Effects-Based Operations and the Age of Complexity

A Critical Reflection

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> *[...] to discover the situation, such as it is, in spite of its being surrounded by the fog of unknown; then to appreciate soundly what is seen, to guess what is not seen, to take a decision quickly, finally to act with vigour, without hesitation.*
>
> *Von Moltke*

Introduction

This article deals with a very fashionable force employment concept that has gained widespread attention over the last one and a half decade. By being subdivided into three distinct, though interrelated parts it aims at a critical reflection of effects-based operations. Part one introduces the concept proper. It gives a brief overview of the genesis of effects-based operations together with its nature and basic tenets.

The second part analyses the current international security environment. The reason for doing this is to establish a background upon which it becomes possible to reflect effects-based operations. The last and closing part analyses to what extent the basic tenets of effects-based operations suit the identified challenges of the international security environment within the Western armed forces have to perform their tasks and missions.

An Enduring Concept

The term 'effects-based operations' first appeared during the successful 1991 war against Iraq. The American-led coalition forces achieved an unexpectedly fast and stunning victory that surprised even the most optimistic analysts. The world, expecting a rather bloody and protracted campaign against the then fourth largest military power of the world, witnessed a war fought at lightning speed and with limited casualties on the side of the coalition.

The incredible potential of advanced technologies such as stealth platforms and precision weaponry was shown in CNN footages worldwide. Soon a military paradigm was born, which heralded a new era in war-fighting. Defence analysts and members of the armed forces have praised ever since the importance of achieving effects on the enemy and disregarded the necessity of large-scale destruction.

> Effects-based operations are for many synonymous with Western, especially American technological superiority.

Over the years the concept turned so durable and promising that it enriched more and more the mainstream military vocabulary. Terms such as effects-based thinking, effects-based targeting, effects-based approach, effects-based planning, effects-based execution and effects-based assessment can be regarded nowadays almost as commonplaces.

The idea of waging war based on effects-based principles has eventually reached also the highest echelons of political and military leadership. As a senior NATO general expressed during a conference:

> *we must think in terms of achieving the desired effects. We must transition from attrition-based force on force warfare to effects-based operations.*

Also armed forces outside NATO try to move increasingly into an effects-based direction. The Israel Defence Force chief of staff emphasized in an interview that force transformation issues must focus less on force and power but more on effect.[1]

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1 Quotation in Ralston, Joseph: *Keeping NATO's Military Edge Intact in the 21st Century,* Luncheon Address, given at the NATO/ GMFUS Conference, Brussels, 3 October 2002, Internet, accessed 15. 12. 2004, available from http://www.nato.int/docu/speech/2002/s021003d.htm; Hughes, Robin: *Interview, Lieutenant General Moshe Ya'alon, Israel Defence Force Chief of Staff,* Jane's Defence Weekly, 17 November 2004, p. 34.



A BGM-109 Tomahawk Land-Attack Missile (TLAM) is launched towards a target in Iraq during Operation Desert Storm, 1991
(Photo U.S. Department of Defense, Henderlite; source NIMH)

Theoretical Assumptions

Most of the assumptions about effects-based operations are promising. Advocates claim that operations will be short and decisive, involving limited destruction and few casualties. Thus effects-based operations make it possible to save precious resources and are politically correct. Although there is no coherent theory of effects-based operations, a comparative analysis of seven approaches revealed that the foundation upon which the concept is built can be characterised by three common elements.[2]

Three elements

The first element, as the name implies is the focus on achieving effects. This emphasizes the exploitation of cause and effect strains in operations. Thus causality allows for the direct translation of strategic objectives into tactical actions. The second element concerns enabling technology, which not only makes it possible to achieve information dominance over the enemy but also the realization of a transparent battlefield.
The third element of effects-based operations is systemic approach. It is stated that an analytical decomposition of the enemy into ever finer details, together with the application of various operations research techniques make it possible to detect critical vulnerabilities. Affecting such criticalities is seen as leverage, which helps attain predefined effects within the enemy's system.

