

Are Diplomatic, Information, and Economic Resource Planning Consistent with Military Planning for Operations?

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ABSTRACT

The demands on time, the complexity of operations and the possible devastating outcome of operation that causes life, infrastructure and other values have forces the military to develop their structures. This are used in defence and in offensive operations. The civilian side on other hand have other structures when they are planning their operations. If military and civilian operations need to be planned to use Diplomatic-, Information-, Military-, and Economic-based (DIME) resources then they need to work together. Then there is a need to find a strategy for synchronising these different structures to leverage into effects that can generate desired end states. Historically Sweden has since WWII been forced to develop a defence strategy that uses DIME planning and execution. This is visible when we look into the building of Swedish infrastructure such as roads, bridges, hospitals, suburbs, villa communities and so on. Here is a practical experience on co-operation between M and DIE-alike that shows how to best to utilise DIME-based cooperation.

The turnaround times for DIE compared with M in operations are different. If we believe that the turnaround time for military-based operations is faster than diplomatic-, information-, or economic-related turnaround times then this needs to be considered in planning. If we believe that DIE based-operations need to be present during military operations, but they work through different mechanisms, there is a need for better understanding of the overall mechanisms. One approach to find and use such mechanisms involves modelling and simulation as well as concepts from control theory. These mechanisms can then be invoked in a command and control system to use overall DIME resource repertoires for synchronising operations and other activities.

The Swedish National Defence College (SNDC) strives to develop methods and techniques to support these types of operations. Command and control systems are built and used by humans in operations. Design for the co-operating groups and machines need to be well designed. This is an extremely complex task to accomplish. This paper aims to present an on going research and development effort that has focused on the solution of such problem since 1996, it will also provide results from this ongoing research and development effort.

INTRODUCTION

This paper discusses some of the mechanisms that are essential to know for joint planning that uses different types of resources. It does not consider who should be in charge of a campaign. Nor does it consider when to shift between a military lead and a civilian lead in the operation as a result of the operation progression.

Planning procedures for the Diplomatic core in one country are different from diplomatic planning procedures in other countries. We can assume that each country will have different planning procedures. European Unions and United Nations planned procedures will probably provide additional planning procedures. All planning procedures need to define the mechanisms direct and indirect interaction.

The mechanisms we need to study involve the interaction between two systems. First system is the resources with which we plan. In military planning such interactions may be more visible since the resources are combat units or combat forces. But to plan and represent the diplomat resource or the information campaign and the economic resource are more difficult. The other system that we need to study is the system that is to be controlled. The interacting mechanisms between the controlling system and the controlled system where the controlled system is in a particular country of interest are of particular concern. By finding the interacting mechanisms we hope to use our resource capabilities in the country and results from studies to reach a desired End-State.

We study the mechanisms participating in interactions from a specific perspective. This research perspective can be formulated as "Is there a method, that supports and preserves dynamics in the contextual dependencies in such a way that expressed objectives can be transferred from one military group to another under the constraints that the organization as a whole meets stated effects with their execution?" In order to resolve this question we need to define the interacting mechanisms and represent information so it can be interpreted by humans and parsed by machines.

Until now the interacting mechanisms have been developed to capture environmental and social mechanisms as well as the behaviour of military resources. This approach has been used in two different exercises, one studied Afghanistan in 2003, the other studied Iraq in 2004. With the new Effect-Based operational procedures comes the need to develop the appropriate interaction mechanisms linked to other resources in order to control those resources as well as the mechanisms involved in activities in the controlled country. This paper tries to discuss these new interaction mechanisms. The paper discusses the defining parties, the representation of essentials, and symbolic representation in a context.

DEFINING PARTIES

For simplicity reasons we name the different parties by colour. Green has the problem of regaining control of activities in its own country. In that country there are different colours of adversaries, different colours of Red. Unknown participating adversaries are named Yellow. Intervening parties are grouped under the colour of Blue. We therefore assume that the intervening part, Blue, is asked by Green to help Green diminish Red influence so effectively that Green can regain self-control and Blue can withdraw after Red and Yellow have been eliminated. Green can execute the self-control under agreed human rights.

THE REPRESENTATION OF ESSENTIALS

Our research derives from semiotics (the science of signs) and incorporates linguistics and system sciences. It tries to systematically condense sociology, public policy, military theory into a computer based system. As with all representation and modelling it involves making assumptions, linearization, our choice of what is to be modelled and what is not considered. In this all our models are wrong if we state that the model predicts coming future events. They are not even validated against precise data, much because this data are difficult to collect and some data do not even exist. Interviews with subject matter experts have resulted in the collection of data and explanations and their use to construct models. During two different exercises such models have displayed outcomes to different groups of subject matter experts and have been found reasonably accurate considering the nature of the model inputs. One may say that for this group the models represent a reasonable representation of the interaction between military planning and the response of countries of interest. This is for now a sufficient judgement for our research question, which is about notational systems.

We are influenced by Pierce's definition of semiotics (see: Nöth, 1995). The essentials for the importance of a sign are: firstly the visual appearances, secondly the definitions put into natural text format, and thirdly the human subject's own implicit interpretation of the sign. A later development of what is considered significant involves use of the concept of dynamic semiotics (see: Andersen) that also considers the relevance and importance of dynamics in it self which can be considered different to a human's own implicit interpretation. This implies the use of a military symbology library, Mil-Std 2525B, the appropriate text definitions for resources, and their imperatives.

