

# WAR FIGHTING CAPABILITIES AND MILITARY-TECHNOLOGY INTERACTION

Norsell, M., Jäppinen, I.,  
Eliasson, P. and Silfverskiöld, S.

*Swedish National Defence College,  
Dr Kristinas väg 37,  
115 93 Stockholm, Sweden  
{martin.norsell, per.eliasson,  
stefan.silfverskiold}@fhs.se*

*National Defence University  
P.O.Box 7,  
FI-00861 Helsinki, Finland  
ilkka.jappinen @mil.fi*

In modern warfare the dependence on and interaction with technology is internationally undisputed. Starting from the currently used definition of the academic subject of Military-Technology in Sweden and Finland this interaction is analyzed with reference to Swedish and Finnish doctrine. An elaborate discussion is given about how progression in the subject of Military-Technology is achieved compared to other military sciences. This paper aims to highlight the current focus on command levels which might not necessarily be suitable for strengthening the war fighting capabilities. Finally, the Military-Technology connection and contribution to the war fighting capabilities will be discussed and emphasized. The shortcomings and pitfalls of the currently used methods will also be discussed. Furthermore, the necessity of having a Military-Technology perspective to increase quality and relevance in officers education will be stressed.

## Introduction

The usefulness of learning Military-Technology is sometimes disputed from officers at different levels. This paper focuses on showing the interaction between capabilities needed in war and the definition of the subject of Military-Technology. If this interaction can be shown using the major doctrines it might mean that officers with a Military-Technology perspective will be more versatile compared to their colleagues lacking this knowledge. N.B. Military-Technology is not to be mistaken for ‘technology for military purposes’.

Military-Technology is a relatively new academic subject and defined at SNDC as ‘*the interdisciplinary field that deals with military specific technology as well as with the impact of technology on tactics and operations.*’ [1]. This definition will be used throughout the paper, meaning that the subject of Military-Technology describes and explains how technology influences military activity at all levels and how the profession of an officer affects and is affected by technology. Furthermore, it will be assumed that achieving military effects by using technology without considering the context is unlikely to be successful in modern warfare.

## **The Finnish model and Military-Technology**

Finland's national defence is based on the idea of a comprehensive defence approach. The Government Security and Defence Policy Report 2009 provides a comprehensive evaluation of Finnish security and defence policy and lays down guidelines for the future extending into the latter half of the 2010s [2]. Securing the vital functions of society under all circumstances with a coordinated action between different sectors of society is the key object of total defence. The Government Resolution on The Strategy for Securing the Functions Vital to Society upholds national sovereignty, the security of society and the livelihood of the population in all security situations [3].

Main tasks of the Finnish Defence Forces (FDF) are

- (1) military defence of Finland,
- (2) supporting other authorities and
- (3) participating in international crisis management.

Focus is strictly on task number (1). Prevailing realities that must be taken into account are the vast area (per capita) defended, limited resources of the nation, overall globalization and Russia. Russia is seen as an enabler of economic growth and stability in North Europe *if* they succeed in domestic development.

Regarding military security of supply, the domestic defence industry is of vital importance to the Defence Forces. It is essential to guarantee domestic integration and maintenance capacities as well as crisis repair expertise. The vision of the Defence and security industrial strategy is 'The Finnish defence and security industry is specialized, competitive and networked in the international market. It contributes to security, national and international military capabilities as well as security of supply' [4].

Military-Technology is implicitly referring to materiel, and techniques using it, in warfare. Though, we must not forget that this includes the materiel and tactics of the possible invaders, too. Thus it is sometimes plain information, not the artifacts, that counts. For the above mentioned reasons Military-Technology is in Finland closely linked to Military Economics (a.k.a. Defence Acquisition) because of the central role of procurement of materiel and services. One commonly used method is Systems Engineering.