However, the aforementioned comparative analysis also revealed that the assumptions upon which the concept is built bear dangerous simplifications regarding the nature of war. It became also clear that as of now the three elements are scarcely more than loose hypotheses with only scattered practical evidence.

Disturbing aspects of war

The focus on direct causality emphasizes almost exclusively the strategic level of war and similar to the mainstream literature on the Revolution in Military Affairs also advocates of effects-based operations do not pay attention to the tactical level.

> The common belief is that advanced technologies make it possible to look at the whole and neglect the particular.

Also disturbing aspects of war such as confusion, surprise and novelty can be left aside since the supporting analytical processes can turn war into a logical, neat and digestible activity.

Unfortunately, the international environment is complex and dynamic, and there are no signs that this will change any time soon. Complex interactions however, mean that minuscule causes can generate disproportionate effects, which fact denies the possibility of predicting outcomes with any great certainty. Complex challenges require equally complex answers and a concept that aims at simplifying instead of addresing problems can therefore become a dangerous fallacy.

Current International Securiry Environment

Due to the multitude of players and motives involved the international environment, which followed the collapse of the Soviet Union can best be described as the age of complexity. It has been shaped by several forces and tendencies, such as revolutions in information-related technologies, continuous and often bloody geo-strategic restructurings, and various man-made or natural environmental disasters.
The resulting multitude and variety of challenges form complex contingencies occurring usually in failed states



2 Jobbagy, Zoltan (Maj.): *Wars, Waves and the West: Putting Effects-Based Operations into Context,* TNO Defence, Security and Safety, TNO-DV1 2004 B077, May 2005, pp. 49-52.

with collapsed institutions and anarchy. They tend to unfold in the less or least developed parts of the world mostly displaying characteristics of earlier ages. In case fighting erupts there is a rare involvement of regular armies since arms and tactics employed allow only for a low intensity of operations.

Complex contingencies

From a Western point of view complex contingencies often blur the boundary between war and crime, thus posing significant challenges. The West traditionally makes a distinction between civilized and savage warfare. Whereas the former is assumed to be instrumental, rational, and directed, the latter is often seen as existential, irrational, and aimless.[3]

> Waging war depends for the West traditionally more on technology and wealth than on manpower and ideology.

The emphasis is on short and sharp campaigns won with as few as possible casualties.



A Tomahawk cruise missile is launched during Operation Desert Storm, 1991
(Photo U.S. Department of Defense, Cooper; source NIMH)



Marine artillerymen from the 2nd Marine Expeditionary Force fire their M-198 155mm howitzer in support of the opening of the ground offensive to free Kuwait during Operation Desert Storm, 1991
(Photo U.S. Department of Defense, J.R. Ruark; source NIMH)

Western armed forces are also hardly ever driven by religious zeal. Unfortunately, in complex contingencies the traditional Western understanding of war as the clash between hierarchically structured regular armed forces fighting for secular political reasons does not apply. During the last one and a half decade the world also witnessed the rise of non-state actors possessing military power comparable to that of smaller states.

The democratization of technology and the resulting privatisation of war enabled such actors to play a larger role in international politics. They are not only more lethal but also increasingly powerful. The growing number of black holes or ungoverned territories within a number of weak states is worrisome too. They provide safe havens for such actors appearing mostly in form of various international terrorist and criminal organizations.[4] Although they are often driven by cultural and religious motives, their intention bears political consequences.

Anti-systemic terrorism

In order to describe their character and nature, often the term anti-systemic terrorism is used. Anti-systemic terrorists are mostly non-state actors or state-sponsored actors who aim at changing the international system. In world-wide large scale attempts they attack mostly civilian and government targets. The collapse of the twin towers of the World Trade Center in 2001 meant that war and terrorism merged. The results are deadly actions with terrifying effects, which further increase the already considerable threat to international security.

