disorganization, and more different actors are involved with various strategic, political, religious and other objectives [11]. Actors can be defined as adversaries, and they can both regular and irregular forces, or terrorists and criminal groups [6].

To answer the initial question, a clarification of the different concepts used in this paper will be conducted. A discussion of using a knowledge management strategy known as effects-based thinking as an alternative to CoG analysis in the planning and execution of military joint operations will be done. Effects-based thinking is one of three approaches used by the Norwegian Armed Forces as an ideological basis of operational thinking. An ideological basis of operational thinking here refers to underlying thoughts and concepts of how to plan and conduct operations. The three approaches are, respectively, effects-based thinking, network-based thinking and maneuver warfare [11].

## Definitions of Concepts

The concept of gravity is defined on page 178 in the Norwegian Armed Forces Joint Operational Doctrine as "that which gives an actor a superior power and strength that will be decisive in order for him to reach his goals or to stop others from reaching their goals" (author's translation) [11]. A "center of gravity" is furthermore defined in Webster's Dictionary as "that point of an object at which its weight is evenly distributed or balanced, center of mass, point of equilibrium" [12].

According to the NATO's glossary of terms and definitions (AAP-6) [13], an operation is defined as "a military action or the carrying out of a strategic, tactical, service, training, or administrative military mission; the process of carrying on combat, including movement, supply, attack, defense and maneuvers needed to gain the objectives of any battle or campaign". A campaign is defined as "a series of military operations aimed to accomplish a common objective, normally within a given time and space" [14]. The concept of joint operations is defined in the Norwegian Armed Forces Joint Operational Doctrine on page 171 as: "An operation with efforts from several military branches are integrated and coordinated to achieve synergy effects at the strategic, operational or tactical level, often in a multinational framework and often coordinated with civilian instruments and actors" [11]. The synergy means that more power is gained from the combined parts than from the parts separately. NATO's definition of combined is defined in AAP-6 [13] as "joint". "Joint" is defined here as an adjective used to describe activities, operations and organizations in which

elements of at least two military branches participate. The objective of joint operations is to achieve synergistic effects by coordinating the various armed services [11].

The definition of the term "actor" reveals that it is broader than the traditional concept of an enemy, and includes enemy forces, civil society organizations, local communities, individual participants and representatives from the media [11]. "Planning" is defined as the preparations for the implementation of an action [9]. "Capability" is here understood as an individual's potential to influence the possibilities to perform a task and to acquire and apply new knowledge, skills and attitudes [15]. The concept of CoG is closely related to other concepts such as the concept of "end-state" [9], decisive points, and the terms "critical capabilities, critical requirements, and critical vulnerabilities" [16]. The concept of "decisive points" or "essential points" is defined in the Norwegian Armed Forces Joint Operational Doctrine as points from which one's own or the opponent's CoG can be threatened [11]. In a so-called structural analysis one will make use of all these terms [17]. However, due to this paper's focus on the concept of CoG and effects-based thinking, the discussion of the above-mentioned concepts will be limited and used only to answer the main question of the present paper.

It is customary to operate with four different levels, where one can have one or more centers of gravity on each of the various levels. The four levels are, respectively, the political, the military-strategic, the operational, and the tactical level [11]. Although the different CoGs at various levels usually will have a reciprocal relationship to each other, the discussion in this paper will focus on the concept of CoG and its importance in relation to the operational level. This is due to the article's focus on the planning and execution of joint operations, which normally occurs at an operational level [11]. The structural analysis method is a tool used for analyzing what constitutes the actors' CoGs. Furthermore, the method is a tool to decompose the actor's CoGs. The aim is thus to identify critical vulnerabilities among the actors [11]. The structural analysis will play an important role in the planning and conduct of operations. This is because the structural analysis helps to define the critical points on which an operational concept will be based [16]. In recent NATO publications and doctrines, an increased emphasis is put on effect thinking as an alternative method to using center of gravity. Another option could have been to use Clausewitz's [4] concept of "Schwerpunkt". The concept Schwerpunkt in German means focus, emphasis, or focal point in English. The Germans referred to a Schwerpunkt (here meaning focal point) when they planned their operations. The Schwerpunkt was thus the center of gravity where the point of the main effort should focus. This would then lead to the achievement of a decisive result as in winning over the enemy. A small force could then achieve a breakthrough at the Schwerpunkt and gain advantages by fighting in the enemy rear. The German Panzer commander Heinz Guderian referred to this achievement as kick them, don't spatter them (referring to the enemy), indicating the emphasis on the focal point and the main effort needed to achieve victory [18,19]. The main advantage of Schwerpunkt in relation to gravity is that the Schwerpunkt does not require an absolute knowledge of the actors' situation to succeed. In contrast to the gravity concept, the concept of Schwerpunkt focuses on the use of one's own forces at a tactical and operational level [20]. On the other hand, the concept of Schwerpunkt will be inadequate when it comes to analyzing and using non-military power to achieve the objectives of an operation. Schwerpunkt is still a useful tool for planning and conducting a joint operation or campaign. Schwerpunkt can be seen as an alternative to gravity, because the concept according to Vego [20]