The limited resources have to be focused into the most cost-effective areas. For that purpose Strategic Competences and Critical Technologies are being surveyed – and repeatedly updated – in the Finnish defence. Currently target impact, situation awareness, command and control, force protection, digital networking and logistics are the strongest candidates. Even if domestic competences exist it is often more economical to procure off the shelf in the international market. The domestic industrial capacities are being directed by Technology Programmes. Their aim is to produce reports and demonstrators in the four key areas of enhanced situation awareness, future warrior's equipment, protection and datalinks.

## **The Swedish model and Military-Technology**

War fighting capability as it is described in The Swedish Strategic Military Doctrine is a state capability to conduct war fighting [5]. This capability is dependent of the states' military resources and the states' will to use these resources when needed. War fighting capability is built up by physical, moral and conceptual factors. Physical factors refer to personnel, equipment and other requirements necessary for military matters. Moral factors refer to the leadership and the morale within the Armed Forces. Conceptual factors refer to the doctrines and policies within the Armed Forces. That leads to the conclusion that Military-Technology has a vital role to play mainly within the physical factors and the conceptual factors.

War fighting capability can also be broken down into operational capabilities for the Armed Forces and for making the understanding for operational capabilities easier the theory of the basic capabilities may be useful. The theory of the basic capabilities is a model to describe basic needs and capabilities to reach military goals and effects at all levels.

The theory has no connection to military functions or systems but is supposed to show how basic capabilities must cooperate to reach a military goal or effect. The basic capabilities are Command and Control, Intelligence and Information, Action, Movement, Protection and Sustainability [6].

What is the purpose with each basic capability?

- The purpose with Command and Control is to coordinate human efforts so that the goal with the military activity is reached.
- The purpose with Intelligence and Information is to continuously maintain common situation awareness so that the goal with the military activity and planned activities is or will be reached.
- The purpose with Action is to reduce the opponents' capabilities through combat or willingness to conduct combat so that the goal with the military activity is reached.
- The purpose with Maneuver is using maneuvering systems, units and other resources so that the goal with the military activity is reached.
- The purpose with Protection is through technical and tactical-, active or passive measures to ensure own survival, sustainability and possibility to take action against an opponent so that the goal with the military activity is reached.
- The purpose of Sustainability is to maintain own personal and material availability so that the goal with the military activity is reached.

Given the fact that each basic capability is constituted by military units, each containing numerous technical systems ranging in complexity and having various effects, leads to the conclusion that Military-Technology has a strong influence on the resulting war fighting capabilities. Hence, both models described above concludes the same result.

## **Results**

Although the models used in Sweden and Finland are different an apparent relation between warfighting capabilities and the definition of Military-Technology has been found. More thorough research is necessary if this should be expanded into a theory, but it is the authors' belief that this research should be pursued and that the connection between warfighting capabilities and Military-Technology form a good starting point for a hypothesis. Conducting war successfully without using any technology in a military context seems highly unlikely in modern warfare.

Based on the Finnish and Swedish doctrines it is obvious that in order to successfully utilize war fighting capabilities Military-Technology must constitute a vital part of officers training. It should also be stressed that it is important *not* to confuse the academic subject of War Studies with officers training.

## **Discussion and challenges ahead**

### ***About progression in Military-Technology***

A common method to describe progression is based on the commanding levels. This is not suitable for the academic subject of Military-Technology as this would imply, if true, that it is only possible to do research on the strategic level. Using normal falsification, based on Popper, research is also needed on tactical level like e.g. the development of armored steel. Hence this is not a true model to describe progression in any subject related to war fighting capabilities [7].

Since Military-Technology is defined as a multidisciplinary subject the suggested approach is based on the increasing level of complexity. A hands on example could be the Global Positioning System (GPS), which could be used as a navigation tool on the tactical level considering different kinds of jamming and countermeasures [8]. On the strategic level, the introduction of Galileo could be studied [9,10]. Hence, GPS could be studied on basic, advanced and postgraduate level depending on perspective and level of complexity. The definition of Military-Technology is important to remember as well as the focus on military usefulness.