Also the chance to have diametrically opposed civilizations grows.[5] The declaration of the American President George W. Bush on 20 September 2001 made war a general phenomenon fought interminably and on a global scale, which:

3 Coker, Christopher: *Waging War Without Warriors, The Changing Culture of Military Conflict,* IISS Studies In International Security, Lynne Rienner Publishers Inc, 2002, pp. 6-13 and pp. 30-38.
4 Nye, Joseph S. Jr.: *U.S. Power and Strategy After Iraq,* Foreign Affairs, July/August 2003, pp. 62-63.
5 Wijk, Rob de*: The Art of Military Coercion, Why the West's Military Superiority Scarcely Matters,* Mets & Schilt, 2005, pp. 170-184.

[would] not end until every terrorist group of global reach has been found, stopped and defeated.

The effort however, to fight terrorism globally has turned war into a perpetual and indeterminate phenomenon with no clear distinction between the state of peace and that of war.

Thus war's traditional dimensions blur both in space and time.

The enemy to defeat is elusive and abstract as it operates outside the traditional boundaries of a nation state. He is no longer a comprehensible and localisable entity but one whose nature is fleeting and difficult to grasp.

An unknown and unseen enemy

The enemy is mostly unknown, unseen, and yet ever present. He poses a constant threat in which violence, criminality, and terrorism merge and become indistinguishable from another.[6]

As the example of Al-Qaeda shows anti-systemic terrorism tends to appear in networks distributed widely, variably, and unevenly. Due to such elusive nature, the enemy can appear anywhere and strike anytime.

As the recent bombings in Madrid and London showed, such an amorphous multiplicity can deliver a considerable punch at a single point from all sides and then disperse in the environment as to become almost invisible. Defeating such networks requires the conduct of complex contingency operations.

This effort however, is similar to that of fighting guerrillas but on a global scale. It is inherently difficult, in some cases even impossible and can drag soldiers easily into *vague, confusing military actions* in which they have to master *each messy situation and pull everything together.*[7]

6 Quotation in *Address to a Joint Session of Congress and the American People,* United States Capitol, Washington D. C., Internet, accessed 03.08.2005, available from www.whitehouse.gov/news/releases/2001/09/20010920-8.html; Negri, Antonio/Hardt, Michael: *Multitude, War and Democracy in the Age of Empire,* The Penguin Press, 2004, pp. 3-21 and pp. 30-32.

7 Zinni, Anthony C.: *A Commander Reflects, What will be the operations of the future?* Proceedings, July 2000, pp. 34-36 (quotations on p. 34).



Abrams main battle tanks and other armoured vehicles line a pier in preparation for redeployment to the United States in the aftermath of Operation Desert Storm, June 1991 (Photo U.S. Department of Defense, G.W. Butterworth; source NIMH)

Complex contingency operations require the co-ordination of multiple actors and contain a multitude of challenges and tasks. Unfortunately due to such nature detecting decision-points that can help develop useful strategies is very difficult.

Fragmented Wars

The wide variety of challenges have already resulted that wars of the outgoing 20th century were neither decisive nor heroic. For the West they were messy, confusing and distant, often embarrassing both to those who experienced and those who observed. In earlier ages wars of this kind often held off large armies when the cost seemed too high or the gain too small for the empire builders.

Western expansion and colonialism later proved that such primitive and imperfect warfare could not defeat modern armies supported by advanced technologies and organisation. In the context of complex contingencies however, political and psychological factors can predominate over military ones. Advanced technology has the potential to alter the man-machine interface.

Dependence on technology

Many signs indicate that at least for the West, the role humans have traditionally played in war is changing. Technological advances have already displayed that even conventional weapons can have unconventional effects.[8] Increased dependence on technology however, means that fighting can go beyond human comprehension as the battlefield has become both extended and constrained at the same time. As a real-time experience war penetrates into households by proliferating directly through the media and the Internet.

