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**Modeling the Creation of
Actionable Knowledge within
a Joint Task Force Command
System (*Project GNOSIS*)**

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EXECUTIVE SUMMARY

Project Gnosis was a two-year research and development effort undertaken by Evidence Based Research Incorporated to build a simulation model of the knowledge creation process within a future Joint Task Force (JTF) command system. A unique aspect of this model is its explicit representation of the hierarchical knowledge state created by the JTF planning rhythm. The foundation of this knowledge state is a set of strategic objectives issued by National Command Authorities. Through a succession of simulated knowledge creation tasks, these objectives are decomposed into several levels of actionable knowledge, including desired strategic endstates, centers of gravity, supporting functional elements, and—finally—a prioritized set of node mission packages to be executed by the subordinate component commands. This knowledge state can potentially include thousands of associated knowledge elements representing an operational scenario. These knowledge elements correspond to the information that would be contained in such products as the Commander's Guidance Statement, Prioritized Effects List, Joint Prioritized Target List, Effects Tasking Order, Daily Apportionment Order, and so forth.

The model also represents a social network of staff actors that collaboratively contribute their unique bodies of expertise to specific knowledge creation tasks. This aspect of the model enables the analyst to address knowledge creation as a socially influenced process wherein the quality of the resulting knowledge product depends upon the appropriate and effective integration of unique areas of expertise. Here, staff actor knowledge is stochastically represented in terms of probability matrices that specify the likelihood of an actor "recognizing" the linkages that exist among the thousands of knowledge elements. The model structures the participation of staff actors through their assignment to specifically defined boards, working groups, and cells within the JTF command process. Additionally, the ability of each actor to effectively contribute their unique knowledge within these various communities of interest is modulated by a number of cognitive, social, organizational, and technological factors that can be set by the analyst.

The present model includes a baseline database that addresses a four-phase operational scenario: setting initial conditions, initial forced entry, decisive action, and stability and reconstruction. These phases include a wide variety of political, military, economic, social, information, and infrastructure (PMESII) scenario elements that must be addressed by the JTF planning process. Model output can be used to assess overall JTF planning effectiveness (in terms of the percentage of "ideal world" actionable knowledge reflected in the resulting Effects Tasking Order), number of mission nominations that produce unintended negative consequences (due to inadequate vetting), and operational outcome (in terms of the percentage of operational campaign objectives successfully executed in each phase of the scenario). A host of diagnostic information is also provided by the model that can be used to assess patterns of staff actor involvement and other types of internal system performance. Specific guidance is provided regarding the study of a variety of information technology, leadership, training, and personnel management issues and their impact on the JTF command system effectiveness. Two sets of parametric model runs are included in this report that illustrate the model's ability to address the impact of staff actor knowledge and personnel instability on key staff positions. The model is written in Micro Saint Sharp and can be executed on a desktop computer with sufficient speed and memory. While the present model includes only a rudimentary representation of actual battlespace results, its structure lends itself to future integration in a larger confederation of combat simulation models.

The goal of Project Gnosis was the initial proof-of-principle development of a new generation of simulation models that would be capable of analytically addressing multiple facets of the sensemaking and knowledge management process that occurs within a military command and control system. To that end, the present model allows the analyst to examine the impact of various cognitive, social and—to a limited extent—ecological variables on the ability of a JTF command process to produce and execute an Effects Tasking Order. As with a real-world military command and control system operating in a modern PMESII problem space, the simulated planning and execution process reflects the complex interaction of thousands of constructs and processes. Although the underlying logic of the model architecture is relatively straightforward and transparent, our limited experience with this type of simulation model in the present project has revealed its use to be challenging. Various sets of cognitive and social variables and constructs embedded within the model can interact in sometimes surprising ways to either enhance or degrade knowledge creation performance. Yet this is merely a reflection of the same complexity faced by analysts in studying real-world phenomena. Accordingly, great care must be taken in both defining the types of systems engineering issues to be addressed and the manner in which these issues are reflected in the myriad of data input required for each model run.

In this regard, the report has suggested a number of “analytic avenues” along which the analyst can use the model to address certain types of systems engineering issues. Yet this guidance must be supplemented with the analyst’s experience in running the model—experience that reveals critical model sensitivities and limitations. Thus, caution must be raised against the notion that the model can be employed by the casual user to generate a quick or simple set of parametric analyses. Like with any complex simulation model, the use of this model requires a committed set of analysts who can dedicate the time and attention needed to become intimately familiar with the model’s workings.

The two series of parametric runs illustrated in the report are but a small sampling of the studies that could be undertaken with the model, depending upon the interests of the analyst. Like any complex simulation model, the present model is an analytic tool, not an answer to a specific systems engineering question. Consequently, the validity and quality of the insight achieved with the use of this model depends entirely upon the skill of the analyst to (1) develop valid input parameters from real-world observations and experience, (2) calibrate these input parameters with the analytic assumptions and algorithms embedded within the software, (3) form the input parameters into a cohesive “case representation” that is consistent with the model architecture, and (4) properly interpret the model output to reflect the type of insight appropriate for addressing a specific systems engineering issue.

Finally, it is acknowledged that the present model is by no means a complete representation of the process by which actionable knowledge is produced by an organization in the real world. Much research remains for the future to explore and refine other aspects of sensemaking and knowledge management. Project Gnosis is the beginning of but a very long journey to address the cognitive, social, and ecological dimensions of this process in a systematic and analytic manner. It has, however, demonstrated the feasibility and utility of such an undertaking. To that end, the present research study serves as both a milestone for the present and a direction sign for the future.

INTRODUCTION

This final technical report summarizes the work and findings of a two-year Phase-II Small Business Innovative Research (SBIR) project (*Project Gnosis*) that developed an explicit simulation of the sensemaking and knowledge creation process within a Joint Task Force (JTF) command system. The project was funded by the Human Effectiveness Directorate of the Air Force Research Laboratory at Wright-Patterson Air Force Base in response to the Air Force's need for a new generation of command and control (C²) models. Earlier conceptual designs of this model were published by Leedom & Eggleston (2005a) and Leedom & Eggleston (2005b). The resulting simulation model explicitly portrays the process by which a JTF headquarters translates higher-level command intent into a specific operational tasking order that is subsequently executed by the various air, ground, maritime, and Special Forces subordinate commands. The knowledge space represented within the model considers the various political, economic, military, social, information, and infrastructure (PMESII) dimensions of the battlespace over a four-phase operational scenario. Additionally, the model explicitly portrays the operational expertise, social status, and availability characteristics of relevant staff actors within the JTF command system. These staff actors comprise various network-enabled planning boards, working groups, and cells within the JTF command system. It then uses these representations to estimate the degree to which each actor participates in various steps of the collaborative planning process. The resulting quality of the operational tasking order that emerges from this process (measured against an "ideal world" plan) is significantly influenced by contributions each staff actor is allowed to make at specific steps in the planning process. Through this type of modeling representation, analysts can explore the impact of various cognitive, social, organizational, and technological factors on the overall effectiveness of the JTF command system. The simulation model, using the latest features available in the *MicroSaint*® modeling environment, can be run on a desktop PC with a Microsoft Windows® operating environment. Depending upon the number of scenario phases considered in a given execution of the model, run times vary between 30 seconds and a few minutes. The resulting model allows the analyst to explore various types of parametric changes to actor knowledge, social status, and availability, as well as different types of collaboration rules that affect staff actor contribution.

This final technical report provides an in-depth discussion of the unique modeling architecture that emerged from this project –an architecture that provides explicit insight into the structure and content of the knowledge space that is constructed by the JTF staff. As part of this discussion, the report addresses the scenario-based knowledge elements that comprise the "ideal world" reference standard for measuring the quality of the operational plan. The technical report includes a number of appendices that provide details of the model task descriptions and the baseline input data –e.g., staff actor characteristics, scenario-based knowledge elements, etc. A model user manual is provided as a separate, stand-alone document under this project.

Finally, a brief word is in order regarding the name given to this research project: *Project Gnosis*. The word "γνώσις" comes from the Greek language and means "knowledge" or "insight." The word is particularly appropriate since the goal of this project was to create a model that explicitly and analytically captured the contribution of JTF staff knowledge or insight to the creation of a set of operational orders in a complex, multi-dimensional scenario.

MODELING ARCHITECTURE

The modeling architecture for representing the sensemaking and knowledge creation process within a JTF command system is motivated by research findings that emerged from the Phase-I SBIR study preceding this project (Leedom, 2004). This study found that sensemaking and knowledge creation can be defined as a multidimensional—or system-of-systems—process of developing operational understanding in a complex and evolving battlespace. Specifically, this process can be characterized in terms of the following system of systems:

- *Cognitive System* Sensemaking and knowledge management can be viewed as the process of collecting, filtering, interpreting, framing, and organizing available information into actionable knowledge for command decision making.
- *Operational System* Sensemaking and knowledge management can be viewed as an active and dynamic process in which the commander is attempting to construct and impose a specific intent or reality against a reactive adversary.
- *Social System* Sensemaking and knowledge management can be viewed as the process of reconciling and integrating multiple stakeholder perspectives into a common operational vision that is driven by command intent.
- *Organizational System* Sensemaking and knowledge management can be viewed as the process of building up appropriate bodies of staff expertise, equipping those bodies with effective information systems and collaboration technology, and efficiently structuring the knowledge management and decision making process rhythms of those bodies.

Together, these various systems combine and interact to produce the knowledge needed to command joint military operations. Since they act together as a system-of-systems entity, each component must be addressed and understood in terms of its influences and contributions. Accordingly, the analytical modeling of sensemaking and knowledge creation within an organization such as a JTF command system should be approached from a multidimensional point of view—one that considers the cognitive, operational, social, organizational systems and their interactions. The following discussion outlines the approach taken in *Project Gnosis* to reflect each of these aspects in the modeling architecture that emerged from this work. Selected references are given in this document to the underlying theories that motivated the modeling architecture. For a more complete discussion of these theories, the reader is referred to the Phase-I study's technical report.

