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(Unintended) Effects Based Operations: Dealing with Secondary Effects

Topics:
Effects Based Operations
System of Systems Analysis
Operational Net assessment

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The calling notice for this symposium states that effects-based operations, and *transitioning into EBO-centric mindsets and planning* is an appropriate area for consideration by the event participants. Hence, EBO will provide the foundation of my discussion. However, EBO is far too expansive a concept to be addressed in a short presentation. Therefore, I will concentrate on a single element of EBO, specifically the phenomenon of the secondary effects or the consequences that our primary actions will inevitably produce. While the *law of unintended effects* is near universally recognized and accepted, means of dealing with it are not abundant, and it is often relegated to the "too hard" category.

I trust that it will shock no one that I have discovered a means for accurately predicting the secondary effects of coercive actions; a task has frustrated military planners since ancient times. Rather, I am proposing a systematic approach, based on a sound intellectual foundation, that has been subject of experimentation by the US and NATO. My modest claim is that a system of systems approach may have the potential to provide some ability to anticipate secondary effects. This is in keeping with the theme of this event, particularly exploration and adoption of Command and Control to meet the challenges of the 21st Century.

Effects Based Operations has been an element of US defense transformation for several years. More recently, NATO has considered adoption of some of its facets, under the designation of an effects based approach to

operations. Its most noted official promulgation was in The Bi-Strategic Commander Strategic Vision that was signed by Admiral Giambastiani and General Jones in late 2004. Within that 22 page document are14 reverences to the effects based approach. Keeping within the theme of this symposium track, and using the message gleaned from the Strategic Vision as a guide, I will conduct this presentation using an effects based approach. Since the concepts that enable EBO are numerous, and the time available here is limited, I will restrict my excursion to the area with which I am most familiar; that is, means for anticipation of secondary effects.

Effects should be derived from objectives. My objective is for you to understand the intellectual and logical foundations of an effects based approach and be able to recognize the importance of secondary effects to EBO. Consequently, this will allow you to intelligently question and critique my presentation. The desired effects to be achieved in the next 20 minutes are: (1) you are aware that nations, and some non-state actors, may be considered as complex adaptive systems; (2) you appreciate that an action taken to influence a complex adaptive system will also produce secondary effects; and, (3) you recognize the advantages of a system of systems analysis to effects based operations. Let's now move to achieving the first effect.

Effect #1: You understand that nations, and some non-state actors, may be described as complex adaptive systems

First, agreement on basic definitions is required. A system may be described as a "regularly interacting or interdependent group of items forming a

unified whole…under the influence of related forces."[1] Most of the essential components of modern societies may be depicted as *systems.* Sophisticated communications, transportation infrastructure, information management, manufacturing, distribution of resources, and health systems are but a few examples.

A systems approach has been applied to security issues to a larger extent; however, employment has been more often aimed at defense planning, and the development of offensive and defensive military systems, not specifically the analysis of the systems of potential adversaries. Among the areas where a systems approach has been proposed and utilized is in the concept of Network Centric Warfare in the U.S., and NATO's emerging Network Enabled Capabilities.[2] There is less evidence of effort aimed at applying these concepts to examinations of the individual and collective elements that comprise the set of a nation's assets and capabilities. One reason for this reluctance to adopt a systems based style include the daunting task of explaining and understanding the complex nature of national systems of power, and the absence of practical tools and approaches for such analysis. What are the possible explanations for this paucity of potential solutions?