can be used successfully in all forms of conflicts. However, it is too little adapted to the current conflict patterns to be used as an alternative to CoG analysis. The Norwegian Armed Forces is a community of practice, meaning a group of people who share a craft and/or a profession [21]. Deciding upon a common knowledge management system will therefore be crucial in obtaining success in planning and executing military joint operations.

### Problems Associated with CoG Analysis

The concept of gravity has a long tradition and history, and the gravity concept is at the heart of a popular strategic theory [22]. Gravity as a concept is linked mostly to Clausewitz [20]. The goal of taking advantage of gravity is to determine what the enemy's center of gravity is.

A central theme of Clausewitz [4] is that the CoG concept is closely linked to what the political objective of war or conflict at the strategic level is. In other words, it is extremely important that one is able to identify the correct CoGs if one wants an operation to be successful. Vego [20] argues, however, that Clausewitz never used the term gravity or "center of gravity" (CoG). Clausewitz utilized instead the term *Schwerpunkt* meaning "weight (or) focus of effort". An interesting point here may be that Clausewitz used the term *Schwerpunkt* almost exclusively in relation to the strategic level. One may wonder whether it is correct to use the concept of gravity at an operational level. This question can then be linked to the question of whether there are alternatives to using the concept of gravity in the planning and execution of joint operations. There may be several problems associated with the analysis of the actors' CoG in a modern conflict area. This is due to the increasing complexity of modern conflicts. A problem with identifying the involved actors' CoG is that actors can consist of irregular forces. The Norwegian Armed Forces Joint Operational Doctrine argues that irregular forces may include a full spectrum from well-organized insurgent groups, local warlords and their followers to criminal groups [11]. Common to irregular forces is that they want power and influence in the conflict area. They are rarely uniformed, and thus it is often difficult to distinguish them from the locals. They are often based on cell structures and organized in networks with a decentralized leadership. They usually tend to exploit the civilian infrastructure using mobile phones and Internet communication. They often use unconventional methods and pose a serious threat to a stabilization force. Combat against irregular forces is one category of assignments for the Norwegian Armed Forces in international operations. Today most of the combat that the Norwegian Armed Forces are engaged in are conducted towards such forces. The conflict level is generally higher than in peace support operations, though combat against irregular forces may also occur in a peace support operation [11,22]. Being able to identify the participants' CoGs is referred to by Strange and Iron [23] as an important strategic assessment. The ability to identify CoGs can thus be interpreted as being essential in terms of creating success of an operation. The CoG can be something physical or something linked to morale, and CoGs can exist on multiple levels simultaneously [24]. Being able to find and analyze the correct physical and moral CoGs in a planning phase of an operation will therefore be decisive in order to succeed with the upcoming operation. Clausewitz [4] has further argued that the moral elements are most important in a war or conflict. By undermining the moral CoGs, one will open up for success in an ongoing operation. It has also been claimed that to be involved in a conflict without having in mind both one's own and the opponent's CoG is comparable to

fighting blind. Sun Tzu [25] believed that one of the most important things is to know oneself and one's opponent. On the other hand, Eikmeier [26] thinks that it would be better to use the term "system" instead of "military forces" or "actors" when analyzing CoGs. One may here see a starting point for using effects-based thinking as an alternative method to achieve success in joint operations.