To define dynamics we apply system thinking tools (Richmond, 2004) and systems theory in order to extract essentials of people's implicit interpretation of military resources

and their imperatives. This can then be formulated into explicit dynamic models. To extract, condense, and formulate the implicit individual interpretations into a sufficiently explicit formal description that can be simulated in a computer is a very tiring and cumbersome process. This construction procedure is used to construct the game area, in which we later allow parties to play, this construction can be called The Substrate. (see: Dockery and Woodcock, 1993)

By adopting well-established military and industrial planning procedures into several computer-based tools we leverage the activities of extensive amounts of military staff work. The planning products are stored, and then simulated. The hypothesis is that by seeing the plan executed in a synthetic simulation a syndicate is better able to understand the specific nature of a developed plan. The Swedish National Defence College is in the process of refining the experimentation conditions in order to measure, trace, and verify that developed procedures and tools are actually enhancing the overall planning activity.

SYMBOLIC REPRESENTATION IN A CONTEXT

Military symbols to represent the situation are often placed on a map. By showing all military units, as in Figure 1, the displayed picture tends to be cluttered and can be difficult for an individual to assess the situation in a short time. If you know what to look for then it generally becomes easier to find specific entities in the overall map.

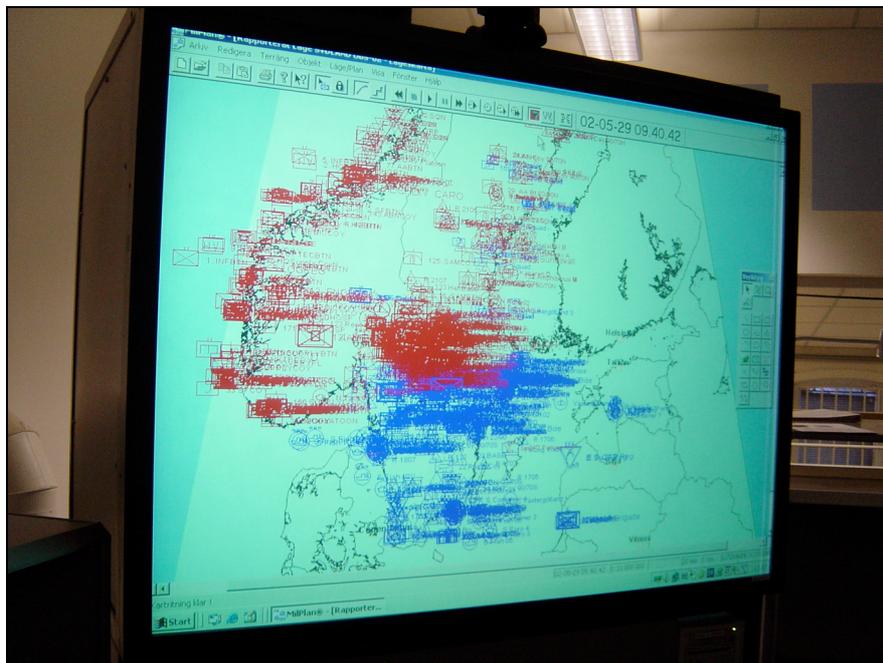


Figure 1: Resulting picture of expressed tactics.

Mil-Std 2525B defines two symbol graphics classes. Tactical symbols describe point-based units and their tasks. Tactical graphics are symbolised by line or area spread based representations and more signifying contextual information. By using Mil-Std 2525B a military individual can represent temporal based scenes although this lacks the direct and indirect interactions and the indication that military activities can involve other resources

other than military resources. In order to address such difficulties we introduce and define a class of entities called Tactical Event Indicators (TEI). This third symbol class can involve point, line, area, and also volume-based symbols. The tactical event indicator class can involve two dimensional display devices as well as three-dimensional and stereoscopic display devices. A two-dimensional back projection display is shown in Figure 1. In our construction of the tactical event indicators (TEI) contains both the measures of effectiveness (MoE) and the measures of performance (MoP) representations. The MoE contains the indication and status of the system that we are to control. The MoP indicates and signifies the status of the controlling mechanisms. The military component involves military units and forces. Since the controlling mechanisms is the military force, its performances can be signified by the MoP which indicate the locations of the forces, their combat status strength values, etc. The MoP, or parts of it, are displayed in Figure 1 in order to provide an example of how cluttered a situation picture can become.