However, it is also constrained as the full fury is reserved to kill boxes and carefully selected targets. The recent past has also shown that even actions that may appear insignificant need political preparation and justification. Thus despite the asymmetry in terms of technological means often the best Western armed forces can achieve is not to lose militarily. Complex contingency operations are by definition asymmetric. They are inherently political, where the enemies understand victory rather as hurting than defeating superior Western forces.[9]

Complex contingencies can only be won politically although the enemies have not only the motivation but increasingly the resources to shape the world in a non-Western fashion. Various guerrilla wars of the 20th century from Algeria through Vietnam and Afghanistan have already shown that wars can be lost militarily but won politically.

Waging wars

Still, traditional Western military thinking cannot understand that given its technological superiority and the outstanding education and training of its personnel, why do enemies launch



Example of the leaflet recently (2001) dropped from U.S. aircraft over Afghanistan during Operation Enduring Freedom
(Photo U.S. Department of Defense; source NIMH)

8 Gray, Chris H.: *Postmodern War, The New Politics of Conflict,* Routledge London, 1997, pp. 21-23, p. 81, pp. 155-158, pp. 168-177 and p. 196; Kellner, Douglas: *Postmodern Military and Permanent War,* in: Boggs, Carl (ed.): *Masters of War, Militarism and Blowback in the Era of American Empire,* Routledge, 2003, pp. 229-244 especially pp. 230-235.

9 Hanson, Victor D.: *Postmodern War,* City Journal, Winter 2005, Internet, accessed 08. 03. 2005, available from www.city-journal.org/html/15_1_postmodern_war.html

wars they cannot win based on rational calculation.

However, the tides seem to change and the recent insurgency in Iraq shows that in a globalised world traditional factors such as gross national product, research and development capabilities, organisational and management skills become less and less the decisive factor for waging war.[10] For sure as time passes by new styles of war emerge but they often have to coexist with old and almost extinct ones. Probably one of the most striking paradoxes of our age is that

> unlike during most of human history the outdated, the poor and the obsolete can defeat strategy that exploits all means advanced technology can offer.

The age of complexity can be understood as transitory period. It seems so that from an era in which the actual use of military force was the central element of statecraft we move towards an era in which both non-military instruments of national power and the non-traditional use of the military force will dominate the statecraft.[11]



US Air Force personnel prepare an USAF B-2 Spirit aircraft for deployment in support of Operation Iraqi Freedom, 2003
(Photo U.S. Army, M.R. Nixon; source NIMH)

Global Warriors are back

Another reason why complex contingencies are so confusing and difficult to grasp is that unlike in the West many of the world population experience fighting wars and having a warrior-like existence as an increase of social status and recognition. For them the old rules of interstate warfare do not apply. They fight for shadowy and loose organisations that require a tribal-like identity but not any form of citizenship.

During its past also the West witnessed such creatures who could get access to wealth only through wars and had nothing to loose but everything to gain.
Thus conducting complex contingency operations means also experiencing the past, as coming wars will be more spontaneous and undisciplined fought by bands resembling rather gangs than armies.

Furthermore, the conduct of such operations will probably also be influenced by resource scarcity and planetary overcrowding. This environment however, makes it extraordinarily hard to achieve any sort of strategic or decisive effects aimed at influencing thinking and behaviour. Thus it seems so that at the turn of the 21st century the nearly extinct species of the warrior is back globally *as brutal as ever and distinctly better-armed*. Warriors generally prefer to fight without written and customary rules. Since war provides them with leisure, wealth, recognition and camaraderie they experience the end of fighting as the end of the good times.

> Their wars are also interwoven with various moral and religious elements, which often lack temporal and spatial limitations.

