



**EFFECTS-BASED OPERATIONS VERSUS SYSTEMIC OPERATIONAL
DESIGN: IS THERE A DIFFERENCE?**

Graduate Research Project

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Abstract

Joint and Air Force doctrinal discussions, at least concerning planning of operations, has recently centered on Effects-Based Operations (EBO). Increasingly there is dissatisfaction with EBO, particularly from the U.S. Army and Marine Corps. As an alternative to EBO, some in the military are advocating the adoption of an Israeli planning concept Systemic Operational Design (SOD). After close examination of EBO and SOD, it becomes apparent that SOD is more like EBO, as currently defined, than the SOD advocates have articulated.

Acknowledgments

I would like to express my sincere appreciation to my faculty advisor, Lt Col Dave Denhard, for his guidance and support throughout the course of this research effort. The insight and experience was certainly appreciated. I would, also, like to thank Major Robert Umstead, Student, School of Advanced Military Studies, who provided access to much of the material concerning Systemic Operational Design.

Patrick E. McGlade

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EFFECTS-BASED OPERATIONS VERSUS SYSTEMIC OPERATIONAL DESIGN: IS THERE A DIFFERENCE?

I. Introduction

Background and Definitions

Effects-Based Operations (EBO) purports to be a holistic methodology for application of the four elements of national power: Diplomatic, Informational, Military, Economic. It utilizes a System of Systems (SoS) approach to view the enemy. Joint Warfighting Center Doctrine Pamphlet 7, defines EBO as:

Operations that are planned, executed, assessed, and adapted base on a holistic understanding of the operational environment in order to influence or change system behavior or capabilities using the integrated application of selected instruments of power to achieve directed policy aims. (JWC Pam 7, 2004:2)

EBO values information to provide a clear picture of the OE and seeks to create a predictive summary to enable the commander to make decisions and to develop a plan that avoids negative effects while creating the end state condition desired by the commander. It seeks to understand and eliminate negative higher order effects and when able take advantage of complimentary higher order effects.

A recent School of Advanced Military Studies monograph, “Systemic Operational Design: An Introduction” defines Systemic Operational Design (SOD) as:

...an application of systems theory to operational art. It is an attempt to rationalize complexity through systemic logic. SOD is a holistic approach that translates strategic direction and policy into operational level designs. SOD focuses upon the relationships between entities within a system to develop rationale for systemic behaviors that accounts for the logic of the system. SOD facilitates a cycle of design, plan, act, and learn. This is accomplished

through seven discourses, leading to a holistic design of an operation that will facilitate planning. (Sorrells and others, 2005:iv)

SOD values framing the problem and discourse to promote a thoughtful and iterative process to reach a solution, it places emphasis on adaptability and flexibility. It is human centric and its emphasis is in educating and developing leaders, emphasizing Operational Art almost to the complete exclusion of Operational Science. Its goal is to educate and develop decision makers so that SOD becomes reflexive.

Problem Statement

To the casual reader there does not appear to be a great deal of difference between EBO and SOD as defined above. An attempt to gain a true understanding of each will necessitate an in-depth development of the definitions above, examining in some detail the history that led to the development of each, key terms used, applications of each in general terms, and how they view the world they seek to influence.

In simpler terms does there exist a significant difference (as many in the Army and Marine Corps insist) between SOD and EBO. Is EBO merely a repackaging of Classical Elements of Operational Design or a refinement that takes advantage of increased information technology? Is SOD merely different terms, i.e., a rewording of the concepts espoused in EBO? If they are indeed different, can they coexist and must they?

This paper flows from definition of terms applicable to EBO and SOD to a comparison and contrast of EBO and SOD. The next chapter develops EBO and SOD and defines relevant terms. Following this development of EBO and SOD, the two

methodologies and their underlying theories are compared and contrasted. Finally, the conclusions are presented in the last chapter.

II. Literature Review

Overview

The development of doctrine is varied and complex, it draws from history, new technology and knowledge and is subject to debate, testing and, if found worthy, ends in acceptance. It is then continuously modified until such time as it is deemed no longer relevant at which point, hopefully, it is discarded. Therefore, the process is continuous and consequently completely defining the most current doctrine is an impossible task. With that important caveat in mind, this chapter will introduce the topic of Effects-Based Operations (which forthwith will be used synonymously for Effects-Based Approach and Effects-Based Planning) with information primarily gathered from the *Commander's Handbook for an Effects-Based Approach to Joint Operations* (2006), The Joint Warfighting Center Joint Doctrine Series, Pamphlet 7 (2004) and Joint Publication 3-0, *Doctrine for Joint Operations* (2001). Second, Systemic Operational Design is discussed based primarily on the School of Advanced Military Studies monograph, "Systemic Operational Design: An Introduction" (2005) and Shimon Naveh's book, *In Pursuit of Military Excellence: The Evolution of Operational Theory* (1997).