### Discussion

A question posed in this article is whether there exist other options than to use analysis of CoGs to achieve success in a joint operation. A simple answer to this is yes. At the same time, the modern battlefield is more complicated than before. It is therefore not certain that the existing alternative solutions are better than using a structural analysis with CoGs. One might argue that the traditional building blocks of an operational design do not fit when new operation patterns are planned and implemented.

An alternative way to achieve success in joint operations might be to use the effects-based thinking. Effects-based thinking can be seen as an approach that involves all assets, military and non - military means. The goal of effects-based thinking is to achieve certain desired effects [27]. Effect-based thinking can be said to underlie several other concepts, such as "Effect Based Operations" (EBO) and "Effect Based Approach to Operations" (EBAO) [11]. The British military use the term "comprehensive approach" instead of EBAO [11]. Recently, NATO has also begun to use the term comprehensive approach [28]. Effects-based thinking means to see one's own operations in a larger context. An effect is defined in the Norwegian Armed Forces Joint Operational Doctrine as a result or changes, often in the form of a behavioral change among opponents or other actors. A direct effect is a short term result - a direct result of the effort. An indirect effect is a longer term result. A distinction is also made between desirable and undesirable effects [11].

The purpose of effects-based thinking is that one's own efforts in an operation will function together with other military and civilian efforts. The goal of effects-based thinking is to focus on effects that will be inflicted upon an opponent or other actors. This is done in order to achieve the political and strategic objectives that lie at the heart of the conflict. Effects-based thinking is largely about analyzing oneself and the other actors that are involved in a conflict. The way to do this would be by considering the actors as complex systems. The next step would be to integrate all one's own instruments that can influence the different actors or systems. The purpose of effects-based thinking is to achieve effects in the whole or in parts of a system. The concentration is therefore focused upon achieving certain desired effects, and not in the effort or the effect itself. A success-filled EBO will depend on identifying the effects that lead to success in operations [29]. EBO used in its most extreme consequence will use all available means, i.e. diplomacy, information, military and economic instruments, a concept known as the DIME concept [27].

Effects-based thinking has been has come to the forefront of attention because of the complex conflicts that exist today, and an effects-based approach to operations (EBAO) is a philosophy used by many NATO nations [30]. The current NATO definition of EBAO is the following on page 2.2: "the coherent and comprehensive application of the various instruments of the Alliance, combined with the practical cooperation along with involved non-NATO actors, to create effects necessary to achieve planned objectives and ultimately the NATO end-state" [30]. As effects-based thinking will become more

and more used, this will probably involve an increased focus on the use of non-kinetic energy [31]. This is in line with the modern conflict field's complexity with many non-state actors. Effects-based thinking will also have the advantage in terms of planning and execution of operations that it takes into account indirect effects, both desirable and undesirable. A CoG analysis will have three levels from action to effect. The three levels are, respectively, critical vulnerabilities, critical points, and CoG [16]. An effects-based thinking approach may include many levels. One advantage of effects-based thinking is that it is based on state and non-state actors, and considers them as systems [11]. An effects-based planning of an operation can thus be considered a refined CoG analysis. Through an effects-based analysis one will at the same time obtain a generalization of CoG analysis [27]. This is because an effects-based analysis takes into account that there may be situations where it is not possible to identify the CoG. Thus, effects-based thinking emerges as a sensible alternative to CoG analysis in the planning and conduct of operations in today's complex conflict areas.

## Conclusion

The use of CoG has been shown to be important for the planning and execution of military joint operations. A prerequisite is that one is actually able to analyze one's way to the correct CoGs. Given that one can identify the proper CoGs this can be said to be a crucial and decisive factor in order to achieve success in joint operations. Given the complexity of the modern conflict areas or battlefields, it is not self-evident that the use of CoGs will lead to success in a joint operation. An alternative method of achieving success in the planning and execution of military joint operations is to use effects-based thinking instead of CoG analysis. Effects-based thinking can be said to be a more general method than the CoG analysis. One may argue that the use of CoGs can be seen as a means, while the use of effects-based thinking can be seen as a goal. For a professional community of practice such as the Norwegian Armed Forces, the use of effects-based thinking may simply be a more suitable knowledge management strategy for achieving success in modern military joint operations. However, it is important to remember that all knowledge transfer and collaboration occurs among human beings, so one should not lose track of the human component when discussing different knowledge management strategies [32].