A human archetype

Thus we can have the impression that *technologies come and go, but the primitive endures* and the warrior resembles a fundamental human archetype.
They have no stake in peace and see no advantage in status quo. They thrive on disorder and any confrontation with order makes them shrivel.[12]

10 Handel, Michael I.: *Clausewitz and the Age of Technology,* in: Handel, Michael I. (ed.): *Clausewitz and Modern Strategy,* Frank Cass, 1986, p. 82-85.

11 Tucker, David: *Fighting Barbarians,* Parameters, Summer 1998, pp. 69-72; Foster, Gregory D.: *The Postmodern Military, The Irony of 'Strengthening' Defense,* Harvard International Review, Summer 2001, pp. 24-25.

12 Peters, Ralph: *The New Warrior Class,* Parameters, Summer 1994, pp. 16-26 (quotation on p. 28); Peters, Ralph: *The Culture of Future Conflict,* Parameters, Winter 1995-96, pp. 18-25; Peters, Ralph: *Our New Old Enemies,* Parameters, Summer 1999, pp. 22-37 (quotation on p. 22); Pendall, David P. (Maj.): *Effects-Based Operations and the Exercise of National Power,* Military Review, January-February 2004, pp. 20-21.



A Tomahawk cruise missile is launched from the USS Philippine Sea in a strike against al Qaeda terrorist training camps and military installations of the Taliban regime in Afghanistan, 2001
(Photo U.S. Navy, T. Cosgrove; source NIMH)

Al-Qaeda seems to herald this type of new warrior who takes advantage by being dispersed and avoids decisive engagements in traditional terms. The gap is graphically displayed in Iraq where we can witness:

> *an increasing disparity between [the] traditional vision of a 'kinetic kill' and the remaining effects to be achieved.*[13]

Although the motives and driving factors behind Osama Bin Laden and his followers may reflect the vocabulary and mentality of ages past but the way they wage war seems to be successful against the more powerful forces they oppose. Thus the enemy to defeat will neither have traditional centres of gravity nor the sort of resources that can be destroyed by state-of-the art weaponry.

A grey zone

The conduct of complex contingency operations is often both confusing and paradox as soldiers might experience situations where various fragments of earlier war forms are cobbled together and backed by modern technology. They fall into the grey zone between war and peace where achieving complete victory even with full spectrum dominance might become scarcely possible. They require a full-time commitment but offer only prospects for a provisional, modest and always fragile form of order and control.

In complex contingencies the relationship between ends and means might be clear at the strategic level, but they become considerably less clear as specificities emerge and more ambiguous as the range of military problems and options expands.[14]

Thus complex contingency operations make it increasingly difficult to link military means with political ends, tactical actions with strategic objectives directly. It is also not always possible to identify, penetrate to and destroy the enemy's very centres of gravity. All these mean that it is inherently difficult to achieve quick and decisive victory in the psychological domain by collapsing the enemy's system from inside-out.



Iraqi Army and U.S. Army soldiers secure a landing zone after departing from a UH-60 Black Hawk helicopter during an assault mission in Iraq near the Syrian border on March, 2006
(Photo U.S. Air Force, A. Allmon; source NIMH)

13 Dunlap, Charles J. (Jr.): *21st Century Land Warfare: Four Dangerous Myths,* Parameters, Autumn 1997, pp. 27-37; Chisholm, Donald: *The Risk of Optimism in the Conduct of War,* Parameters, Winter 2003/04, pp. 114-131; Quotation in Read, Robyn: *Effects-Based Airpower for Small Wars,* Air & Space Power Journal, Spring 2005, Internet, accessed 17.08.2005, available from www.airpower.maxwell.af.mil/airchronicles/apj/apj05/spr05/read.html

14 *A Defining Moment in Marine Corps History*, Interview with Gen. Charles C. Krulak. Internet, accessed 15. 08. 2005, available from www.navyleague.org/seapower/krulak_interview.htm

In fighting warriors information superiority and technological sophistication might be useful enablers but not the ultimate leverage. Without temporal and spatial limitations fighting such enemies can be fleeting from the causality point of view, virtual from the technological point of view, and meaningless from the systemic point of view.