Effects-Based Operations

Definition

Operations that are planned, executed, assessed, and adapted base on a holistic understanding of the operational environment in order to influence or change system behavior or capabilities using the

integrated application of selected instruments of power to achieve directed policy aims. (Pamphlet 7 2004)

The reader should note the beginning to end definition of EBO, i.e. planning, execution, assessment and adaptation. Dictionary.com defines holistic as, “Emphasizing the importance of the whole and the interdependence of its parts” and “Concerned with wholes rather than analysis or separation into parts.” For EBO, this implies complete, as in all aspects of, but not perfect knowledge of the enemy as a system to include interactions between its subsystems.

History

The term Effects-Based Operations traces its origin back to the Gulf War of 1991, and it is widely credited as the reason for the successful operations in Iraq during 1991. Colonel Warden, and then Lt Col, now Lt Gen Deptula are generally considered the fathers of Effects-Based Operations (Berg 2006). EBO incorporates the ideas of parallel attack, system shock, maneuver warfare, rapid dominance and perhaps most importantly does away with the focus on attrition-based warfare (Deptula 2001).

Terms

Operational Level of War

The level of war at which campaigns and major operations are planned, conducted, and sustained to accomplish strategic objectives within theaters or other operational areas. Activities at this level link tactics and strategy by establishing operational objectives needed to accomplish the strategic objectives, sequencing events to achieve the operational objectives, initiating actions, and applying resources to bring about and sustain these events. These activities imply a broader dimension of time or space

than do tactics; they ensure the logistic and administrative support of tactical forces, and provide the means by which tactical successes are exploited to achieve strategic objectives (Joint Publication 3-0:GL 15).

Effect

“The physical and/or behavioral state of a system that results from an action, set of actions, or other effect” (EBA Handbook 2006:I-3).

System

“A functionally, physically, or behaviorally related group of regularly interacting or interdependent elements; that group of elements forming a unified whole. Systems associated with national security include political, economic, military, economic, social, informational, infrastructure, and others” (EBA Handbook 2006:GL-8).

GENERAL SYSTEMS THEORY				
	Level	Examples	Theory	
Complexity ↑ ↓	High	Symbolic Entities	Math, Grammar	Philosophy, Logic, Art
		Socio-cultural Entities	Governments, Families	History, Sociology
		Humans	Males, Females	Psychology, Physiology
		Animals	Mammals	Zoology
		Complex Organisms	"Plant-like" Organisms	Biology
		Micro-Organisms	Cells	Genetics
		Control Mechanisms	Thermostat	Cybernetics
		Clock Works	Conventional Machines	Newtonian Physics
		Static Structures	Atoms, Molecules	Chemistry
	Low			

Figure 1: General Systems Theory (EB Handbook Sup 1 2006:3)

Node

“An element of a system that represents a person, place or physical thing” (EBA Handbook 2006:GL-6).

Key Node

“A node that is associated with a center of gravity or an operational/strategic effect” (EBA Handbook 2006:GL-6).

Link

“An element of a system that represents a behavioral, physical or functional relationship between nodes” (EBA Handbook 2006:GL-6).

Effects-Node-Action-Resource (ENAR) Linkage

Visualization of the relationship between nodes, the action brought to bear on the node, the resource required to accomplish the action, the direct effect, and indirect effect. Indirect means the effects that the node acted upon produces in other nodes. These cascading or indirect effects may be desired or undesired. It is sometimes possible to model this linkage with some version of Lentief’s Input-Output Model. The Input-Output model is capable of analyzing these threats even though it is a linear program (Gallagher and others, 2005:11).

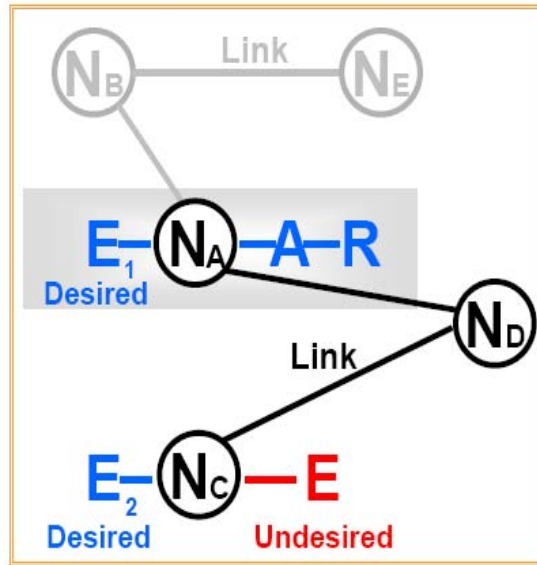


Figure 2: Effect Node Action Resource Linkage (JWC Pam 7 2004:15)

Center of Gravity

“The source of power that provides physical and moral strength, freedom of action, or the will to act” (EBA Handbook 2006:GL-3).