MODELING THE COGNITIVE ASPECTS OF SENSEMAKING AND KNOWLEDGE CREATION

Sensemaking and knowledge creation are essentially cognitive processes that take place at the individual level, although (as discussed later) it is appropriate to consider the social process of forming a shared understanding when specific individuals collaborate within an organization. In the present project, individual cognition is reflected in terms of how individual staff actors are characterized in their ability to mentally recognize a set of inputs (represented as a set information elements or cues) and, through application of their individual experience and tacit expertise, generate a set of outputs (represented as an associated set of knowledge declarations). This is considered the essential process of knowledge creation in the present project. In terms of

modeling knowledge creation tasks, the generation of causal linkages between a set of task input and outputs forms the fundamental modeling paradigm by which individual expertise is represented analytically. The use of a cue recognition paradigm for modeling the tacit expertise or knowledge of specific staff actors within the model is motivated by three areas of cognitive research: (1) the recognition-primed model of sensemaking developed by Winston Sieck and a team of researchers from Klein Associates (Sieck et al, 2004), (2) the multiple-trace model of schema abstraction of Douglas Hintzman (1986), and (3) the vector-activation model of tacit knowledge developed by Haridimus Tsoukas (2002). By applying this paradigm in a recursive manner, the model traces the mental process by which high-level abstract concepts or ideas are successively decomposed into a lower—and more detailed—elements of knowledge that can be translated into action.

A simple illustration of how this process is modeled is shown in Figure 1. The analytical functioning of this paradigm is similar to the functioning of a Leontief input-output matrix in economics. On the left, the task input stimuli (in the form of a vector of binary values) represents the current knowledge state of the actor at a certain level of knowledge abstraction. The vector is defined by the set of ideas—say, candidate endstates of a military operation—that are potentially relevant to the JTF. The “1”s and “0”s within the vector represent which of these ideas are currently “activated” in the actor’s situational awareness or understanding. In turn, this set of activated knowledge elements serves as mental cues for triggering other mental associations – say, the type(s) of centers of gravity that are potentially associated with each desired endstate in the operation. The matrix shown in Figure 1 represents the actor’s tacit expertise –or his ability to mentally associate each of these input cues with another set of meaningful knowledge elements. Thus, using the illustration of desired endstates and centers of gravity, the “1”s shown within the matrix reflect those areas where the staff actor’s area of expertise would allow him to mentally recognize that a valid association exists. The resulting matrix multiplication of the task input vector times the tacit knowledge matrix produces, in turn, another vector of binary values that reflects the new knowledge created during this mental task. Here, the “1”s and “0”s within the output vector represent the actor’s situational awareness or understanding of which centers of gravity are now “recognized” as being relevant to the operation. The output vector (or knowledge state) of this task then serves as the input to a subsequent task where additional tacit knowledge is used to mentally associate (decompose) the recognized centers of gravity with specific supporting PMESII (*i.e.*, political, military, economic, social, etc.) functions that must be engaged in order to achieve desired effects against each center of gravity. As noted above, the recursive application of this Leontief input-output paradigm allows the model to represent the process by which high-level abstract ideas—*e.g.*, command intent expressed in terms of “recognized” operational objectives—are successively decomposed into a set of lower-level knowledge elements –*e.g.*, specific “recognized” battlespace objects and actions targeted against those objects. [Note, the next section of this discussion introduces and outlines the specific knowledge structure assumed in the model to decompose the overall operation.]

The matrix shown in Figure 1 represents the “ideal world” in which mentally associations are deterministically formed. In the real world, such mental associations are better represented as a stochastic process that reflects the area and level of expertise of the staff actor performing the mental task. Such an arrangement is illustrated in Figure 2 where the “1”s have been replaced by specific probability functions that yield an association value. Missing or zero probability values indicate a situation where a specific input cue falls outside of the staff actor’s area of experience

or expertise. The remaining non-zero values represent the mean likelihood that the staff actor would recognize a specific input cue and be able to mentally associate it with a specific output knowledge element.¹ Here, the association strength computed within each cell of the matrix reflects the relative level of expertise (e.g., novice versus expert) that the staff actor possesses in each area of task cues. Thus, the operational expertise of each staff actor within the JTF command system can be simply represented in terms of a series of stochastic input-output matrices required for performing the different types of mental tasks required of that staff actor in the JTF planning process.

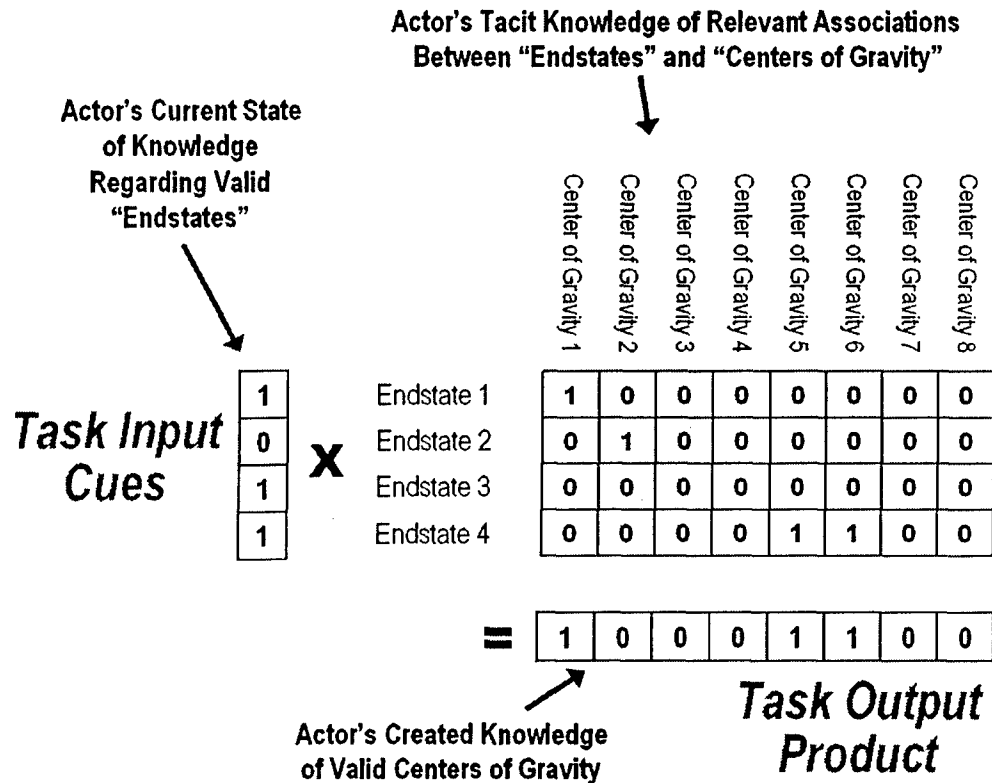
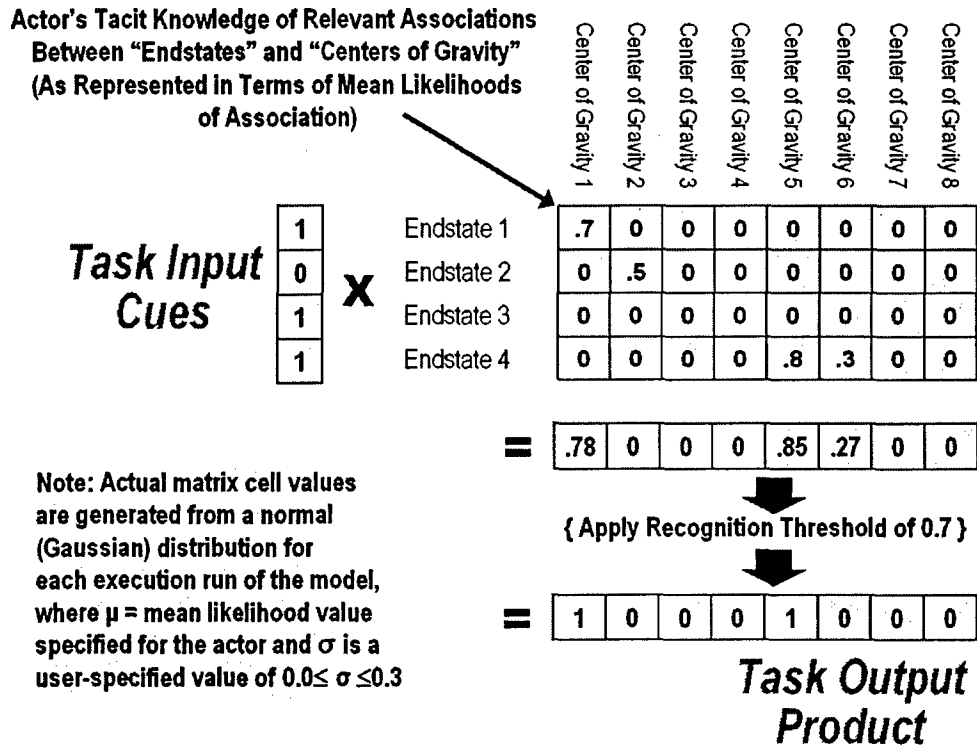


Figure 1 Modeling Paradigm for Representing Staff Actor Knowledge Creation

Using a matrix of this form to represent the expertise of an individual staff actor allows the analyst to do several things. First, the process of invoking the matrix to transform a set of input cues into a corresponding set of output knowledge products can be represented stochastically – i.e., the mean likelihood values can be used with a random number generator in the model to determine the specific knowledge products generated each time the model is executed. Alternatively, the output of the normal distribution function can be compared against a “threshold value” that is specified by the analyst. This threshold value, in turn, can be used to reflect the amount of deliberation time allowed for the process. For example, a low threshold value allows a greater number of associations to be recognized and would correspond to a situation in which the staff actor was given ample time to ponder the set of input cues. Conversely, a high threshold value allows fewer associations to be made and would correspond to a situation in which the staff actor was given little time to ponder the set of input cues. This strategy is

¹ A normal (Gaussian) distribution function is assumed with a mean, μ , set equal to the value specified in the matrix cell and a standard deviation, σ , set equal to a user-specified input value (typically $0 \leq \sigma \leq 0.3$).

reflected in the baseline model architecture in order to allow the analyst to specify either a deliberate or hasty planning assumption. In modeling terms, this simply means that the computed values in the output vector are rounded up to a value of 1 or truncated to a value of 0, depending upon whether or not they meet the threshold value specified by the model user. For example, in the illustration shown in Figure 2, an association strength of 0.27 is computed stochastically for "Center of Gravity 6." However, since this value does not exceed the specified threshold, it is truncated to a value of 0 to indicate that it has not reached the level of "recognition" by the actor. The general manner in which the threshold value influences staff actor performance is shown in Figure 3.



Note: Actual matrix cell values are generated from a normal (Gaussian) distribution for each execution run of the model, where μ = mean likelihood value specified for the actor and σ is a user-specified value of $0.0 \leq \sigma \leq 0.3$

Figure 2 Stochastic Paradigm for Representing Knowledge Creation

As indicated earlier, the analyst can adjust the pattern of mean likelihood values to reflect specific areas and levels of expertise for each staff actor. In this manner, the analyst is able to accommodate a variety of personnel factors such as (1) the level of staff actor training and (2) the length of operational assignments. For example, a lower ranked staff officer might reflect a novice level of expertise, whereas a more senior officer might be specified to have a wider range of expertise. Similarly, staff officers only recently assigned to a JTF headquarters might be considered to have lower probability values, whereas a staff officer who has spent considerable time in the area of operations might have a significantly high likelihood of interpreting a set of input cues in terms of meaningful knowledge outputs.