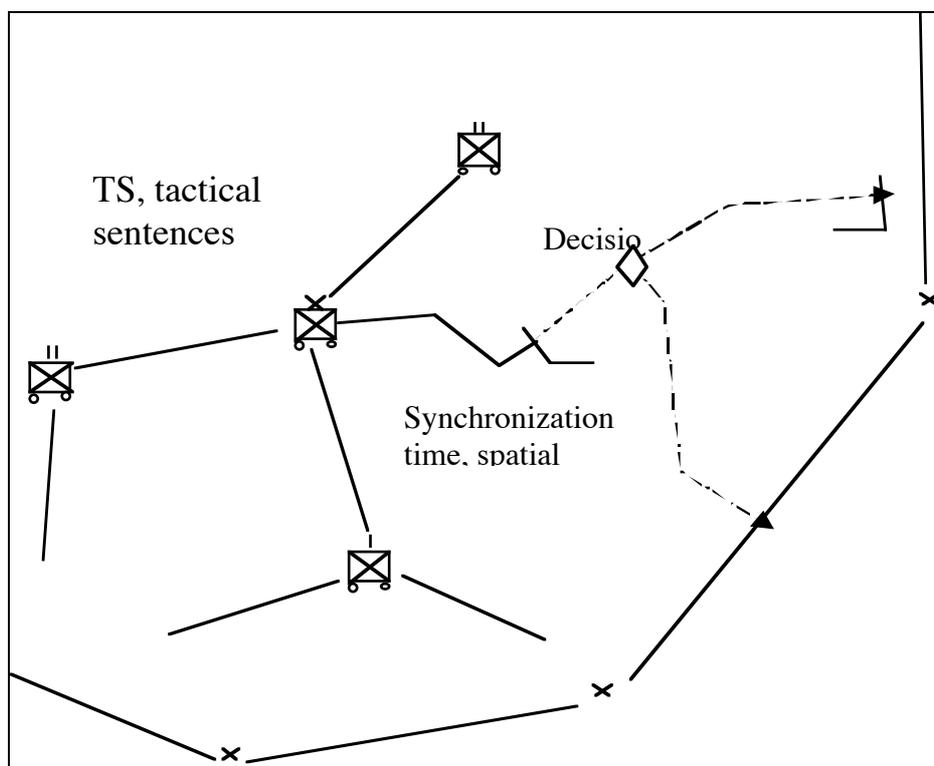


Figure 2: Tactical symbols can be used to build tactical sentences.

Because of the amount of unit symbols it is difficult to quickly parse and infer the situation just by a glance of the situation display. Still the tactical symbols represent units where they are and to this where they are aimed to be in future time. With the tactical symbols military officers think in tactics and they produce orders or actions to conduct. By linking the visual symbols to its text definition and a model of dynamic behavioural the force have an officer gain multiple ways to define the tactical sentence. By dragging and dropping this sentence on to the map of the country he is then able to simulate and check the tactical sentence effects on the MoE. The tactical symbols are not yet full implemented in the software although main parts have been implemented. Figure 2 presents a tactical sentence expressed in a graphical way. In the software an officer can choose between different combat units and its links to a command hierarchy. To this a military officer can assign different orders. In the Figure 2, a brigade has been assigned the order, 'goto.' By doing this he will

effect the simulation. Not shown in Figure 2 are the tactical graphics. Tactical graphics are linked to the underlying game area.

DIRECT AND INDIRECT INTERACTIONS

Figure 3 illustrates direct and indirect interactions. Bars represent the time (increasing time downwards) that each model in reality is interacting in our simulation with other models. Bars of blue force acting, red force acting, neutral force acting, and social economical, infrastructural acting. The thin arrowed arcs between the bars in the Figure 3 represent the acting. With direct interaction we define as data exchange between two models in the simulation. By indirect interaction we mean data exchange via some intermediate model in the simulation. Between the Blue and Red models there is an arc representing data exchange between Blue model of a force and the Red model of a force. In attrition modelling such as the Lanchester equations this means that Blue force attrition is directly proportional to Red Force strength. This in turn means that a Lanchester model does represent environmental interactions, just the force-on-force aspects of combat no matter where the battle may take place. This may be satisfactory under appropriate types of combat condition involving active fire-fighting. This is not the case if we model a peace support operation that involves force and peace influences of significant magnitudes. By invoking social and economical models we gain the indirect interactions that will give a higher level of reliability to calculated outcomes so that planners can observe invoked actions and study the effect of such actions.