Unlike many physical structures, national and international systems are nonlinear, complex, and at times, chaotic. There is no calculus, and there are no

[1] *Webster's New Collegiate Dictionary*, (Springfield, MA: G. & C Merriam Company, 1979), 1175.
[2] NCW is normally considered in the context of design of military command and control systems. James Moffat, *Complexity Theory and Network Centric Warfare* (Washington, DC: DoD Command and Control Research Program, 2003), 45, describes NCW as "an emerging theory of war based on the concepts of nonlinearity, complexity and chaos." Systems also are addressed in investigations into the use of airpower as a means of military coercion.

universal laws that can precisely equate cause to effect. Further complicating the analysis, these systems are dynamic and reactive. Hence, few would disagree that systems of power, even in the least technologically advanced nations may reasonably be described as *complex.*

When non-state actors, such as al Qaeda are thrown into the equation, the complexity becomes undisputed. Due to multiple interacting components of national power, viewing nations as a system is readily accepted. Additionally, there is little debate that nations are *adaptive*, that is, they react to external as well as internal stimuli. Hence, a portrayal of nations as *complex adaptive systems* (CAS) is not a radical departure from mainstream concepts.

Effect #2: You appreciate that an action taken to influence a complex adaptive system will also produce secondary effects

In the physical world, if the force applied to an object is changed, the laws of motion lead us to expect a commensurate alteration in the resultant velocity of the object. The effect of a standard cue ball, traveling at a certain velocity, impacting a grouping of solid and striped balls of known mass, at a specific angle of incidence, may be determined with some degree of accuracy if the environmental factors, e.g., wind velocity, temperature, humidity, etc, are known. And, importantly, the effects of the secondary collisions are calculable. However, there is no equivalent equation to predict with much confidence the consequences of state actions. The law of unintended effects remains in force.

Professor Robert Jervis of Columbia University presents the key challenge to the selection of alternatives when confronting a complex system. “To alter the

state of a system, it is necessary to understand the interaction of the elements that make up the system. It is impossible to change one element of the system without affecting the remaining elements."[3] This condition presents to decision-makers a virtually universal problem that lacks satisfactory solutions. This is a dilemma that adoption of an effects based approach seeks to address.

If an alliance increases the level of efforts of its actions, e.g., tightens a weapons or strategic materials embargo, there is not a precise means of determining if the resultant impact will increase proportionately, or even if there will be a variation at all. Additionally, the secondary or unintended effects of the action may work counter to the embargoing nation's objectives, e.g., strengthening, rather than weakening domestic support for the regime in the targeted nation.

Despite the lack of controversy on the depiction of nations as complex adaptive systems, acceptance of this characteristic of national power has not proven to be particularly useful. Perceived by some as little more than stating the obvious, any movement beyond simple agreement with the premise poses the important question: "so what?" The important issue remains whether or not this recognition of nations as complex adaptive systems presents any practical applications. Even if the models are accurate, can utilization of the components of these theories provide any realistic assistance to those who must make decisions in such an environment?

[3] Jervis, "Complexity and the Analysis of Political and Social Life," in *Complexity, Global Politics, and National Security, How Systems Work*, ed. David S. Alberts and Thomas J. Czerwinski (Washington: National Defense University, 1997), 582.

Effect #3: You recognize the advantages of a system of systems analysis to effects based operations

While a variety of methods may be employed, military force historically has been the primary instrument of national coercive power. The successful employment of a nation's, or alliance's, influence to this end requires, *inter alia*, an assessment of the net power differences. This in turn mandates some methodology for examination and understanding of the power capabilities of nations.

If power is thought of in purely military terms, such assessments become relatively simple. Force on force analysis is relatively linear, and is amenable to modeling and simulation. Hence, in many cases an assessment may be accomplished through relatively simple means such as a numerical summation of capabilities. Assessments of relative power during the Cold War often gravitated toward the counting of ships, aircraft, divisions, launchers, warheads and deliverable megatonnage.

However, in the current complex international environment, where the elements of national power are multifaceted and interrelated, the task of accurate assessment becomes exceptionally difficult, and the tools available for analysis are more limited. This is particularly true in the anticipation and comprehension of the secondary effects of actions designed to achieve objectives.