Finally, the analyst can use this type of matrix to specify other forms of expertise that might be available to the JTF command system. For example, a computer-based decision aid or existing knowledge base—e.g., an Operational Net Assessment (ONA) database—can be modeled as a non-human staff actor. In this case, the mean likelihood values would be set at a very high level to indicate those relationships or associations specified in the computer-based decision aid or

existing knowledge base. By executing the model with and without the presence of such an actor, the analyst can assess the contribution of the decision aid or knowledge base to overall JTF command system effectiveness.

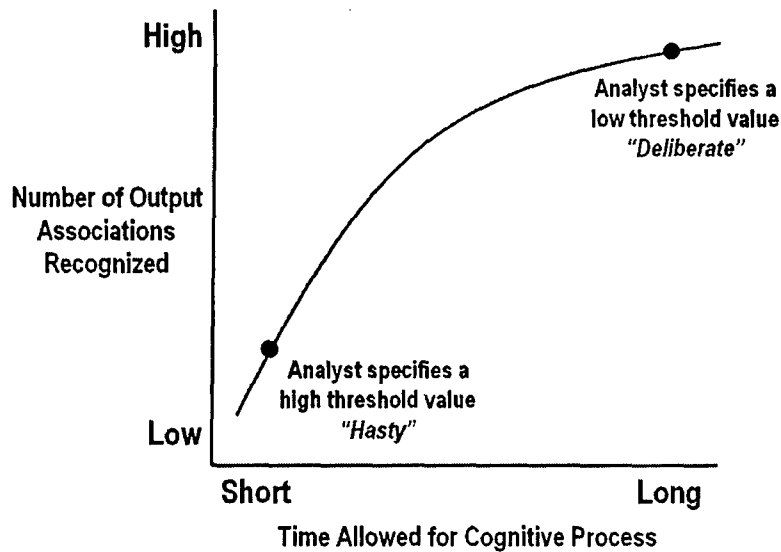


Figure 3 Staff Actor Performance as a Function of Task Time

MODELING THE OPERATIONAL ASPECTS OF SENSEMAKING AND KNOWLEDGE CREATION

The specific cognitive processes that take place within a JTF command system are shaped or structured by the nature of the operational problem space. The process begins with the receipt of a set of strategic goals or objectives that have been assigned by the National Command Authority (NCA). The process culminates with the development and issuance of a specific set of tasking orders that specify the actions to be carried out by each of the subordinate military commands or (in some cases) by the diplomatic, economic, and information media agencies that are supporting the operation. In order to move from the beginning to the culmination of this process, the JTF staff must engage in a series of planning activities that systematically decompose the NCA objectives into meaningful knowledge elements that comprise what might be termed “the battle calculus” of the operation. In the present project, the modeling architecture for representing this decomposition follows the general form of Rasmussen’s abstraction hierarchy, identified and described in Phase I of this modeling project (Rasmussen *et al*, 1990). Here, Rasmussen and his research cohorts define a cognitive work space in terms of several dimensions, one of which is *means-ends relations*. These relations —expressed in terms of several levels of abstraction—are considered important when dealing with discretionary decision making —the type that typifies much of the decision making within a JTF planning process.

To provide further structure to the knowledge elements within this discretionary decision space, the modeling architecture adopts several ideas found in the military literature. The first idea comes from the writings of Major General Honoré (Honoré, 2002). Describing the process of mentally visualizing the battlespace, Honoré describes the importance of (1) visualizing each operation from the current state along a line of operations to the end state, (2) seeing the adversary in terms of centers of gravity (primary sources of moral or physical strength, power,

and resistance), capabilities, requirements, and vulnerabilities in order to determine decisive points that can be connected to form a line of operations, and (3) seeing one's own resources that can be employed to impose one's will on the adversary. Addressing the recently popular term of effects-based operations (EBO), Buster McCrabb notes that the mental visualization of the battlespace "*spans the gamut of military operations from humanitarian relief to major theatre war. It accounts for lethal and non-lethal applications of force delivered kinetically or via non-kinetic modes. EBO incorporates and expands upon traditional approaches such as targets-based and strategy-to-task. ...The goal of an effects-based approach is tracing and understanding how those actions affect the attacker or enemy commander's behavior. Functions are defined as broad, fundamental, and continuing activities. Processes, or activities, are how work—tasks—is done. For commanders, the most basic activities are planning, executing, and assessing operations. EBO is a method for accomplishing those tasks.*" (McCrabb, 2002) A similar idea is found in Joint military doctrine which states that "*The most effective method for planners to conduct an analysis of the adversary's centers of gravity to identify its critical vulnerabilities is to visualize the centers of gravity in terms of a system —i.e., what are its functional components (critical requirements) and how do they relate to one another? What elements within this 'system' protect, sustain, or integrate its various elements or components? Once a detailed systemic analysis is completed, the planners should then try to identify the critical vulnerabilities within that system.*" (JCS, 2002) Finally, the recent development within US Joint Forces Command (USJFC) of the Operational Net Assessment (ONA) database concept provides formal structure to the ideas expressed by Honoré, McCrabb, and others. Specifically contained within their description of a future JTF command system is the concept of a database that analytically links command intent with action: "*ONA development is a collaborative process that relies on interaction among a number of participants, both within and external to the [JTF headquarters]. The ONA Working Group... is a cross-functional organization that meets collaboratively to build the baseline ONA by linking nodes to effects; identifying potential Diplomatic, Informational, Military, and Economic (DIME) options; linking actions to effect-node pairs; identifying secondary and unintended consequences for effects of effect-node-action linkages; applying resources to effect-node-action linkages; and updating the ONA.*" (USJFC, 2004)

Working within the abstraction framework suggested by Rasmussen and the guidance offered by the various military references, it is possible to envision the JTF planning process in terms of a hierarchy of associated knowledge elements. The general structure of this hierarchy is illustrated in Figure 4, as it has been manifested in the modeling architecture. Beginning with the set of NCA objectives, each objective is considered to be mentally associated with a desired endstate, an abstract statement describing some condition of the battlespace that defines successful achievement of the objective. Each desired endstate is then mentally associated with one or more specific centers of gravity that represent the major points at which an adversary or situation can be operationally influenced in order to achieve the desired endstate. Centers of gravity are still considered to be somewhat abstract in nature; however, from the point of view of simulating the construction of actionable knowledge, they constitute an important object to be represented in the model architecture.

Knowledge Elements within JTF Problem Space

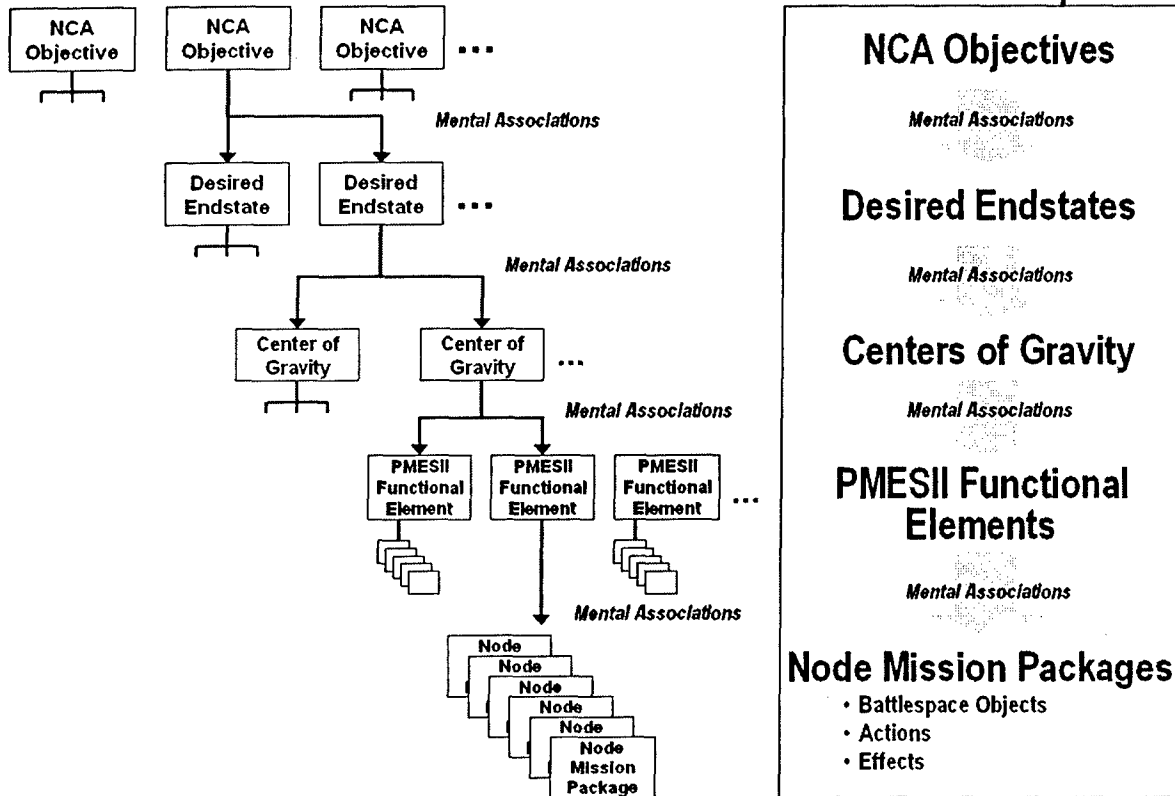


Figure 4 Decomposition of Knowledge Elements within the JTF Problem Space

Continuing in this manner, centers of gravity are further decomposed into a set of supporting PMESII functional elements. These knowledge elements refer to various political, military, economic, social, information, and infrastructure functions within the battlespace that support a particular center of gravity. Hence, the mental association of these functional elements with a specific center of gravity constitutes an important cognitive process to be represented in the modeling architecture. Finally, the lowest level within the knowledge structure consists of the specific node mission packages that are deemed necessary for influencing the PMESII functional elements in a specific way. Each node mission package is defined in terms of a specific type of battlespace object (*e.g.*, a political figure, a military installation, a unit of the adversary’s military or insurgency force, a construction site), a specific action to take against that object (*e.g.*, diplomatic initiative, air mission, ground mission, Special Forces mission, contractor project), and a specific desired effect that the action is to achieve against the object (*e.g.*, negotiate, destroy, capture, rebuild).