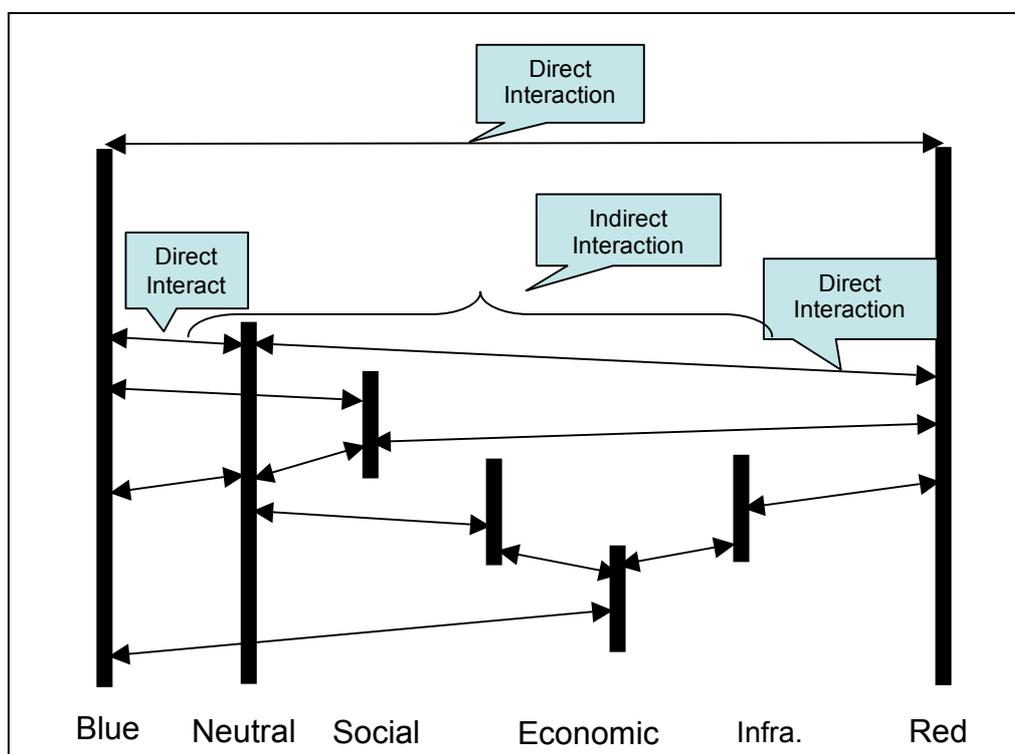


Figure 3: Direct and indirect interactions.

By developing the tactical event (TEI) class indicators we believe this will enhance the perception of crisis dynamics. The introduction of our choice of measure of effectiveness

indicators as a part in the tactical event indicators will enhance perception. The tactical event indicators have been primarily designed to represent the impact of a planned activity on the controlled system and not the nature of the controlling mechanisms. This means that we have developed more indicators that the military activities are causing on the society than the indicators are showing on the military controlling system. The development of tactical event indicators has focus on representing the measures of effectiveness and not so much on the measures of performance. Although measures of performance caused by indirect interactions is of increasing interest. We present our MoE indicators below and its relation to effect based operations.

THE EFFECT-BASED OPERATIONS (EBO) FACT MODEL

United States Joint Forces Command defines Effect-Based Operations (EBO) in EBO CONOPS Version 0.61 as

“Operations that are planned, executed, assessed, and adapted based on a holistic understanding of the operational environment in order to influence or change system behaviour or capabilities using the integrated application of selected instruments of power to achieve directed policy aims.”

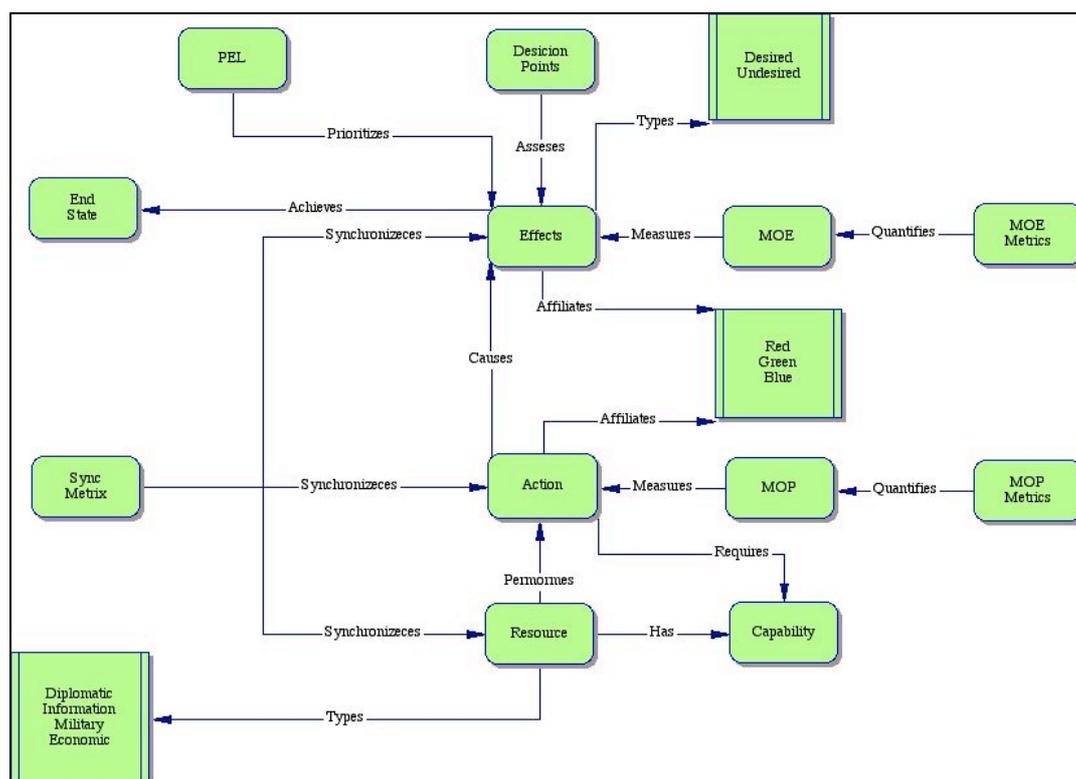


Figure 4: A redrawn version of an EBO Fact model.