Thus assumed advantages of effects-based operations can mean no advantage at all.

EBO: suitable with identified challenges?

Effects-based operations reflect the general Western attitudes for waging war. Thus war is understood as the exploitation of technological advantage together with the efficient use of scarce resources, where capital can substitute for personnel. Effects-based operations depict war basically as a management activity with a clear cut beginning and a definite end.

As the various strategic theories of the 20th century show military thinkers and enthusiasts alike tried to find a theory of war that would allow quick and easy victories. They searched either for a certain method or a weapon that could control the enemy and at least in theory, they offered promising solutions.

It is enough to think of Douhet's 'command of the air', Liddel Hart's 'indirect approach', or Warden's 'strategic warfare'. Similar to effects-based operations also their ideas were fed by the desire to get rid of the predominant idea of physical attrition and annihilation. The West understands war more than ever as a rational activity. The example of effects-based operations shows that it is ready to sacrifice the means for the ends, whereas its enemies experience war basically as means without a clear and definite end.

Clausewitz warned of the difference between war on paper and real war. He was also aware of the nature of human mind, which always strives for principles and rules. However, as he argued the endless complexities of war did not allow for oversimplifications. For him war's complexity came not only from physical but also from psychological forces and their effects, which do not obey rules. Thus war involves uncertainty in the form of friction, which is nothing more than the *difference between aspirations and achievements, between expectations and reality.*

Friction however, indicates that confusion and frustration are inherent elements of war.

Regardless whether it appears as simple, compound or complex phenomenon friction will always hinder the formulation of goals and objectives, influence the means and methods, and betray perceptions and expectations.[15]

Effects-based operations attempt to exploit the synergy that comes from focusing on effects, exploiting technological prowess and applying analytical skills. Unfortunately, regardless the age mankind lives in and the technology it uses, wars often defy clear and neat ideas elaborated on the strategic level. Waging war is an act that has always been more than linking means with ends in a simple deductive fashion and detecting obvious causality on the strategic level in form of desired or decisive effects.

War is fought on a spatial and temporal continuum, which is as much a tactical as a strategic process. It is a violent and two sided contest where the outcome is highly contingent. It is also loaded with indirect effects and higher level consequences, which impede most attempts to develop useful analytical models in order to detect causality. Many factors are simultaneously at play in war, which can arise unexpectedly, stay hidden even far after the fighting has ended or remain forever in the dark.

As long as war is dominated by humans who have purposes, frailties, proclivities, interests, pretensions, rivalries and other limitations, friction will remain a significant part of it. Thus war is and remains a gamble where *friction, uncertainty, and confusion [...] are not superficial annoyances to be gradually eliminated* but an integral and dominant part of the game.

The conduct of war has been and will be based to a great extent on guesswork and intuition whatever sophisticated the supporting analytical toolset might ever become.
Friction also remembers us that accuracy in detecting cause and effect relationships based on objectivity, technological wizardry, and scientific analysis are unattainable ideas in war.[16]
Consequently, not only the challenges of our turbulent age but also the very concept of friction allow only for a rather low practical ceiling for effects-based operations.

15 Clausewitz, Carl von: *On War,* Wordsworth Classics of World Literature, Wordsworth Editions Limited, 1997, pp. 153-171 and pp. 175-180; Cimbala, Stephen J.: *Clausewitz and Chaos, Friction and Military Policy,* Praeger Publishers, 2001, pp. 199-209 (quotation on p. 209).

16 Watts, Barry D.: *Clausewitzian Friction and the Future War,* McNair Paper 68, Institute for national Strategic Studies, National Defence University, 2004, p. 53 and pp. 79-84; Knox, MacGregor/Murray, Williamson: *The Dynamics of Military Revolution 1300-2050.* Cambridge University Press, 2001, pp. 176-179 (quotation on p. 178).