In order to provide a reference standard for assessing the performance of the JTF planning process, the modeling architecture presumes that the analyst will first define the operational scenario in terms of an “ideal world” knowledge structure. That is, the analyst defines the operational scenario in terms of a completely populated hierarchy of knowledge elements and their corresponding associations. This “ideal world” knowledge structure defines the correct associations that would be made at each level of knowledge creation if the JTF staff had unlimited time and perfect expertise with which to perform the planning process. It should be

noted at this point of the discussion that the different "levels" of knowledge elements defined within this framework roughly correspond to knowledge products developed at different stages in the JTF planning process. For example, the desired endstates and associated centers of gravity correspond to important elements of the JTF Commander's Guidance. Similarly, the decomposition of centers of gravity into the associated PMESII functional elements corresponds to important elements of the Prioritized Effects List developed by the JTF's core planning group. Continuing further down this hierarchical structure, the identification of node mission packages to be focused against each of the PMESII functional elements corresponds to the essential knowledge elements reflected in the Joint Prioritized Target List. Finally, the assignment of node mission packages to specific subordinate commands under the JTF command structure and the compositional definition of resources (two processes not depicted in Figure 4 but included in the model) roughly correspond to the product of the course of action analysis and weaponeering analysis phase of the JTF planning process.

As such, this structure provides a standard framework for specifying individual staff actor expertise as discussed in the preceding section. That is, the "real-world" expertise of each staff actor is specified relative to this reference standard by entering appropriate mean likelihood values that correspond with the various association linkages. Using the Leontief matrix structure discussed earlier, the knowledge elements identified at one level of this hierarchy become the "input cues" for identifying the next lower level of knowledge elements. This iterative process repeats between each level of the hierarchy extending from the NCA objectives down to the node mission packages. Because the staff actors are characterized as recognizing these association linkages with less than perfect ability, the resulting knowledge structure produced in any given model execution will always be less populated than the "ideal world" reference standard. That is, the resulting knowledge structure produced by the JTF staff will typically reflect "missing knowledge elements" at each level because of the limited expertise of the staff actors. In this fashion, the degree of completeness (or incompleteness) provides an appropriate method for measuring and assessing JTF staff performance. As will be discussed later, the quality of the operational plan (actionable knowledge structure) produced by the JTF command system depends strongly on which staff actors effectively contribute their expertise to specific steps in the planning process.

In addition to specifying which knowledge elements are correctly identified and associated within the overall knowledge structure produced by the JTF staff, the modeling architecture also concerns itself with the notion of unintended negative consequences—as highlighted earlier in brief discussion of the ONA database. Negative, unintended consequences are assumed within the modeling architecture to arise from improper vetting of the battlespace functions and objects relative to the rules-of-engagement specified for the JTF command system. Thus, within the modeling architecture, specific staff actors are characterized in terms of having awareness of which PMESII functional elements and which battlespace objects have been declared "restricted" because of a particular rule-of-engagement. If the staff actor effectively contributes to the planning process, their awareness results in a particular PMESII functional element or node mission package being deleted from the operational order produced by the JTF command system. Conversely, if the staff actor is prevented from effectively contributing to the planning process, then a "restricted" PMESII functional element or battlespace object is inadvertently included in the operational order. Because the modeling architecture does not represent in detail the actual engagement of specific battlespace objects (and their resulting consequences), it is

merely assumed that the inadvertent inclusion of a “restricted” PMESII functional element or battlespace object detracts from the overall performance of the JTF command system.

Finally, it should be noted that the model architecture presumes that each of these various battlespace knowledge elements reflect differing degrees of operational importance. As described in more detail later, the operational weighting scheme assigns various “priority values” to desired strategic endstates and centers of gravity to determine their relative contribution to campaign success. Additionally, the weighting scheme specifies how much each PMESII functional element contributes to its parent center of gravity. As these values are associated downward to the node mission packages, it then becomes possible to compute an “operational score” for each node mission package. As node mission packages are identified, added to the resulting operational plan, and then subsequently successfully executed within the model, this weighting scheme provides a method for tracking the operational progress of the campaign –e.g., the “operational scores” of the successfully executed node mission packages are summed and compared against the total possible score value (ideal world) to measure the relative success of the JTF planning process.

For the present project, a four-phase operational scenario was developed and articulated in terms of an “ideal world” knowledge structure. Figures 5 and 6 summarize each phase of this baseline scenario in terms of general thrust and number of knowledge elements specified at each level within the reference knowledge framework. As can be seen from these illustrations, the number of branches within the JTF knowledge framework grows significantly as one moves from the level of NCA objectives to the level of node mission packages. It is also noted in Figure 6 that the number of node mission packages that must be potentially considered by the JTF command system in Phase 4 of the scenario (*Stability and Reconstruction*) is significantly greater than the corresponding number of node mission packages in Phases 1-3. A complete description of the scenario knowledge elements is presented in Appendix A. This baseline scenario was used for all subsequent model development and testing activities during the current project.

Setting Conditions for Success	Initial Forced Entry	Decisive Operations	Stability and Reconstruction
NCA Objectives <ul style="list-style-type: none"> • Shape battlespace • Regional diplomacy 	NCA Objectives <ul style="list-style-type: none"> • Conduct deception campaign • Conduct initial forced entry • Set conditions for follow-on 	NCA Objectives <ul style="list-style-type: none"> • Eliminate WMD capability • Eliminate regime power • Neutralize combat divisions • Secure natural resources • Protect/sustain civilians • Establish law/order • Protect coalition logistics 	NCA Objectives <ul style="list-style-type: none"> • Defeat violent spoilers • Co-opt nonviolent spoilers • Establish next-state conditions • Develop international support
Desired Endstates <ul style="list-style-type: none"> • Air/sea superiority • Persistent ISR • Insurgency alignment • Capitulation/neutrality • Population support • Initial deployment • Host nation agreements • Neutrality agreements 	Desired Endstates <ul style="list-style-type: none"> • Fix adversary forces • Air/sea superiority • Persistent ISR • Eliminate WMD threat • Degrade regime leadership • Amphibious assault • Airmobile assault • Build Insurgency axis • Key leader capitulation • Build population support • Build humanitarian base • Protect national resources • Protect minority population 	Desired Endstates <ul style="list-style-type: none"> • WMD under positive control • Regime leaders neutralized • Regime party neutralized • Divisions capitulated or destroyed • Protect national resources • Keep population in homes • Humanitarian relief • Protect minority population • Destroy terrorist base • Stop foreign infiltrators • Apprehend criminals • Protect convoys / assembly areas 	Desired Endstates <ul style="list-style-type: none"> • Isolate/defeat spoilers • Restrain disruption agents • Civil law/order • Public infrastructure • Public health services • Internal security forces • Economic development aid • PVO/NGO synchronization

Figure 5 Summary of “Ideal World” Knowledge Elements within JTF Problem Space - Part I

Setting Conditions for Success	Initial Forced Entry	Decisive Operations	Stability and Reconstruction
Centers of Gravity <ul style="list-style-type: none"> • Adversary airpower systems • Adversary seapower systems • Key areas of interest • Internal insurgency forces • Key admin/military officials • Civilian population • US/coalition forces • Country Green • Country Orange 	Centers of Gravity <ul style="list-style-type: none"> • Eastern border surveillance • Eastern combat divisions • Eastern advance routes • Adversary airpower systems • Adversary seapower systems • Key areas of interest • WMD stockpiles/delivery systems • Top regime leadership • Western border defense • Western security forces • Western paramilitary • Key airfield defenses • Southern paramilitary • Capital area paramilitary • Western/southern leaders • Cultural/religious support • Key route traffic • Country Green staging areas • Resource infrastructure • Ethnic neighborhoods 	Centers of Gravity <ul style="list-style-type: none"> • WMD stockpiles/delivery systems • WMD labs/production • Key regime actors • Political/financial networks • Capital area paramilitary • Capitulating divisions • Resisting divisions • Resource infrastructure • Key population leaders • Civilian refuge traffic • Distribution relief areas • Ethnic neighborhoods • Terrorist operations • Foreign infiltration cells • Criminal networks • Coalition supply convoys • Coalition assembly areas 	Centers of Gravity <ul style="list-style-type: none"> • Neighborhood intelligence • Operating spoiler cells • Insurgency attack sites • Ethnic communication • Spoiler organizations • Major disruption sites • Civil administration • National police force • Electricity/water/sewage • Information networks • Public education • Transportation networks • Public health systems • National military forces • Key economic sectors • PVO/NGO organizations
See Appendix B for detailed description of PMESII Functional Elements, Node Mission Package Classes, Node Mission Packages, and Operational Sorties			
PMESII Functional Elements <ul style="list-style-type: none"> • 54 functional elements 	PMESII Functional Elements <ul style="list-style-type: none"> • 61 functional elements 	PMESII Functional Elements <ul style="list-style-type: none"> • 43 functional elements 	PMESII Functional Elements <ul style="list-style-type: none"> • 55 functional elements
Node Mission Package Classes <ul style="list-style-type: none"> • 59 node classes 	Node Mission Package Classes <ul style="list-style-type: none"> • 64 node classes 	Node Mission Package Classes <ul style="list-style-type: none"> • 45 node classes 	Node Mission Package Classes <ul style="list-style-type: none"> • 61 node classes
Node Mission Packages <ul style="list-style-type: none"> • 488 mission packages 	Node Mission Packages <ul style="list-style-type: none"> • 610 mission packages 	Node Mission Packages <ul style="list-style-type: none"> • 501 mission packages 	Node Mission Packages <ul style="list-style-type: none"> • 2918 mission packages

Figure 6 Summary of “Ideal World” Knowledge Elements within JTF Problem Space - Part II

MODELING THE SOCIAL ASPECTS OF SENSEMAKING AND KNOWLEDGE CREATION

Sensemaking and knowledge creation within an organization or large-scale system frequently involves multiple experts and/or stakeholders coming together to reconcile multiple viewpoints on a situation. At the same time, individual analysts and planners will often collaborate within specific communities of interest to pool their available information and experience. In this manner, the resulting understanding that emerges from this process is more robust than that which could be produced by an individual. Such communities of interest can form on a spontaneous or *ad hoc* basis, or they can be consciously managed through the deliberate formation of specific review and advisory boards, working groups, and planning cells.