The NATO EBO fact model version 1.0 has been redrawn in Figure 4. We can traverse and “read the model” as resources of different kinds (bottom left) emanate from different categories. These categories are diplomatic (D), information (I) campaign (or, if driven by the military its called information operations) either way its about conducting information that

gets to the target audience and make them either hostile or liking towards different phenomena hosted in their own country, or from the intervening countries. Economical (E) operations are targeting specific mechanisms in the country of interest. All from sanctions, donations, bribery, to buying goods to help trading. Military resources are clearer what that means compared to what D-I-E resources means or mechanisms are. Resources take actions that will lead to effects. Those have indications on or are tied to measures of effectiveness.

ENDSTATE INDICATORS

End state indicators can be defined as indicators with a desired threshold. Indicators per se are defined by different organisations and for their purposes (Christensson and Woodcock, 2005). Political sciences use their indicators, public policies, and economists as macro or micro economist uses theirs. There are indicators for indicating failing states. The fact that indicators do influence political debates can be considered, as there is a portion of usability in the existence of defined indicators. Depending on what discipline is observing, the different beliefs sorts the indicators according to different philosophies. From a psychologist's point of view one can sort the indicators according to Maslow hierarchy of needs. In this analogy it is assumed that the individual is the country and the Maslow hierarchy is translated from an individual humans perspective to the countries perspective. In this paper we do not argue if such a translation can be done or not, all we can say it needs a lot of imagination. Maslow theory applied on a country that is in a phase IV operation, see the left part of Figure 5, may result in the following order.

Self Actualization	Self Rules		
	Government Improvements		
	Country Growth		
Esteem	Achievements	→ Reconstruction	
	Status	→ International Trade	
	Responsibilities	→ Self Sufficiency	Growth
Belonging	Reputation	→ Rule of Law	Indicators
	Family	→ Civil-Administrations	-----
	Community	→ Law Enforcements	Deficiency
	Country	→ Juridical System	Indicators
Basic Life Needs		→ Communications	
	Food	→ Security Operations	
	Water	→ Human Rights	
	Shelter	→ Food Distribution	
	Security	→ Medical	
		→ Basic Utilities	

The Maslow hierarchy involves assumptions and constraints. These assumptions and constraints are not compliant to use for a comparison between a country and a country; although it may serve as an analogy for mental comparisons to sort the indicators into groups and naming these groups.

An other and different way to Maslow sorting theory to cluster our indicators, is a DIME guided sorting theory, the right part of Figure 5. This can serve as a support to group the

indicators into other hierarchies. The hierarchy can be identified if we look at and compare the resource categories aimed to be used in Effect-Based Planning. We suggest a sorting paradigm that focuses on, from bottom up, the physical, psychological, societal, governing and political domains. Giving a clear group for military measures of effectiveness assessment while others are planning activities that will showed in the other five groups. This of course assumes that the physical or environment indicators can be substantially related to the End-State levels will the others are doing their actions and producing desired effects.