It is also important to design the education in a way that methodology is in focus and not only the details [11]. The methodology must be taught in its context for a few cases and not stop and leave out all the 'nitty-gritty' details. There is a fine line between presenting a 'cut-n-dried' solution and presenting things that really teach the students something useful. An illustration of this idea is shown in Figure 1 below. The dashed line presenting 'normal' teaching where much of the subject is covered but the depth is based on the lecturers' personal knowledge and interests. The solid line presents an alternative approach where most of the subject is covered in less depth but some part are taken further and focusing on teaching the methodology. This is partly based on the devise 'coverage is the enemy of understanding' [12], and partly on the ever-shrinking time to cover an interesting subject. It should be stressed that higher-level education aims to give students necessary tools for solving generic problems, i.e. with an increased *level of complexity*. It is impossible, a priori, to tell which assignments future officers and students will have. Hence, explicit knowledge in a specialized subject is of limited or no use. It is also of utmost importance to teach the inherent limitations of any system from a Military-Technology perspective [13].

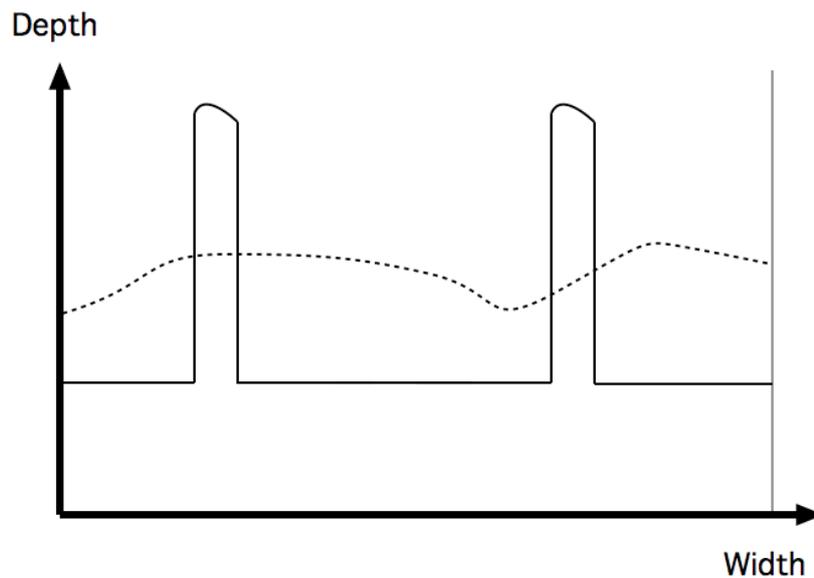


Figure 1: A model for increased learning efficiency

### ***Some methodology issues in Military-Technology***

When technology for military purposes is taught the basis is often engineering or natural sciences. A common way of solving problems is to restrict the problem (isolation/simplification) to something that is solvable. This is usually suitable for technology development when the context is relatively static and predictable. Using the same methods in military context is usually less wise since the opponent easily changes tactics to conquer any technology advantages. In a way, it is like playing chess and only spend time to make the best next move without considering the effect of the opponent [14]. Hence, a blend of methods are needed to find the best solutions for Military-Technology issues. This is a field that needs further research.

### **Conclusion**

Using the definition of Military-Technology as *'the interdisciplinary field that deals with military specific technology as well as with the impact of technology on tactics and operations.'* it has been shown that the war fighting capabilities and Military-Technology interaction is strong, based on the Swedish and Finnish doctrine. Hence, in order to successfully utilize the war fighting capabilities of the respectively countries Military-Technology must be a vital part of officers training.

Progression in the interdisciplinary subject of Military-Technology could be based on level of complexity, but further research is needed. Using commanding levels as a measure of progression is not suitable.

It is noteworthy that most officers feel comfortable when Military-Technology is presented as a way to focus technology towards "military usefulness". More research is required to state that this is a possible way to span the "gap between academia and profession". But the above mentioned

definition must be further communicated in the Armed Forces and not only in the academic institutions.

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