Joint Intelligence Preparation of the Battlespace

The analytical process used by joint intelligence organizations to produce intelligence assessments, estimates and other intelligence products in support of the joint force commander’s decision making process. It is a continuous process that includes defining the total battlespace environment; describing the battlespace’s effects; evaluating the adversary; and determining and describing adversary potential courses of action. The process is used to analyze the air, land, sea, space, electromagnetic, cyberspace, and human dimensions of the environment and to determine an opponent’s capabilities to operate in each. Joint intelligence preparation of the battlespace products are used by the joint force and component command staffs in preparing their estimates and are also applied during the analysis and selection of friendly courses of action. (EBA Handbook 2006:GL-5)

System of Systems Analysis

An analytical process that holistically examines a potential adversary and/or operational environment as a complex, adaptive system, including its structures, behavior, and capabilities in order to identify and assess critical factors and system interrelationships. (EBA Handbook 2006:GL-8)

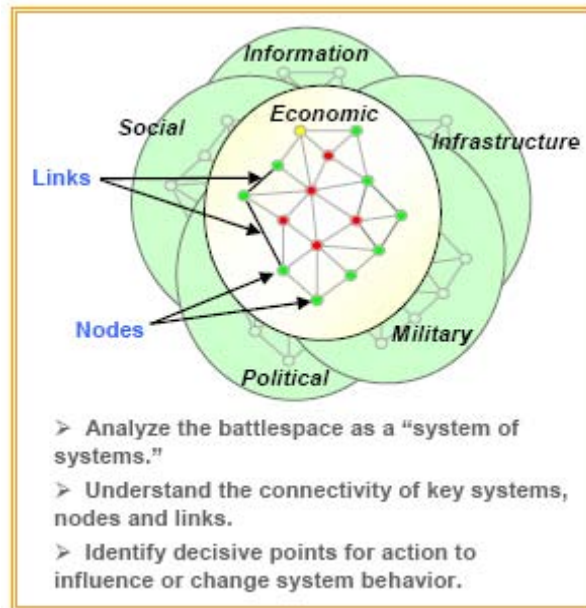


Figure 3: System of Systems View (JWC Pam 7 2004:10)

Objectives

"The clearly defined and attainable goal toward which every operation is directed" (EBA Handbook 2006:GL-6).

Task

"A directive statement used to assign a discreet action or set of actions to an organization that enables a mission or function to be accomplished. A single task may incorporate multiple individual actions" (EBA Handbook 2006:GL-8).

Course of Action

“Any sequence of activities that an individual or unit may follow” (EBA Handbook 2006:GL-4).

Measure of Performance

“A criterion used to assess friendly actions that is tied to measuring task accomplishment” (EBA Handbook 2006:GL-6).

Measure of Effectiveness

“A criterion used to assess changes in system behavior or capability that is tied to measuring the attainment of an end state, achievement of an objective, or creation of an effect” (EBA Handbook 2006:GL-6).

Strategic Control

“...the ability to dominate an adversary’s influence on strategic events—does not necessarily mean the ability to manipulate individual tactical actions” (Deptula 2001:5). Deptula further states, “...the goal of war is to have an adversary act according to our strategic interests” (Deptula 2006:Foreword). This highlights the requirement for national strategy to drive EBO and that the ultimate goal of EBO is strategic control.

Systemic Operational Design

Definition

An application of systems theory to operational art. It is an attempt to rationalize complexity through systemic logic. SOD is a holistic approach that translates strategic direction and policy into operational level designs. SOD focuses upon the relationships between entities within a system to develop rationale for systemic

behaviors that accounts for the logic of the system. SOD facilitates a cycle of design, plan, act, and learn. This is accomplished through seven discourses, leading to a holistic design of an operation that will facilitate planning. (Sorrells and others, 2005:iv)

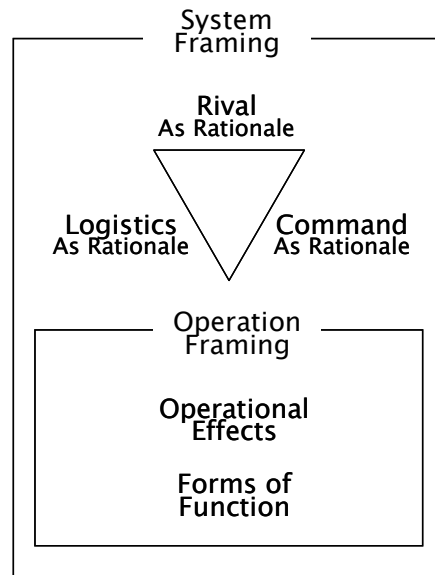


Figure 4: Systemic Operational Design Overview (Sorrells and others, 2005:23)

History

The history of Systemic Operational Design begins with Shimon Naveh's book, *In Pursuit of Military Excellence: The Evolution of Operational Theory*. Naveh examines over 200 years of pertinent military history and traces the evolution of current (1997) operational theory. In it, he lays the groundwork for the development of SOD. Currently Dr Tim Challans and others at the School of Advanced Military Studies are advocating adoption of the SOD methodology into Joint doctrine.

Terms

Planning

“The act or process of making or carrying out plans; to arrange parts of design; to devise or project the realization or achievement of; to have in mind” (Sorrells and others, 2005:52).