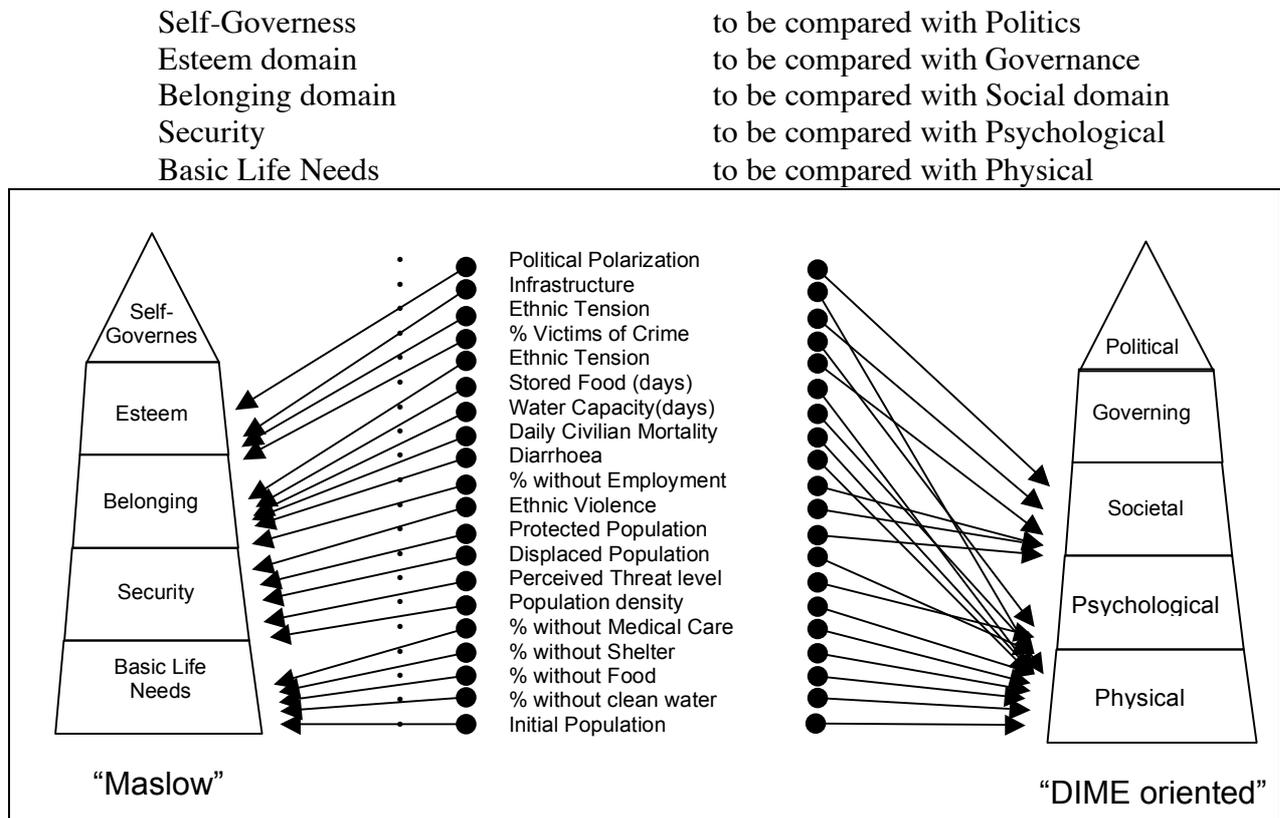


Figure 5: Comparing Maslow’s and the DIME paradigm sorting methods

THE DIME PARADIGM

If an intervention is foreseen as the ultimate end solution to resolve crises that is in growth in a specific country, call it CrisesLand, and the international community that are taking the interveners right to take action against CrisesLand has to plan this intervention. Planning because this types of operations needs to be executed by thousands of people. If the intervening community is to execute command and control in order to obtain stated and agreed goals for the intervention, planning activities need to formulate what is the anticipated effect based End state (EES). The tasks that all resources are to accomplish, and how those activities are to be controlled, should also be specified. Defined and formulated EES need to be described in such a way that it is operational sound to command resources and control their execution against stated end state. A state that resolves the initial crises that was foreseen. The Effect-based End State needs to described in at least five different domains and these domain variables end state should be specified.

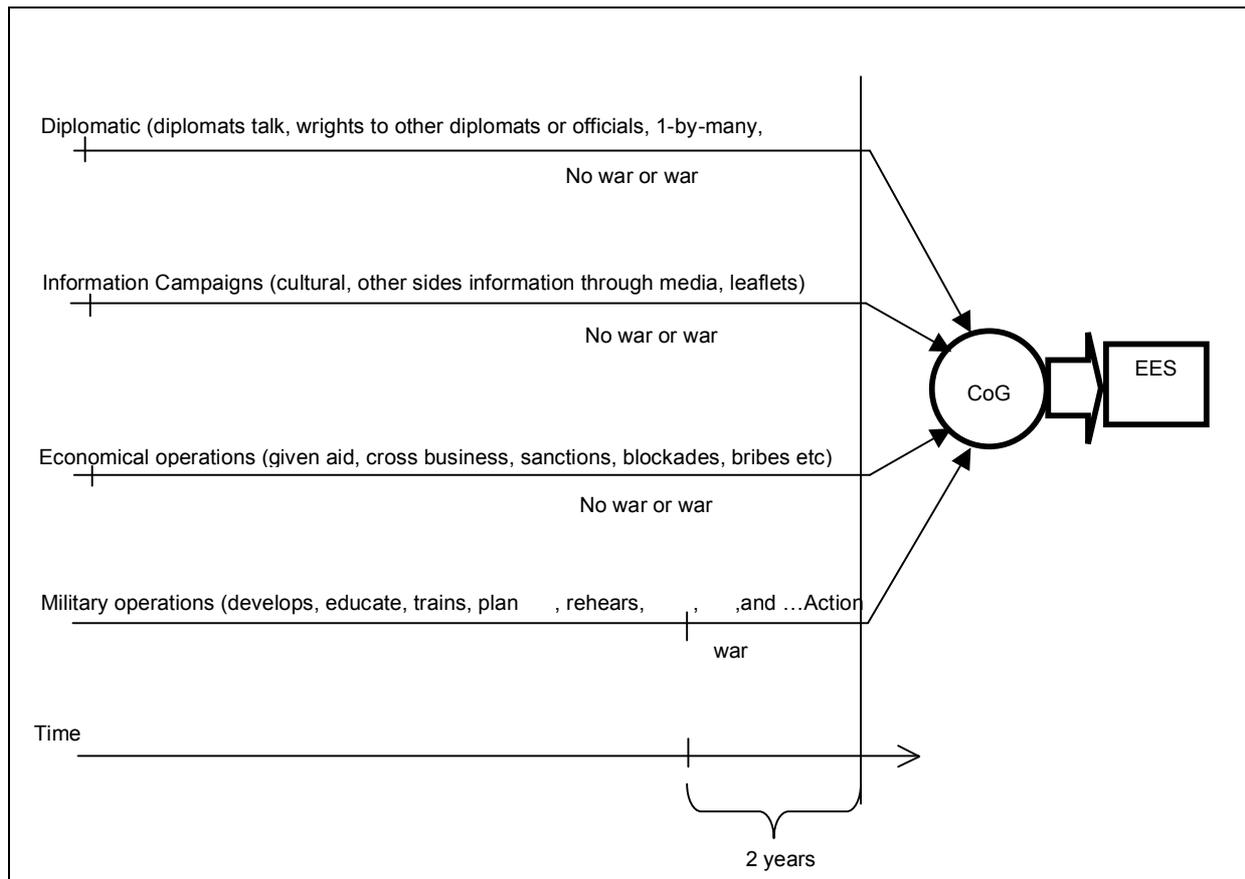


Figure 6: A resource-centric operational score.