The previously mentioned Strategic Vision states, " Effective decision making requires a net assessment capability that harnesses the current political, military, economic, civil, information and infrastructure factors that affect all

actors."[4] While categorization is useful for descriptive purposes; such systems do not operate independently. Due to their size and complexity, the total structure and processes of a nation's capabilities may be better understood as a *system of systems*. The inherent complexity and interactions make this holistic system of systems different than merely an arithmetic sum of the subsystems. Hence, the challenge facing those who would utilize a systems approach becomes more problematic. Nevertheless, some intellectual energy has been expended in this arena, the most visible manifestations being the Operational Net Assessment (ONA) and System of Systems Analysis (SoSA) efforts contained within the Multinational Experiment series.

New or improved concepts and methodologies are important to decision-makers, as well as the analysts who support them, due to the acknowledged need to improve the ability to understand the secondary effects of actions. Recent applications of military power in Afghanistan and Iraq provide examples where actions designed to achieve desired effects in support of objectives, also resulted in secondary (unintended, unanticipated, undesired) effects that may or may not have supported these overall coalition objectives.

At this point I will provide a brief illustration of a SoSA, along with a case study to clarify the approach and provide a more readily understood example (duration, 5-7 minutes est).

[4] North Atlantic Treaty Organization, Supreme Allied Commander Operations/ Supreme Allied Commander Transformation, "Strategic Vision: The Military Challenge." 23 August 2004. The document "is not a directive, but is intended to inform, educate and stimulate debate within the Alliance and nations." 2.

The foundation of this premise is that a system of system analysis can provide enhanced understanding of the functioning of systems of power. This understanding will allow for improved comprehension of the linkages between units of the system and could contribute to better awareness of secondary effects of actions. This awareness can be a useful tool for those who must consider the alternatives in selection of actions and resources applied to achieve desired effects aimed at achievement of Alliance objectives.

This task is not new or unique to the geopolitical environment of the early twenty-first century. Consideration of the secondary effects of actions has been an element of relations between nations throughout recorded history. However, we may now possess the information processing tools that make this type of sophisticated analysis possible. The problems are not new, but the solutions are; and these may be found through concept development and experimentation as well as the lessons derived form ongoing operations.

While the net assessment and SoSA methodologies can only provide estimates of general patterns of behavior, any tool or process that can provide insight into these interrelationships is useful, and the potential for exploitation is worthy of concept development and experimentation.

While not a universal remedy for this problem of contending with secondary effects of actions, such a methodology may at least provide an awareness of possible secondary effects that could mitigate their deleterious impact. The inability to provide precise predictions of secondary effects does not

connote that the effort is not potentially important. "Some problems are just too complicated for rational, logical solutions. They admit *insights*, not *answers*."[5]

The justification for such a process is the need for a basic tool for decision makers to contend with the consequences of actions when dealing with complex systems of national power. This approach to improving the level of understanding is now possible due to the merging of new approaches to complexity and systems analysis with advances in computer processing and information technology capabilities. Additionally, the evolving nature of conflict, and the perceived decreased likelihood of symmetrical force on force confrontations gives further work in this area increased relevance.

I will conclude with a return to the question implied in the title: How can we deal with the phenomenon of secondary effects? I will evade a direct answer, but argue that we cannot afford not to deal with secondary effects. I have provided one approach. It is untested, and its implementation clearly presents myriad difficult challenges. To drive effects based operations to the capability described in the Strategic Vision we need an impetus. That effort should include continued CD&E to develop net assessment capabilities.

As those of you who have had ay exposure to EBO and EBP will appreciate, perhaps the most difficult issue is EBA – Effects Based Assessment. Determination of to what degree an effect has been achieved is a formidable task. Development of measures of effectiveness is intellectually challenging and typically frustrating. My measurements of effectiveness were: (1) there was no

[5] Emphasis added. Attributed to President Emeritus of MIT, Jerome B. Weisner in A. B. Cambel, *Applied Chaos Theory* (Washington: Academic Press, Inc., 1993), vi.

evidence of a mass exodus from the room during my presentation; (2) only a relatively small percentage of the participants fell asleep; and (3) the event organizers did not throw me off the platform. Hence, I will declare that all desired effects were achieved. I thank you for your attention, and welcome any comments or questions.