System Framing

“Grouping independent but interrelated elements into a unified whole” (Sorrells and others, 2005:53). This step is the first of seven in the SOD process. Here is where the problem is framed, i.e., all relevant knowledge about the enemy is sorted out. Those items that apply to the issue under review are included, this allows for a manageable problem domain. For example, a global view of the systems of even a small, undeveloped country would rapidly overwhelm anyone’s ability to study and comprehend them in their entirety. This step is then to frame the problem in manageable terms and thus sets the boundary for the discussions that follow in the SOD process. System framing is comprised of three major subcomponents, rival, command and logistics (Sorrells and others, 2005:23, 24). The reader should note that there is significant intermingling of these steps and the process should be viewed as iterative, nonlinear and fluid. The steps are, however, listed in general order of accomplishment in that each preceding step provides part of the picture for the current step (Sorrells and others, 2005: 22).

Rival as Rationale

This part of system framing uses three efforts to help determine the form of the enemy. Specifically, first examining the reasons for the enemy's behaviors, second, examine differences between the enemy and friendly systems and the logical relationships that exist for actions. Finally, the rival system is broken out by elements that fit within the system framing effort (Sorrels and others, 2005:24, 25).

Command as Rationale

This part of SOD is an examination of the existing command relationships in the context of the system frame. If current relationships are found lacking then new ones must be developed to meet the requirements of the design (Sorrels and others, 2005:25).

Logistics as Rationale

This examination's goal is to ensure that the logistics system is able to meet the demands of the design. If it does not then a redesign of either the operational design or the logistics system, whichever is most feasible, is in order (Sorrels and others, 2005:26).

Operational Framing

Operational framing is accomplished to shape the system in favor of the designer. This step, "describes the form of operational maneuver within the context of the rival, command, and logistics frames and within the boundaries of the system frame" (Umstead 2006:51). It does so within the boundaries of the system frame and it sets the boundaries for the operation (action or actions) to be taken (Sorrels and others, 2005:26).

Operational Effects

Operational effects is the definition of the ending conditions, not of the entire operation but at the point where the knowledge gained and the lessons learned during the operation are applied in the next iteration of the SOD process. Each effect should be defined in terms of the part of the enemy system acted upon, the resources and phasing necessary to achieve the effect and what learning will be achieved by that effect (Sorrells and others, 2005: 27).

Forms of Function

This part of SOD finally includes the operational planners, gives form to the effects to be achieved, and allows for the development of tasking. It takes the previous efforts and converts them into a plan with the intended result of disrupting the enemy system (Sorrells and others, 2005: 28).

Strategic Raid

This term does not necessarily use what would be considered a normal definition of raid, in that it implies applying energy into the enemy system through some means, i.e. the results of the forms of function, with the intent to analyze the results and then apply the knowledge gained in further application of the SOD process (Sorrells and others, 2005: 21). This leads to the iterative nature of SOD as each raid leads to a reevaluation of the system, a revised or new design and another strategic raid.

Other Relevant Terms

Systems Theory

...trans-disciplinary study of the abstract organization of phenomena, independent of their substance, type or spatial or temporal scale of existence. It investigates both the principles common to all complex entities, and the (usually mathematical) models that can be used to describe them. (Sorrells and others, 2005:53)

Operational Art

The employment of military forces to achieve strategic and/or operational objectives through the design, organization, integration, and conduct of strategies, campaigns, major operations, and battles. Operation art translates the joint force commander's strategy into operational design, and, ultimately, tactical action, by integrating key activities of all levels of war. (EBA Handbook 2006:GL-6,7)

Naveh states that operational art forces the commander to ask three questions:

(1) What military conditions must be produced in a theatre of war or operations to achieve the strategic goal? (2) What sequence of actions is most likely to produce that condition? (3) How should the resources of the force be applied to accomplish that sequence of actions? (Naveh 1997:307)

This chapter has developed the history behind EBO and SOD, the theoretical underpinnings of both methodologies, and the relevant terms defined and discussed where appropriate. It is necessary to understand the theory behind each; for a valid comparison as each planning methodology is steeped in its own terminology. The stage is now set for the following chapter's comparison and contrast of EBO and SOD.

III. Methodology

Overview

Effects-Based Operations (EBO) and Systemic Operational Design (SOD) are methods of conducting war at the operational level. The operational level of warfare bridges the gap between tactical level and the strategic level. As such, it ties the tactical capabilities of warfighters and equipment to the aims and goals of the leadership of the country. It is the purview of the senior theater commanders, i.e. generally two to four star generals. In this level of warfare, they take the guidance they have received from the political leaders and devise a concept of operations utilizing the force levels and structure they have been given by those same political leaders. Military doctrine begins at this level; political elections and discourse define strategic guidance and are therefore, at least in the American system, not determined by the military. Currently United States Joint doctrine espouses EBO and numerous official publications, such as Joint Doctrine Publication 1, Commanders handbook, and others detail current thinking on EBO.