Comparing the different resource stated in the acronym DIME from a modelling perspective we may get a better understanding. This activity is by no means a complete comparison. It will just serve as a rough sorting mechanism and a more detailed in depth modelling process is necessary if one are to build a spatial-time dependant simulation. The resource the Diplomat is often a single person or a small team that is sent out from one country to be assigned in a specific country. In the receiving country they have their defined protocol to acknowledge the arriving new diplomat. The arriving diplomat is the foreign country governmental representative in the designated country. Arriving diplomats should know a lot about their country of assignment, the language, important people, religious grouping, ethnic distribution of relevance. Components of them, or operational types and their mechanisms, may help to sort out what we are dealing with if we are to use and plane with this resources in campaigns.

- Part, The sending government diplomat as a government spokesman in the receiving country. The carrier and sender of information is a diplomat and he uses the diplomat chain in the receiving countries. The Diplomat has to follow the diplomatic protocol. A protocol developed over hundreds of years and is a book of best of practice collected over a long time.
- Means, The diplomats warhead is packed in text and/or is orally distributed. From one-to-one or one-to-many. The text or orally sentence is in it self not the lethal part. It is when parsed by receiver, text or oral utterance can have its effect.

Resource	Part	Means	Interaction	Pace	Effect	Mechanisms
Diplomat	Official Diplomats	Talks, Text	Indirect cognitive	Slow→Fast	No war, war	Nod-Arc-Nod, turntaking
Information Campaign	Large Groups, Ethnic, Religious	Media, Leflets, etc.	Indirect, social	Slow	No war, war	Nod-Spatial
Economical Actions	Government to government or NGO, IO	Given aid, cross business, sanctions, blockades, bribes	Indirect, Cognitive Social	Slow→Fast	No war, war	Nod-Arc-nod
Military Operations	Red, Green	Rehears, Defensive, offensive	Indirect, direct, Cognitive, Social, Physical	Fast	No war, war	Spatial-spatial, initiative based or turn-taking

Table 1: Some comparing of different modelling view on DIME

- Interactions; Our resources are interacting in different ways. One diplomat is interacting through the defined means but it depends on the recipient to have capabilities to receive a message. Received message in turn is carried or used as a part for a decision that may lead to a action directed to a on going conflict. In informational campaigns a sender opens up for many recipients to perceive the sent message and in turn this is discussed among the individuals in a social community or triad.
- Pace; with pace we mean the time it takes to decide, go to action, get feedback and infer the nature of a situation. A diplomat that is delivering information to the correct recipient contact that is an acknowledgement, for example in a negotiation and if the delivered information is agreed upon, then this action can may have a rapid impact and may even prevent a war from taking place. On the other hand if recipient part does not acknowledge because of other plans this can take time, with perhaps dangerous consequences. If information campaigns are to be conducted it is difficult to identify its pace. It is sent from one point and received by many. One example of this is the unfortunate publications of character drawings of Islamic prophet Mohammed. From publication to reaction it took several months before riots occurred. Although web-published drawings of the prophet Mohammed have been created earlier.
- Effects; here we define the effects in terms of War or No War. This is of course very brutal differentiation. In real life there are more subtleties.
- Mechanisms; Here we define the mechanisms in point to point or point to spatial or spatial to point or spatial to spatial. Depending on how the resources means are functioning.

These different components of the mechanisms need to be considered when we consider the EndState associated with different phases of activity.

THE ROLE OF DIME IN SCENARIO PLANS AND ANALYSIS OF ITS OUTCOME

Based on UN resolutions, mandates with mission text the commander need to issue a Initial Directives that in turn focus the commander planning Guidance to the scenario choice. In the Afghanistan scenario played a phase III or Peace Enforcement operation plan was developed. Mixed in this we anticipate non-combatant evacuations along with humanitarian disasters and assistance. An End-State has to be developed based on effect-based considerations. As one representative from the Pentagon put it Phase I operations are civilian responsibilities, phase II and III are US DoD responsibilities. Phase IV is again the responsibilities for the civilian side of the intervening force and related entities.