For the purposes of this project, a community of interest is defined as a group of individuals—each holding different areas and levels of expertise—that comes together to address and resolve a specific problem or issue. As discussed later, many such communities of interest exist within a JTF command system to accomplish different steps in the planning process. At the heart of any community of interest is the socio-cognitive process of integrating and reconciling various bodies of expertise so that they might be used to form a shared understanding of the specific problem or issue of interest. This process is considered cognitive in nature because it is the tacit knowledge of each participant that is being made explicit and used to form a shared understanding. The process is also considered social in nature because various social factors influence the degree to which each participant contributes to this group process. In the present project, the modeling architecture accommodates both aspects of this socio-cognitive process.

From a cognitive perspective, the modeling architecture assumes that each staff actor is uniquely characterized in terms of the Leontief input-output matrices described earlier. These matrices are defined relevant to each specific knowledge creation task reflected in the modeling architecture and provide the analytical basis for computing a set of knowledge products from a set of input cues. Thus, if a given staff actor is considered to be potentially available for participating in a certain type of knowledge creation task in the model, then a corresponding input-output matrix must be defined for that staff actor against that specific task. When multiple staff actors collaborate on the same knowledge creation task, the modeling architecture first reconciles their individual input-output matrices into a single matrix (defined as the group consensus knowledge matrix). Then, as illustrated in Figure 7, the modeling architecture completes the task by applying the group consensus knowledge matrix against the task input cues.

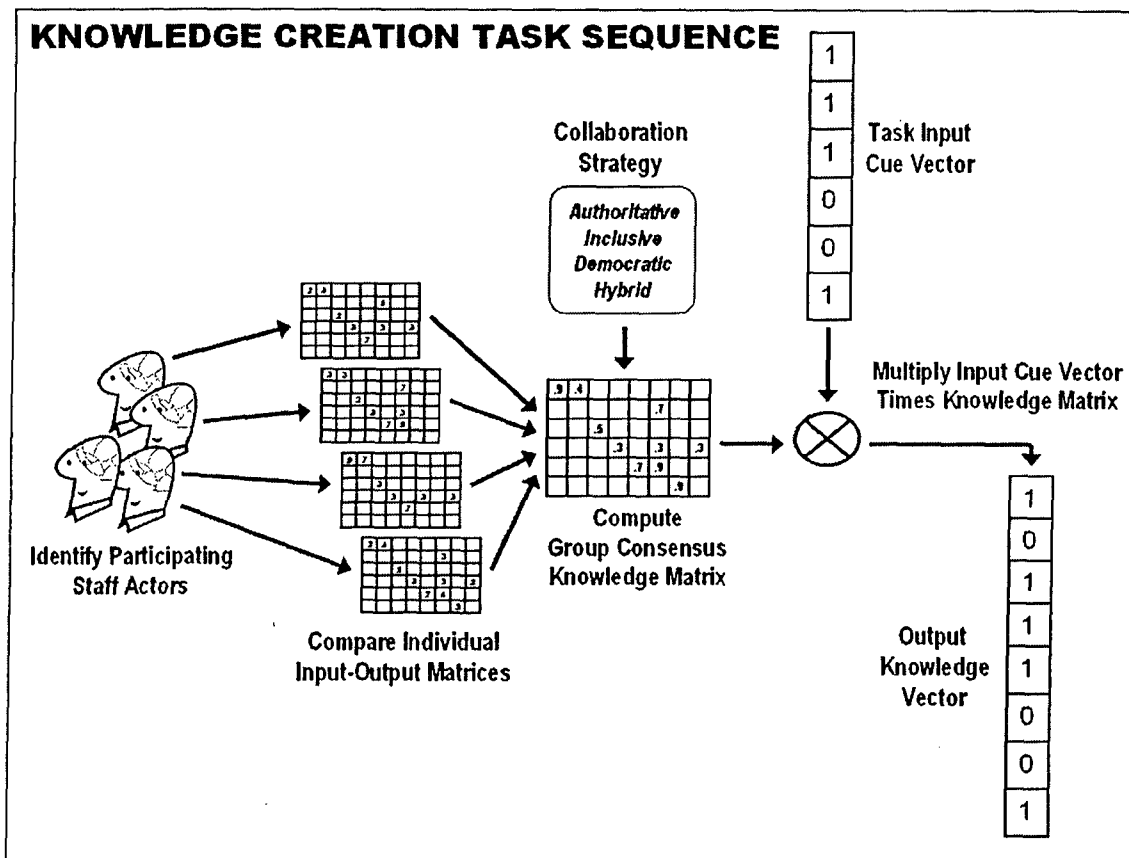


Figure 7 Knowledge Creation Task Collaboration Model

Four alternative strategies are included in the modeling architecture for reconciling a set of individual input-output matrices into a single group consensus knowledge matrix. These strategies reflect different forms of collaboration and include the following:

- *Authoritative Strategy*: The ranking staff actor's matrix is used as the group consensus knowledge matrix, while the matrices of the other participants are ignored. (Note: A defined attribute of each staff actor is the actor's formal military rank.) Such a strategy assumes that the ranking staff actor will dominate the community of interest by virtue of their formal rank within the organization. Figure 8 lists the range of formal military ranks considered in the model.

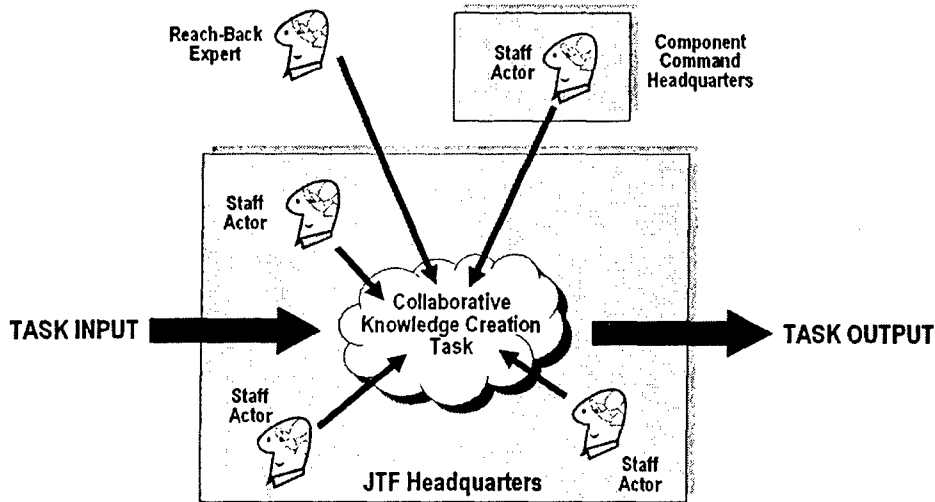
- *Inclusive Strategy*: The matrices of the participating staff actors are compared on a cell-by-cell basis, and the maximum probability value occurring within any of these matrices is used for the group consensus knowledge matrix. Such a strategy assumes that each participating staff actor contributes according to their relative areas and levels of expertise. This strategy achieves the highest overall performance in terms of recognizing input cues.
- *Democratic Strategy*: The matrices of the participating staff actors are compared on a cell-by-cell basis, and the numerical average of the probability values occurring within these matrices is used for the group consensus knowledge matrix. Such a strategy assumes that each participant mutually exerts influence on every other staff actor in the community of interest. Hence, the group is assumed to move in each case toward an average likelihood of recognizing specific input cues.
- *Hybrid Strategy*: The matrices of the participating staff actors are compared on a cell-by-cell basis, and the rank-weighted numerical average of the probability values occurring within these matrices is used for the group consensus knowledge matrix. This strategy is similar to the democratic strategy, except that the formal rank of each staff actor is used to weight the influence of that individual's probability values on the computed average value. Such a strategy assumes that participants mutually influence each other, but do so according to their formal rank within the organization.

Formal Rank

10	General or Ambassador
9	Lieutenant General
8	Major General
7	Brigadier General
6	Colonel
5	Lieutenant Colonel
4	Major or Chief Warrant Officer 4-5
3	Captain or Chief Warrant Officer 2-3

Figure 8 Range of Staff Actor Ranks

In addition to reflecting different collaboration strategies, the model architecture also considers a number of different obstacles to effective collaboration. As illustrated in Figure 9, each actor that can potentially participate in a specific knowledge creation task is first assessed in terms of six types of collaboration obstacles: (1) the cognitive capacity of the actor to comprehend the task, (2) the level of trust or familiarity of the actor within the JTF organization, (3) the existence of parochial barriers that inhibit the actor, (4) the social currency of the actor within the community of interest, (5) the communications connectivity of the actor, and (6) the expressive power of the collaboration tools through which the actor participates. Each of these obstacles is represented in terms of a probability value that, when combined with the other probability values, reflects the likelihood that a specific staff actor will effectively contribute his knowledge to the task. The actual process is represented in a stochastic manner in the model. That is, the computed likelihood of effective contribution is compared against a random number generated by the model to determine if a specific staff actor actually participates in an assigned knowledge creation task.



$$\text{Probability of Effective Contribution} = \{ P_{\text{CogCap}} \times P_{\text{Trust}} \times P_{\text{Parochial}} \times P_{\text{Social}} \times P_{\text{Connect}} \times P_{\text{Express}} \}$$

Figure 9 Staff Actor Collaboration Obstacles

Figure 10 summarizes the range of values available for selection in the model (available values annotated along each scale). Thus, for each staff actor defined in the model, the user can uniquely characterize that actor in terms of the six scales shown in Figure 10. This flexibility, in turn, allows the model user to parametrically explore the impact of such factors as personnel assignment policy, level of training and experience, communication network reliability, inter-agency cooperation, degree of collaboration tool sophistication, and so forth.