SOD on the other hand is a relative newcomer to the doctrinal scene and as such there is a paucity of information available, so for the purposes of this paper a draft version of an unpublished monograph written by Major Robert Umstead and a similar 2005 monograph written by LTC William Sorrells, Lt Col Glen Downing, Maj Pal Blakesley, Maj Fason Walk, and Maj Richard Wallwork will serve as the backbone illustrative ideal for SOD. For EBO the, “*Commander’s Handbook for an Effects-Based Approach to Joint Operations*” provides the necessary illustrations for an in-depth comparison of EBO and SOD. The starting position for each is after the receipt of

guidance from the nation's political leaders. It will flow through course of action development and into implementation as depicted in Figure 5. SOD follows a similar flow, strategic direction is received, the commander and his staff then begin the SOD process described later in this chapter.

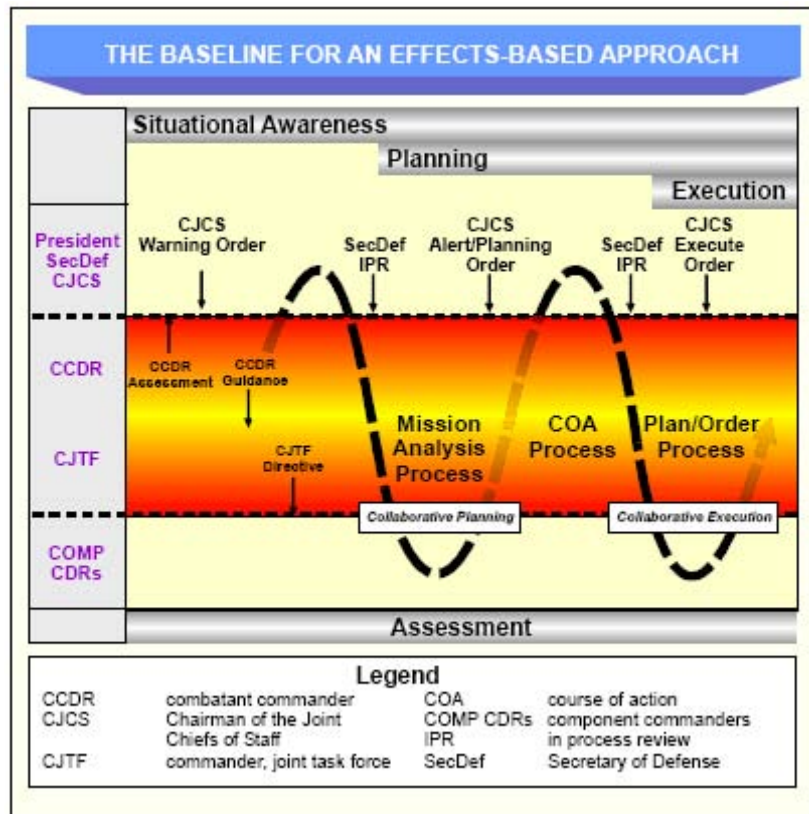


Figure 5: Baseline for an Effects-Based Approach (EBA Handbook 2006:I-4)

Similarities

So how are Effects-Based Operations and Systemic Operational Design alike? Let us begin with the chart in Figure 5. Intelligence Preparation of the Battlefield (JIPB) and System of System Analysis (SoSA) generally covers the situational awareness and planning portions for EBO while system framing, rival as rationale, command as rationale, and logistics as rationale cover the situational awareness aspects for SOD. The planning

portion is most closely aligned with operational framing, operational effects and forms of function.

First under an EBO construct, the commander develops his situational awareness of the Operational Environment (OE). This should be accomplished using a systems perspective. The commander attempts to learn all that is possible to know about the OE given the time constraints for a decision and action. The JIPB process generally develops the enemy's military system and that in turn is fed into the overall SoSA view of the enemy, friendly forces, and unaligned forces. (EBA Handbook 2006:II-1,2)

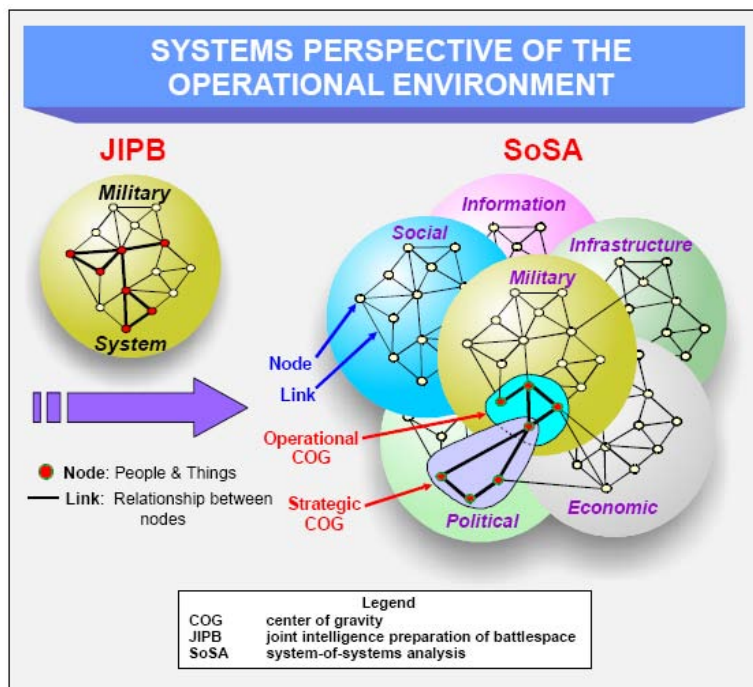


Figure 6: System Perspective (EBA Handbook 2006:II-2)