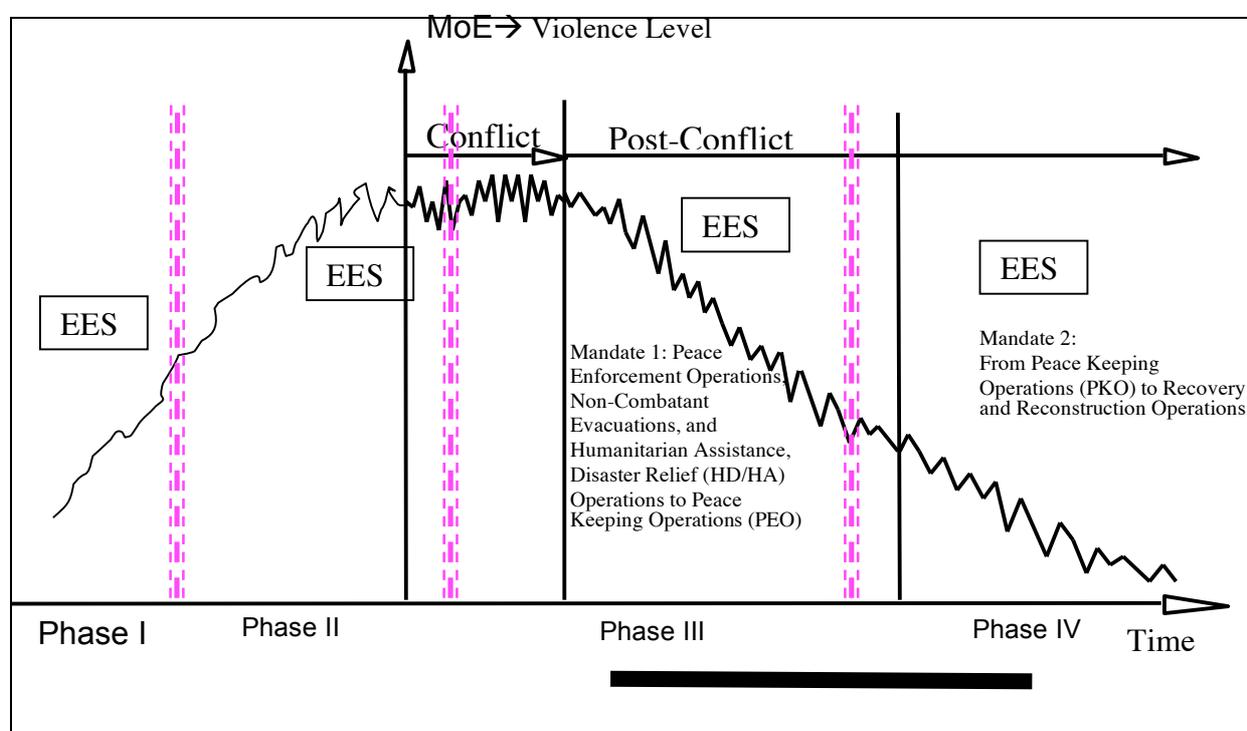


Figure 7: Effect-based End-States (EES) in different conflict phases.

During two different group-planning studies we have used NATO Guidelines for Operational Planning procedures. The computer-based tool, DMSCupol, is used for group modelling. A distributed staff can gradually mature its plan. Planning products are stored in the document management system (DMS) and a graphical orientations layout directs to staff to focus on essential processes. By the time a staff is beginning to think in terms of initial “where to deploy” and throughout the planning process up to initial deployment scene this data is sent to the STRATMAS[®] simulation system. STRATMAS[®] simulates and produces the effects the nature of which are then drawn as colour landscapes and graphs.

DMSCUPOL

DMSCupol is the tool to support a distributed staff to gradually produce a plan. Each staff member uses the document management system trimmed to fit the procedural steps in operational planning. This gives the staff member the ability to freely use the local tools and save produced files associated with the context of the plan. When the planning activities have defined units, areas of responsibilities, longitudes/latitudes, orders, etc this information can be sent to STRATMAS for simulation and impact analysis

STRATMAS®

The Strategic Management System, STRATMAS® is a client-server based simulation, optimization and turn-taking optimization system. It runs under Unix, MacOS X and PC-Windows. The present version is a complete reconstruction of all early versions. The JAVA thick client can work in active or passive mode. This client connects to multiple servers that can run different simulations of the war. The active client starts, stops and set the conditions, will the passive client can tap into a ongoing simulation and by this follow the simulation as it proceeds. STRATMAS® output is a dynamic coloured landscape where the user can choose to display one or many of the 24 STRATMAS® different indicators.

EXERCISE AFGHANISTAN

This exercise was undertaken during January 2003 and was a phase III operation in Afghanistan. Participating in this was military, diplomats, field experts and an International Red Cross team. Presented with a scenario and given a force their activities produced a plan that then was simulated. Participating staff members gave suggested in spontaneous opinions and the exercise was very well received. A more holistic plan, with deeper specific insights, could be achieved by using this type of tool support in a relatively short time

EXERCISE IRAQ FUTURE '05

This following up exercise used a phase III scenario for Iraq as if it would be played 2005 although it was played in April 2004 (Christensson 2005). Here 9 different planning groups where divided into five J5 planning groups and four J2 planning groups. The mixed knowledge of NATO planning procedure and knowledge of NATO symbols resulted in different plan qualities. The best plans where reformatted into the simulations system. This where then presented to the officers. They how have knowledge in NATO procedures liked the tools more then thus who had little experience of NATO procedures.

A BRIEF SUMMARY

To summarise, we can identify that tool support is good especially if its mechanisms are transparent. The military possesses an insight to the nature of their own mechanisms and on purely military effects. However, some uncertainty may exist in the nature of the indirect impact of those actions on the wider society. The nature and impact of Diplomatic, Information and Economic resource-based mechanisms are unclear to military planners. Difficulties to plan in co-ordinated ways with these diverse entities hinders the overall planning process. To perceive the dynamics in the response when the initial deployment scenes are executed helps but such activities need to be further investigated. It is also of importance to be clear on the nature of the role each of the parties are playing and their defined effect based end states.

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