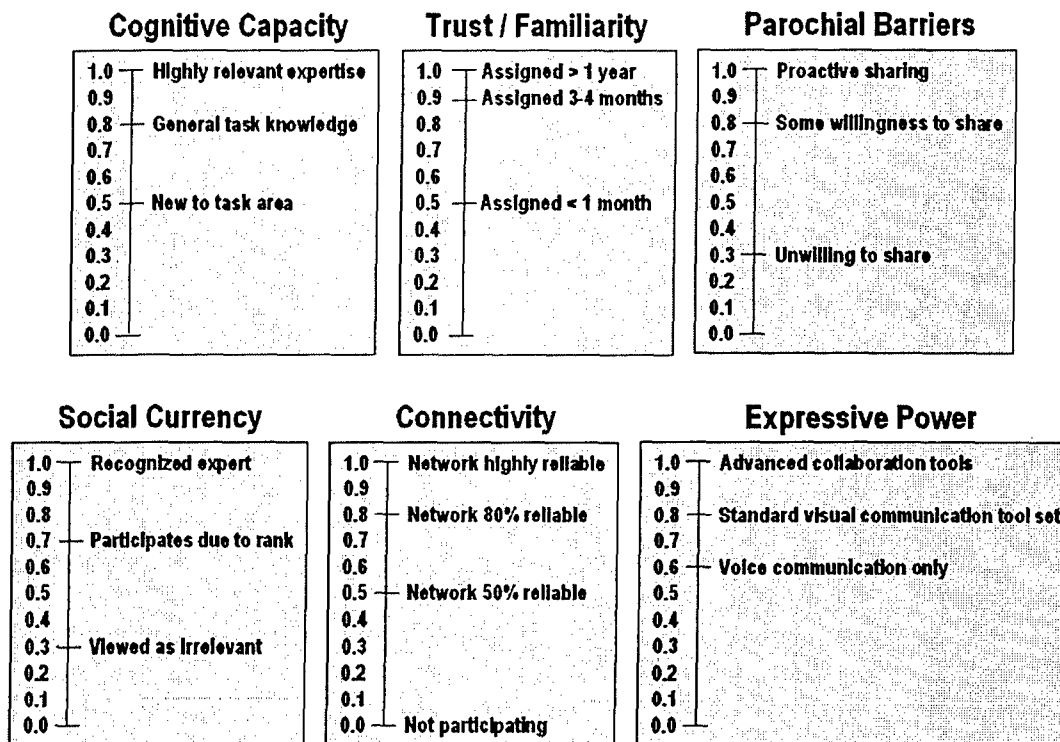


Figure 10 Collaboration Obstacle Levels Available in Model

MODELING THE ORGANIZATIONAL ASPECTS OF SENSEMAKING AND KNOWLEDGE CREATION

Sensemaking and knowledge creation within an organization will depend upon the specific population of staff actors and experts available to that organization plus the manner in which these staff actors and experts are functionally organized into specific communities of interest. In the present project, we conducted a review of relevant Joint and Service documents to identify the types of staff actors that might be available to the JTF planning process (Eggleston, 2005; Dept of Army, 2003, 2005; Joint Chiefs of Staff, 2002a, 2002b; Phister *et al*, 2001; Secretary of the Air Force, 2004a, 2004b; US Army War College, 2000; US Joint Forces Command, 2002, 2003a, 2003b, 2004). These documents—some of which were still in the draft stage—provided insight into Joint and Service thinking about future organizations and processes. It should be emphasized, however, that the set of staff actors and planning tasks identified through this review are notional in nature—that is, they reflect an amalgamation of emerging Joint and Service concepts outlined for future operations. In some cases, it became clear during this review that certain staff functions and positions were duplicative when Joint organizational structures and processes were compared side-by-side with their Service counterparts. It is further evident that considerable attention needs to be given to reconciling Joint and Service concepts if they are to produce an effective and efficient sensemaking process.

Nevertheless, it was possible to gain a general understanding of how sensemaking and knowledge management might be undertaken in a future JTF command system. As a result, the specific organizational structure that was adopted for the present modeling work largely follows the structure outlined for a future JJTF headquarters, but with key Service planners and experts assumed to be integrated in via a network-centric planning structure. As a result, the organizational process and staff structure that emerged within this project should not be interpreted as endorsing one particular command and staff arrangement over another. Rather, the emerging structure attempts to capture the essence of how a future JTF planning process might be functionally organized and staffed. Similarly, it should not be assumed that the modeled process and structure would reside within a single headquarters. Rather, the planning process and staff structure reflected in the current modeling project is, perhaps, best thought of as being geographically distributed across several headquarters operating in a network-centric fashion.

The communities of interest reflected within the notional JTF command system are organized by specific steps in the planning process. In turn, each step in the planning process potentially draws staff actor participants from the various working groups, cells, and boards nominally defined within the JTF command system. To illustrate this process, it is first useful to present an overview of the task structure reflected in the JTF model. As shown in Figure 11, knowledge creation within a future JTF command system begins with the receipt of mission orders from the National Command Authorities (NCA) and proceeds along a number of socio-cognitive steps to produce an initial Effects Tasking Order (ETO).² The ETO comprises the mission orders given to the set of component commands for execution. The ETO reflects the prioritized set of actions (organized by effects and battlespace targets) deemed necessary to achieve the mission objectives assigned to the JTF Commander.

² It should be noted that specific terminology such as “Operational Net Assessment” and “Effects Tasking Order” will come into and fall out of common usage as Joint and Service leadership changes over time. The terms adopted for use in this project reflect force development thinking circa 2004-2005.

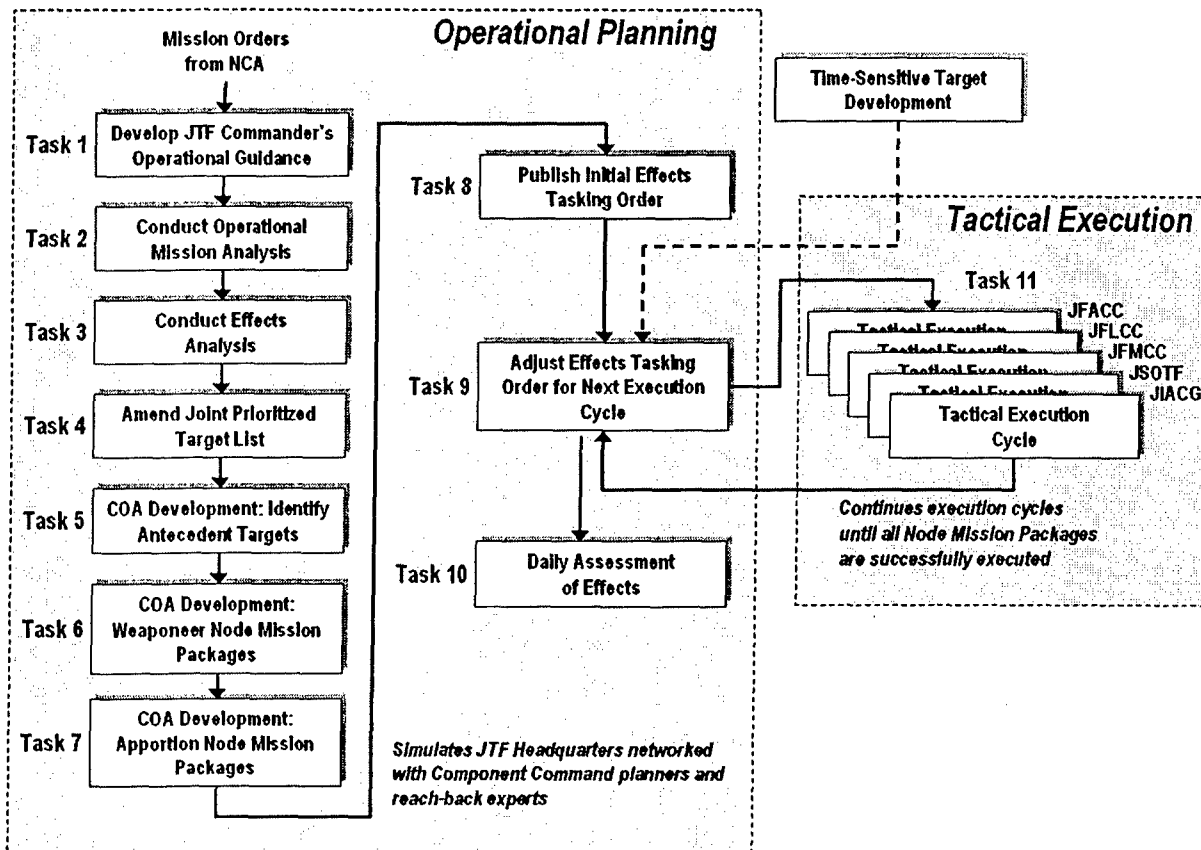


Figure 11 Knowledge Creation Task Sequence within a Notional JTF Command System

In a very real sense, the planning tasks listed in Figure 11 correspond to the hierarchy of knowledge elements described earlier in Figure 4. For example, development of the JTF Commander's operational guidance in Task 1 corresponds to the identification and prioritization of Desired Strategic Endstates and an associated set of Centers of Gravity. Conducting the operational mission analysis (Task 2) corresponds to the translation of Centers of Gravity into a constituent set of PMESII Functional Elements and an associated set of operational effects that are documented in terms of a Prioritized Effects List (PEL). The PEL, in turn, is translated through the effects analysis (Task 3) into a set of battlespace Node Mission Packages that are documented in terms of the Joint Prioritized Target List (JPTL). This process continues through Tasks 4-8 as the JPTL is amended, vetted, and adjusted to account for second-order effects and rules-of-engagement. At the same time, the Node Mission Packages are appropriately matched with action resources available and assigned for execution to specific component commands.³ At the tactical execution level, the ETO is parsed by the component commands and executed in a cyclical fashion. During each execution cycle, the ETO is adjusted in two ways. First, time-sensitive target nominations (generated by the Joint Time-Sensitive Targeting Cell) are inserted into the cycle of operations –thus displacing resources previous earmarked for preplanned Node Mission Packages. Second, re-nominated Node Mission Packages are received from each of the

³ The component commands include the Joint Force Air Component Command (JFACC), the Joint Force Land Component Command (JFLCC), the Joint Force Maritime Component Command (JFMCC), the Joint Special Operations Task Force (JSOTF), and the Joint Interagency Coordination Group (JIACG) that represents the other agencies and departments involved in the operational campaign.

component commands –representing missions that were either (1) scrubbed due to the unavailability of action resources or tactical intelligence or (2) assessed to be unsuccessful in achieving their desired effect. The execution cycles continue within each component command until all of the intended Node Mission Packages are successfully executed. Depending upon the phase of the operational campaign and the extent of the mission objectives, this cyclical process can take only a few days or it can extend over several hundreds of days.

To better understand how the model interprets each operational planning and tactical execution task, Figures 12-22 present a breakdown of each task in terms of the specific knowledge creation steps, staff actions, decisions, and events reflected in the model architecture. Within each of these diagrams, terms bolded and italicized correspond to specific knowledge elements explicitly portrayed in the simulated process.