The commander and planning staff then focus upon those nodes and links that are deemed important to achieve the desired strategic effects. This focus results in a drill down into portions of the SoSA and produces key nodes. The idea being that key nodes

exert influence in numerous other systems, have many and/or extremely intense links to other nodes. (EBA Handbook 2006:II-3,4)

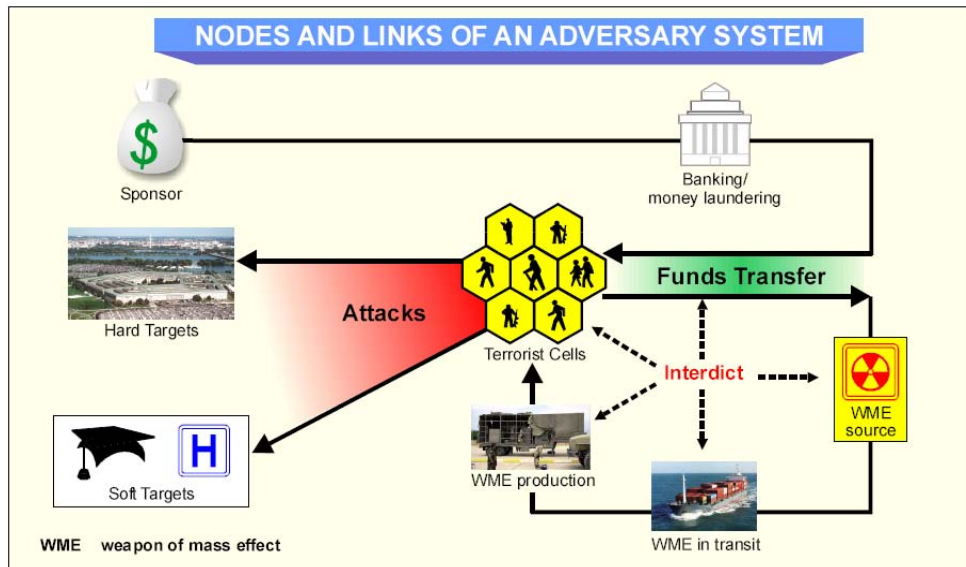


Figure 7: Nodes and Links of an Adversary System (EBA Handbook 2006:II-6).

These key nodes are then rolled into a center of gravity analysis and those evaluated as vulnerable to friendly effects are identified for incorporation into an effects analysis. This effects analysis uses methods, such as an input-output modeling to determine the likelihood of achieving positive (advantageous to friendly forces) and negative (detrimental to friendly forces) effects (Gallagher and others, 2005:5,11). This then provides the basis for Course of Action (COA) development. Once a COA has been selected, the planning staffs begin formulation of the operational orders that drive the planning and actions of tactical forces. So how then does Systemic Operational Design set about the same problem?

Systemic Operational Design also specifies a systems view, SOD freely admits that is impossible to understand any system and therefore seeks to frame the problem into one of manageable scope. Some of the questions asked and answered in system framing include, “What has changed that requires our action?” and “How does the strategic direction relate specifically to the situation at hand?” This system frame forms the background and scope of all further SOD methodologies including rival as rational. (Sorrells and others, 2005:23,24)

Rival as rational specifically addresses the enemy as a system. The purpose here is to determine the motivations, logic and behavioral reasons the enemy has for taking this particular form, in other words, “Why is the enemy behaving in this manner?” The rival as rational process helps define the interface between enemy and friendly command and logistical system (Sorrells and others, 2005:24,25).

Command as rational determines if the existing command structure is adequate to the envisioned operation, and if not what can be changed to make it so. The enemy’s capabilities to affect the friendly system, constraints the strategic guidance has levied on the commander, and the capacity of the friendly system to handle the operation must all be examined and resolved. This leads to logistics as rational (Sorrells and others, 2005:25).

Similar to command as rational, logistics as rational examines the existing logistical structure to determine its fitness for the envisioned operation. If the logistics system is found lacking then it must be redesigned such that all maneuver capabilities within the friendly forces can be supported. This maximizes the commander’s flexibility

and ensures a sound operational design. The process now enters the operational framing portion of SOD (Sorrells and others, 2005:26).

Operational framing is driven by the efforts of rival, command, and logistics as rational. This step seeks to develop an operational concept that takes advantage of the differences between the systems and produces conditions within the system in favor of the designer. Operational framing defines the set space of the operation and leads to the final two steps of the SOD process (Sorrells and others, 2005:26).