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## References

1. Nonaka I (1991) The knowledge creating company. *Harvard Business Review* 69: 96-104.
2. Hayes M, Walsham G (2003) Knowledge sharing and ICTs: A relational perspective. In: Easterby-Smith M, Lyles MA (eds.), *The Blackwell Handbook of Organizational Learning and Knowledge Management*. Blackwell, Malden, MA, pp: 54-77.
3. Bray DA (2005) Exploration, Exploitation, and Knowledge Management Strategies in Multi-Tier Hierarchical Organizations Experiencing Environmental Turbulence. *North American Association for Computational Social and Organizational Science (NAACSOS) Conference*.
4. Clausewitz C (1976) *On War*, book eight, war plans. Princeton University Press, New Jersey, pp: 577-637.
5. US DoD (2016) Joint Publication 1-02. US Department of Defense, p. 29.
6. Forsvarsstaben (2014) *Norwegian Armed Forces Joint Operational Doctrine*. Norwegian Armed Forces Defence Staff, Oslo, p. 234.
7. AAP-06 (2013) *NATO glossary of terms and definitions*. NATO Standardisation Agency, Brussel.
8. US Army (2006) *US Army Counterinsurgency Field Manual 3-24*. US Army.
9. Forsvarets Overkommando (2002) *The Norwegian Armed Forces Doctrine for Air Operations*. Brødr Fossum A/S, Forsvarets Overkommando, Oslo.
10. Walter D (2005) *Symmetry and Asymmetry in Colonial Warfare, 1500-2000*. IFS Info, pp: 5-25.
11. Forsvarsstaben (2007) *Norwegian Armed Forces Joint Operational Doctrine*. Norwegian Armed Forces Defence Staff, Oslo.
12. Webster CA (1960) *Websters New World Dictionary of the American Language*. World Publishing, New York.
13. AAP-6 (2006) *NATO glossary of terms and definitions*. NATO Standardisation Agency.
14. D'Amura RM (1987) Campaigns. *The essence of operational warfare*. *Journal of the U.S. Army War College*, Parameters 18: 42-51.
15. Lai L (2006) *Strategisk kompetansestyning (Strategic competence management)* (2nd ed.). Fagbokforlaget, Bergen.
16. Strange J (1996) *Centers of gravity and critical vulnerabilities*. Marine Corps University.
17. FR 3-1 (2004) *Staff handbook for the Norwegian Army, the planning and decision process*. Norwegian Defence Staff and Command College, Oslo.
18. Bevin A (2002) *How Great Generals Win*. W.W. Norton, London.
19. Frieser KH (2005) *The Blitzkrieg Legend: The 1940 Campaign in the West*. Naval Institute Press.
20. Vego M (2007) Clausewitz's Schwerpunkt mistranslated from German-Misunderstood in English. *Military Review*, pp: 101-109.
21. Lave J, Wenger E (1991) *Situated Learning: Legitimate Peripheral Participation*. Cambridge University Press, Cambridge.
22. Echevarria II AJ (2004) CoG: Recommendations for Joint Doctrine. *Joint Forces Quarterly*, 35: 10-17.
23. Strange J, Iron R (2004) CoG: What Clausewitz really meant. *Joint Forces Quarterly*, 35: 20-27.
24. AJP-01(C) (2006) *Allied Joint Doctrine (C)*. NATO.
25. Sun Tzu (1989) *The art of war*. Shambala Productions, Boston.
26. Eikmeier DC (2004) *Center of gravity analysis*. *Military Review*, pp: 2-5.
27. Karlsrud Ø (2006) *Effect-based operations-a discussion of the concept and some initial thoughts on what this may mean for the Norwegian Defence*. Norwegian Defence Research Establishment note. Norwegian Defence Research Establishment, Kjeller.
28. AJP-5 (2006) *Allied Joint Doctrine for operational planning*. NATO.
29. *Maritime Warfare Centre* (2004) BR 1806 *British Maritime Doctrine* (3.ed). TSO, UK.
30. AJP-3.2 (2006) *Allied Joint Doctrine for Land Operations*. Ratification draft. NATO.
31. AJP-3.10 (2006) *Allied Joint Doctrine for Information Operations*. 4th study draft. NATO.
32. Dalton RA (2010) *Knowledge transfer for the military leader*.