Task Input	Mission Orders containing summary list of NCA Objectives	
Task Step	Description	Participants
1-1	Receive Mission Orders and Operational Value Scores	JPG Admin Section
1-2	Identify restricted PMESII Functional Elements and Node Mission Packages	Rules-of-Engagement Working Group
1-3	Associate specific relevant Strategic Endstates with each NCA Objective	Joint Coordination Board
1-4	Associate specific relevant Centers of Gravity with each identified Strategic Endstate	Core Joint Planning Group
1-5	Compute Operational Value Score for each identified Center of Gravity	JPG Admin Section
1-6	Assemble and publish Commander's Guidance statement	JPG Admin Section
Task Output	Commander's Guidance containing list of associated Strategic Endstates , associated Centers of Gravity , and restricted PMESII Functional Elements and Node Mission Packages	

Figure 12 Develop JTF Commander's Operational Guidance (Task 1)

Task Input	Commander's Guidance	
Task Step	Description	Participants
2-1	Associate specific relevant PMESII Functional Elements with each identified Center of Gravity	Core Joint Planning Group
2-2	Identify which PMESII Functional Elements are restricted by rules-of-engagement	Rules-of-Engagement Working Group
2-3	Compute Operational Value Score of each identified PMESII Functional Element	Joint Fires & Effects Working Group
2-4	Assign operational effect to each identified PMESII Functional Element	Joint Fires & Effects Working Group
2-5	Publish the Prioritized Effects List	JPG Admin Section
Task Output	Prioritized Effects List that contains the set of identified PMESII Functional Elements , vetted according to rules-of-engagement, and rank-ordered by Operational Value Score	

Figure 13 Conduct Operational Mission Analysis (Task 2)

Task Input	Prioritized Effects List	
Task Step	Description	Participants
3-1	Associate specific relevant <i>Node Mission Package</i> classes with each identified <i>PMESII Functional Element</i>	Joint Fires & Effects Working Group
3-2	Identify which <i>Node Mission Package</i> classes are restricted by rules-of-engagement	Joint Fires & Effects Working Group
3-3	Compute "primary" <i>Operational Value Score</i> for each identified <i>Node Mission Package</i> class	Joint Fires & Effects Working Group
3-4	Identify second-order effects on other <i>PMESII Functional Elements</i> associated with identified <i>Node Mission Package</i> classes	Blue / Red Cell
3-5	Identify which <i>Node Mission Package</i> classes are restricted by rules-of-engagement	Rules-of-Engagement Working Group
3-6	Compute "secondary" <i>Operational Value Score</i> for each identified <i>Node Mission Package</i> class	Joint Fires & Effects Working Group
3-7	Compute "total" <i>Operational Value Score</i> for each identified <i>Node Mission Package</i> class	Joint Fires & Effects Working Group
3-8	Cull redundant <i>Node Mission Packages</i> classes not needed to achieve influence of <i>PMESII Functional Element</i>	Joint Fires & Effects Working Group
3-9	Assign operational effect to each identified <i>Node Mission Package</i> class	Joint Fires & Effects Working Group
3-10	Publish <i>Joint Prioritized Target List</i>	JPG Admin Section
Task Output	<i>Joint Prioritized Target List</i> that contains a set of identified <i>Node Mission Package</i> classes characterized in terms of "primary" and "secondary" <i>Operational Value Scores</i> and vetted according to rules-of-engagement	

Figure 14 Conduct Effects Analysis (Task 3)

Task Input	<i>Joint Prioritized Target List</i> (as developed by JTF staff planning process)	
Task Step	Description	Participants
4-1	Receive <i>Node Mission Package</i> classes nominated by other agencies through the Joint Interagency Coordination Group	Joint Fires & Effects Working Group
4-2	Consolidate target nominations into the <i>Joint Prioritized Target List</i>	JPG Admin Section
Task Output	<i>Joint Prioritized Target List</i> (as amended by nominations from other agencies)	

Figure 15 Amend Joint Prioritized Target List (Task 4)

Task Input	Amended <i>Joint Prioritized Target List</i>	
Task Step	Description	Participants
5-1	Identify specific antecedent <i>Node Mission Package</i> classes required to be engaged prior to currently nominated target set	Joint Fires & Effects Working Group
5-2	Validate and reprioritize antecedent <i>Node Mission Package</i> classes as necessary to insure sequencing of engagement	JPG Admin Section
Task Output	Adjusted <i>Joint Prioritized Target List</i> (amended to include antecedent targets)	

Figure 16 Course-of-Action Development: Identify Antecedent Targets (Task 5)

Task Input	Adjusted <i>Joint Prioritized Target List</i>	
Task Step	Description	Participants
6-1	Identify <i>Primary Action Class</i> (and <i>Component Command</i>) that produces desired effect for each nominated <i>Node Mission Package</i> class	Joint Fires & Effects Working Group
6-2	Estimate number of <i>Sortie Packages</i> required to achieve desired effect by <i>Primary Action Class</i>	Joint Fires & Effects Working Group
6-3	Identify, if applicable, <i>Secondary Action Class</i> (and <i>Component Command</i>) that produces desired effect for each nominated <i>Node Mission Package</i> class	Joint Fires & Effects Working Group
6-4	Estimate number of <i>Sortie Packages</i> required to achieve desired effect by <i>Secondary Action Class</i>	Joint Fires & Effects Working Group
Task Output	Required <i>Sortie Packages</i> estimates (by <i>Primary</i> and <i>Secondary Action Class</i> and <i>Component Command</i>) used to apportion targets to engagement resources	

Figure 17 Course-of-Action Development: Weaponeer Node Mission Packages (Task 6)

Task Input	Adjusted <i>Joint Prioritized Target List</i> and required <i>Sortie Packages</i> estimates	
Task Step	Description	Participants
7-1	Time-order Node Mission Package classes, based on Operational Value Scores (highest engaged first)	Joint Fires & Effects Working Group
7-2	Receive Sortie Package availability estimates for each Action Class	Joint Fires & Effects Working Group
Loop over execution cycles, beginning at D-Day and continuing until all target sets are engaged ← - - - -		
Loop over Node Mission Package classes, beginning with highest priority ← - - - -		
7-3	If Primary Action Class sortie packages are available, assign to Node Mission Package; otherwise, skip to Step 7-4	Joint Fires & Effects Working Group
7-4	If Primary Action Class sortie packages are available, assign to Node Mission Package; otherwise, skip to end of loop	Joint Fires & Effects Working Group
7-5	Decrement available sortie packages, as appropriate, if they are assigned to Node Mission Package class	Joint Fires & Effects Working Group
End of Node Package class loop - - - -		
End of execution cycle loop - - - -		
Task Output	<i>Daily Apportionment Assignment</i> (assigns Node Mission Package class nominations to JFACC, JFLCC, JFMCC, JSOFT, and JIACG for each execution cycle)	

Figure 18 Course-of-Action Development: Apportion Node Mission Packages (Task 7)

Task Input	<i>Daily Apportionment Assignment</i>	
Task Step	Description	Participants
8-1	Assemble staff inputs for <i>Effects Tasking Order</i>	JPG Admin Section
8-2	Conduct JTF Commander's decision briefing	Core Joint Planning Group
8-3	Publish <i>Effects Tasking Order</i> to JFACC, JFLCC, JFMCC, JSOFT, and JIACG	JPG Admin Section
Task Output	<i>Effects Tasking Order</i> (initial assignment of <i>Node Mission Packages</i> by execution cycle to specific <i>Action Classes</i> and <i>Component Commands</i>)	

Figure 19 Publish Initial Effects Tasking Order (Task 8)

Task Input	<i>Effects Tasking Order</i> (as amended and executed during previous execution cycle), re-nominated <i>Node Mission Packages</i> received from <i>Component Commands</i> , and <i>Time-Sensitive Target</i> nominations received from <i>JTF TST Cell</i>	
Task Step	Description	Participants
9-1	Receive re-nominated <i>Node Mission Packages</i> from JFACC, JFLCC, JFMCC, JSOTF, and JIACG (based on previous execution cycle results)	JPG Admin Section
9-2	Insert re-nominated <i>Node Mission Packages</i> into current <i>Daily Apportionment Assignment</i>	Joint Fires & Effects Working Group
9-3	Integrate time-sensitive <i>Node Mission Packages</i> into current <i>Daily Apportionment Assignment</i> (takes precedence over pre-planned target sets)	Joint Fires & Effects Working Group
9-4	Conduct JTF Commander's decision briefing	Core Joint Planning Group
9-5	Publish adjusted <i>Effects Tasking Order</i>	JPG Admin Section
Task Output	Adjusted <i>Effects Tasking Order</i> (amended to include re-nominated target sets and time-sensitive target sets)	

Figure 20 Adjust Effects Tasking Order for Next Execution Cycle (Task 9)

Task Input	Daily <i>Mission Effects Report</i> for <i>Node Mission Packages</i> executed during previous execution cycle	
Task Step	Description	Participants
10-1	Receive daily <i>Mission Effects Report</i> from JFACC, JFLCC, JFMCC, JSOTF, and JIACG	Effects Assessment Cell
10-2	Prepare summary of <i>Node Mission Package</i> progress	Effects Assessment Cell
10-3	Prepare roll-up summary of <i>PMESII Functional Element</i> progress	Effects Assessment Cell
10-4	Prepare roll-up summary of <i>Center of Gravity</i> progress	Effects Assessment Cell
10-5	Prepare roll-up summary of <i>Strategic Endstate</i> progress	Effects Assessment Cell
Task Output	Set of progress metrics that compare operational results against the "ideal world" scenario	

Figure 21 Daily Assessment of Effects (Task 10)

Task Input	Adjusted <i>Effects Tasking Order</i> (received from JTF Headquarters)	
Task Step	Description	Participants
11-1	Obtain actual <i>Sortie Package</i> availability for current execution cycle (for each <i>Action Class</i> conducted by the Component Command)	Component Command
<i>Loop over Node Mission Packages assigned to current execution cycle</i> ← - - - - -		
11-2	If (1) <i>Sortie Packages</i> are available and (2) <i>Current Intelligence</i> is available, execute <i>Node Mission Package</i>	Component Command
11-3	If (1) <i>Node Mission Package</i> successful and (2) <i>Mission Feedback</i> available, then annotate <i>Node Mission Package</i> as "completed" → go to Step 11-5	Component Command
11-4	Otherwise, re-nominate <i>Node Mission Package</i> to JTF Headquarters	Component Command
11-5	Provide <i>Mission Effects Report</i> to Effects Assessment Cell (Task 10)	Component Command
<i>End of Node Mission Package loop</i> - - - - -		
Task Output	<i>Mission Effects Report</i> and re-nominated <i>Node Mission Packages</i>	

Note: This task sequence is repeated separately for JFACC, JFLCC, JFMCC, JSOTF, and JIACG

Figure 22 Tactical Execution Cycle (Task 11)

The participants listed for each task in Figures 12-22 are drawn from specifically identified communities of interest defined within the JTF command system. Each community of interest—defined by Joint doctrine as a specific board, group, working group, or cell—is considered to be responsible for generating the knowledge elements that comprise the output of a specific planning task. Thus, the composition of these boards, groups, and cells determines the type (areas and levels) of staff actor expertise that is applied at each stage in the JTF planning process. The nominal composition of each board, group, working group, and cell was determined from a review of the Joint and Service force development and doctrinal literature referenced earlier. Again, it must be stated that the exact composition of these various boards and groups are subject to future definition by JTF Commanders. However, for the purposes of this project, they were assumed to be comprised of the specific staff actors and experts depicted in Figure 23.