The purpose of the operational effects effort enables the end conditions, sets staging and phasing, and develops the learning plan for the operation. This is accomplished by tying each effect with an interface. The logical interface determines what portions of the enemy's system is acted upon. The time-space interface sets the staging and phasing for the operation. Finally, the learning interface sets the hooks in the design that facilitate learning. This is the final stage of SOD, that does not include the planners, and it leads to forms of function (Sorrells and others, 2005).

The final process in SOD, forms of function, fills in the missing pieces of the design. Actions are aligned with effects and resources. Planners dialogue with the designers and begin formulation of tasks (Sorrells and others, 2005:28).

In order to further the discussion on the similarities between EBO and SOD, a presentation given by Dr. Tim Challans from the School of Advanced Military Studies to the International Military Ethics Symposium (IMES), formerly known as the Joint Services Conference on Professional Ethics (JSCOPE) is used as a foil to prove, at least at the theoretical level that EBO and SOD are not substantially different. In this presentation Challans makes the argument that, "EBA lacks any moral quality because it

fails in every sense at the level of theory” (Challans 2006). This presentation is important for the discussion of operation doctrine; as it is one of the first writings that advocate the adoption of SOD in place of EBO. He cites the following “philosophical mistakes—metaphysical, epistemological, and logical” (Challans 2006). Each of these criticisms is examined in the following paragraphs.

The metaphysical error, according to Challans, is the correlation of effects and cause. He feels that EBO advocates presume to be able to cause a human to act in a specified manner. He points to action theory and its explanation for human action: reasons. These reasons are made up of beliefs and desires that form a person’s intention and he differentiates these reasons from causation. He states that it is impossible to cause human action because it is not governable by laws, i.e., when confronted with situation X humans always choose option C (Challans 2006). But is this a fair critique of EBO?

Supplement One to Commanders Handbook for an Effects-Based Approach details the theory and reasoning for the current understanding and methodology as it exists in the *Commanders Handbook for an Effects-Based Approach*. The following quotes shed interesting light on the thinking behind causation:

...no wise commander believes that most systems can be understood with anything resembling certainty or that systems can be manipulated with anything approximating deterministic mastery or precision...most systems of military interest ultimately are not amenable to analytical or engineered solutions...an effects based approach calls for a significant level of humility in expectations of certainty, precision, and control. (EB Handbook Sup 1 2006:5)

All of the above statements highlight the impossibility of totally conforming any system, let alone a human one, to the will of a military force. While not specifically addressing causation or action, it is readily apparent, from these statements, that no commander

should think that complete control of the enemy system is possible. Challans second critique of EBO is related to his first, and that is a problem of an epistemological nature.

Stated simply the problem is thus, “how can we know this chain of causes and effects” (Challans 2006). This, he states, is a problem with the nature of knowledge, i.e., he charges EBO advocates with falsely believing that the EBO process results in a certainty of knowledge. In defense of this position, he cites *Pamphlet 4* from the Joint Warfighting Center (Challans 2006). A quick look at the publication dates of the *Commanders Handbook for an Effects-Based Approach* reveals a 26 February 2006 publication date and its theory supplement follows approximately one month later. Dr Challans did not have access to these publications until several months after his presentation, however, there is one sentence that refutes this argument, “Most systems will confound detailed understanding; their nodes and links often cannot be accurately mapped; much of their inner dynamics will remain opaque to comprehension” (EB Handbook Sup 1 2006:5). This clearly highlights the imprecise and uncertain nature of any endeavor to map out a system of any type. Challans third critique is linked to the previous two and is one of logic (Challans 2006).

This failure of logic relates to “final causes” and “efficient clauses” (Challans 2006). Challans states that, “The effects-based approach presumes that final causes are operative; the system takes for granted a teleological view of science” (Challans 2006). Challans holds that EBO espouses that the effects desired by the commander “actually influence and have purported causal efficacy to events that occur temporarily prior to the desired effects. In other words, the future is helping to cause the past (or the present)” (Challans 2006). Again the reader is directed to *Supplement One to Commander’s*

Handbook for an Effects-Based Approach which states, "System end states will rarely be determinable in advance of operations, even though the desired end states need to be articulated for assessment, planning, and execution" (EB Handbook Sup 1 2006:5).

Finally, it concludes:

This concept argues rather for a framework that sees operations as learning—that is, military actions themselves become an experiential means of learning about the target system. Rather than being an engineered solution, an effects-based operation evolves as the joint force adapts responsively to the target system as it adapts to it. (EB Handbook Sup 1 2006:5)

Clearly, the similarities between Systemic Operational Design and Effects-Based Operations as discussed in this section lead one to conclude that indeed EBO and SOD are remarkably similar. While the techniques used differ, the result is largely the same. In EBO, the SoSA seeks to achieve the same results as system framing and operational framing in the SOD methodology; that is a clearer understanding of the OE and the enemy as a system.

Differences

Most of the friction between Effects-Based Operations advocates and those supporting Systemic Operational Design centers around one word: control. Lt Gen Deptula in a foreword for the Spring 2006, *Air & Space Power Journal*, writes the following about EBO, "At its heart is the exploration of control—creating the necessary effects so that an adversary operates in accordance with our national security objectives" (Deptula 2006: Foreword). Dr Challans dilemma seems to stem from his revulsion morally to the concept that humans are capable of being controlled. The comparison

process, by exposing the theory of EBO and SOD has rendered the argument about control invalid.

IV. Conclusions and Recommendations

Overview

The previous chapter detailed how similar Effects-Based Operations and Systemic Operational Design are once the hype and mythology are stripped away and the actual theoretical underpinnings are exposed. This chapter details lessons learned from this research effort and make recommendations for action and further research.

Conclusions of Research

Effects-Based Operations and Systemic Operational Design are more alike than proponents of either are likely to admit. SOD serves as a great tool to teach commanders how to think about the OE that they find themselves in and as a tool to conduct Effects-Based Operations. This is the art part of the operational level of war. It provides another tool the operational commander to conduct EBO. The doctrinal discussions of EBO have largely centered on the science of the operational level of war, that is, the mechanisms and technology that allow the commander to conduct EBO. There are obvious parallels between system of system analysis espoused in EBO and the system framing process in SOD. EBO currently suffers from a lack of historical planning examples, i.e., how does one actually conduct a System of Systems Analysis. SOD's system framing through discourse provides an alternative methodology on how to conduct this SoSA, but suffers even more from a lack of illustrative examples. Part of this difficulty can be traced to the cultural differences between the U.S. system and an Israeli system. Israel faces a

situation in which its enemies are known and immediately next-door, for the most part. When an Israeli general changes jobs, he is faced with nearly the same set of operational problems as in his previous job. When an U.S. general changes job's, it may be halfway around the world with a completely different set of operational problems.

Opponents of EBO criticize it for a linear view of the operation although the Joint Forces Command literature describes it as spiral or iterative. That is the plan is developed, executed, and then the cleanup begins. SOD through its upfront iterative design provides for a more reasoned updating approach and may produce less mess as well as require less time spent to clean it up. SOD acknowledges that once an operation is started the systems change, therefore a forward look is required, i.e., discussion of the past systems in the, what if? mode are useless. The knowledge to be gained needs to be framed in the context of what knowledge has been added to the commander's view of the enemy system. Future efforts should then concentrate on how can the commander now design an operation to take advantage of that knowledge gained and learn even more about the enemy's' system form.

Significance of Research

This research has shown that there is very little difference between EBO and SOD and that SOD can be used as part of the EBO process. The two processes are not mutually exclusive; they should, and can coexist. SOD has much to offer the joint community in provided a training and employment methodology for conducting of Effects-Based Operations, especially in the use of discourse to promote understanding of the OE. SOD's system framing naturally incorporates the interface between friendly,

unaligned, and enemy systems. This interaction is discussed in EBO literature but a visualization of how to capture this is still to be determined.

Recommendations for Action

Adoption of SOD techniques within the EBO doctrinal framework will provide another way to train commanders to approach the problems they face. Discourse, does promote a holistic view of the OE and due to its iterative nature, provides the built-in flexibility for the commander to change directions quickly. This flexibility and waiting to analyze the results of the strategic raid may, however, could produce a slower pace of operations. The payoff hopefully is that there are fewer errors made and in the end, the costs in terms of manpower, equipment, treasury and time are greatly reduced. The United States Air Force has, by in large, driven the discussions of Effects-Based Operations, but finds itself with very little expertise on Systemic Operational Design. Therefore, Air Force doctrine development must include further exploration of Systemic Operational Design as an alternative methodology for conducting EBO.

Recommendations for Future Research

The actual implementation of a Systemic Operational Design approach during a Joint Force Exercise should be the next goal for SOD research. This however is impossible until a sufficient cadre of individuals is trained in the SOD methodology. Therefore, a crawl, walk, run approach is in order. This paper and the SOD monographs offer the beginning of the crawl portion. Future research should concentrate on systems theory, knowledge management and implementation, as well as how tools of operations research trained analysts can be brought to bear on EBO and SOD.

Summary

The research has shown that the methodology of Systemic Operational Design, being touted by some in the United States Army and Marine Corps, is really another methodology to conduct Effects-Based Operations. The true difficulty of Effects-Based Operations lies in implementation of systems theory. Many in the United States Military are stuck in the linear Strategy to Task wrote formulation of doctrine from the 1970s and 80s. As somebody once said, “it’s hard to teach old dogs new tricks”. Many have a difficult time understanding how to implement Effects-Based Operations and as a result, most of the criticism of EBO extends from that fact. Those that promote SOD as an alternative use this criticism of EBO as the source of their discontent. However, SOD will soon face this same criticism, probably more so, given the art nature of the planning methodology. Further doctrinal discussions that include SOD can only serve to strengthen EBO as the doctrinal element comprising the operational level of warfare.

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