Listed for each community of interest are both primary and supporting participants. Following the logic reflected in the modeling of each knowledge creation task, the task is initially undertaken by the set of primary participants. As illustrated in Figure 24, the knowledge creation task is executed (1st iteration) using the collaboration strategies and obstacle factors outlined earlier. At this point, the model logic assumes that the JTF Commander (or his designated Knowledge Management Officer) would review the progress of the task in terms of the extent of knowledge elements “recognized” by the set of primary participants. If it is determined that significant gaps exist within the task’s knowledge product, then the collaboration process is repeated a second time (2nd iteration) with the supporting participants added to the process. By adding the supporting participants, the model logic assumes that re-execution of the knowledge creation task will benefit from additional areas or levels of expertise. Computationally, this test involves comparing the percentage of “missing” knowledge elements (compared to the “ideal world” scenario) against a threshold value specified as user input to the model. Currently, the

user can set this value anywhere in the range 5-40%, with lower values demanding a more aggressive knowledge creation policy.

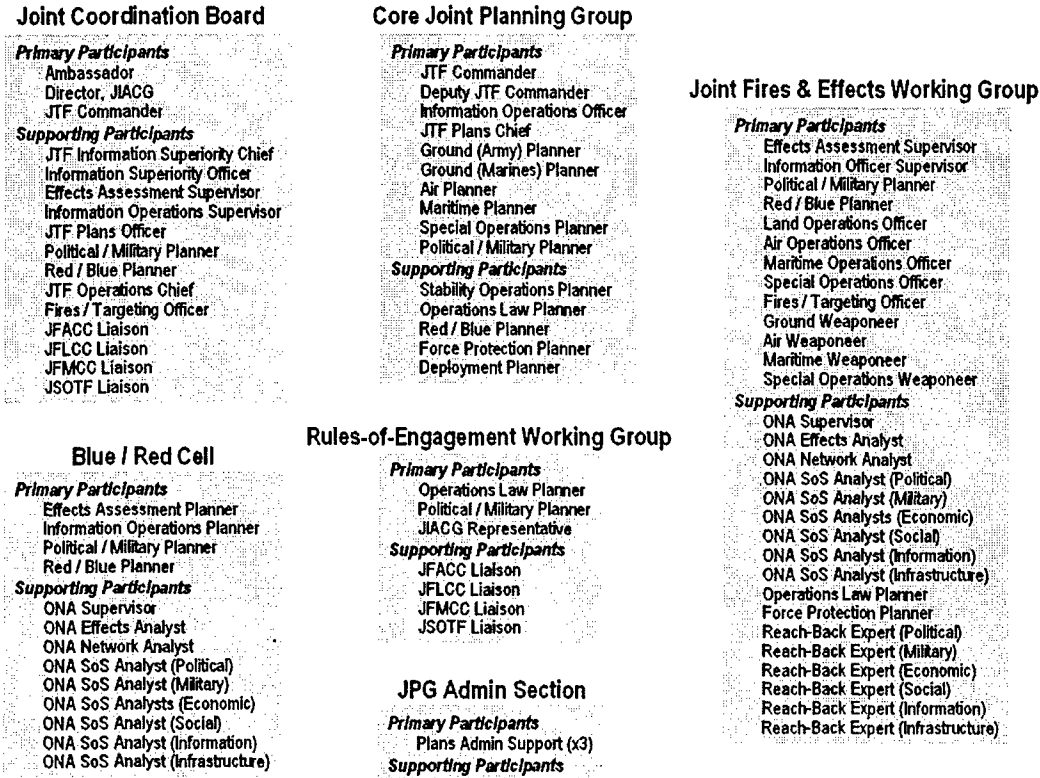


Figure 23 Composition of Boards, Groups, Working Groups, and Cells Reflected in the Model Architecture

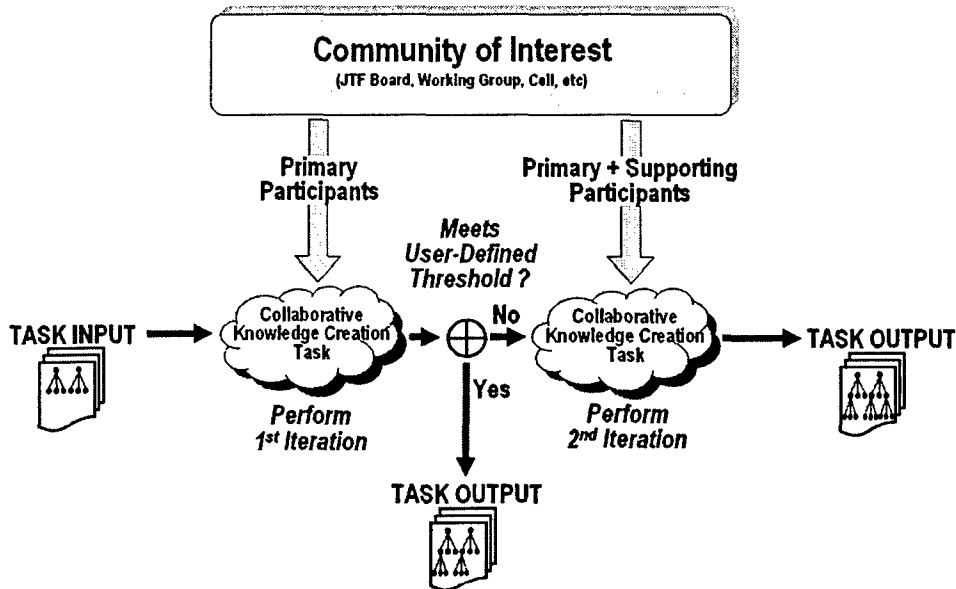


Figure 24 Knowledge Threshold Management Process

THE ANALYSIS OF SENSEMAKING AND KNOWLEDGE MANAGEMENT AS A SYSTEM OF SYSTEMS PROBLEM

As noted earlier, the modeling of sensemaking and knowledge management within a JTF command system is best approached as a system-of-systems problem. Specifically, these processes involve cognitive systems, operational systems, social systems, and organizational systems—all working toward the common objective of translating high level command intent into a detailed set of action directives. The preceding section of this report has outlined the key elements of each of these systems as they are represented in the simulation model that emerged from this project. Addressed next is the matter of how these modeling features can be employed to study the sensemaking and knowledge management performance of a JTF command system.

A System of Systems Model

As shown in Figure 25, an organization such as a JTF command system can be viewed as a system of systems model—with each component system interacting with and exerting influence upon the other systems. Within the cognitive system, individual staff actors within the JTF command system engage in the framing of available information within their personal experience and expertise to form actionable knowledge. Specifically, this knowledge is defined by the specific mental association linkages that are formed between the various levels of the JTF problem space (see Figure 4). The individual actors include those specific staff members within the JTF command system that participate in the joint planning process (see Figure 23).

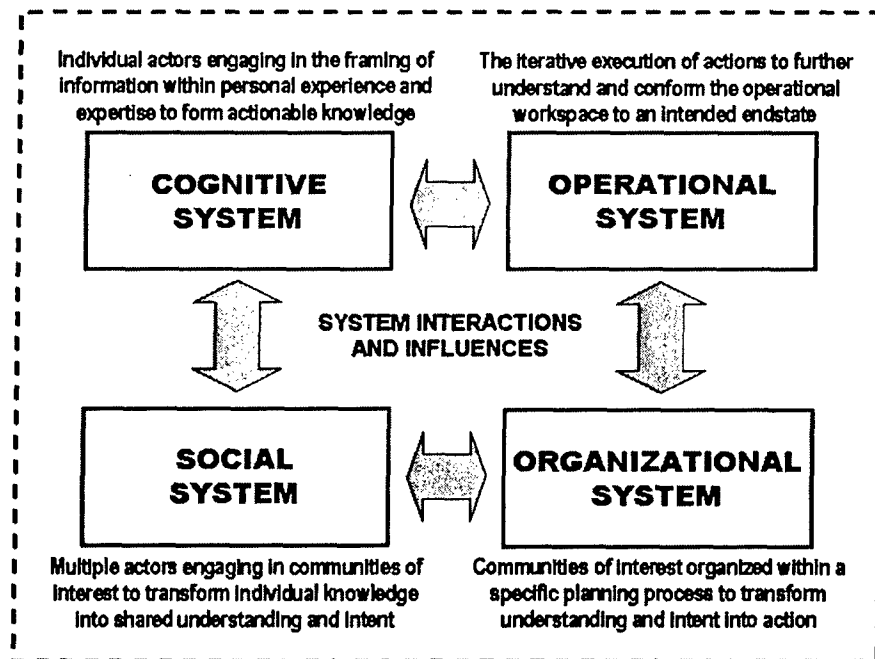


Figure 25 System of Systems Model

Within the social system, designated sets of actors engage in communities of interest to transform individual knowledge into shared understanding and intent. Specifically, these communities of interest correspond to the various boards, groups, working groups, and cells defined within the JTF command system (see Figure 23). The relative availability and contribution of specific actors depend upon the current workload and the set of collaboration

obstacles affecting each actor (see Figures 9 and 10). The manner in which individual knowledge is integrated within each community of interest is determined by the mode of collaboration established for that community (see Figure 7).

Within the organizational system, communities of interest are task organized within a specific planning process or planning rhythm to transform shared understanding and intent into a set of action directives. Specifically, the operational planning rhythm consists of a sequence of collaborative knowledge building tasks that decompose high level command intent into desired endstates, centers of gravity, supporting PMESII functions, and battlespace node mission packages (see Figure 11). The resulting knowledge space is reflected in the form of an ETO that specifies the operational missions to be executed by each component command within the JTF command system.

Within the operational system, the directed missions specified in the ETO are carried out over a number of daily execution cycles, with the total number of cycles determined by the mission requirements and the availability of mission resources. Collectively, the set of missions serves to conform the battlespace to a set of desired endstates. At the same time, these missions provide feedback regarding the state of the battlespace—thus providing the JTF command system with the ability to adjust its understanding and redirect missions as time goes on.

Modeling Representation and Measures of Performance

Depicted in Figure 26 is the level of progress achieved during *Project Gnosis* regarding the representation of this system of systems model in terms of working simulation software. Three of the component systems—cognitive, social, and organization—are shown as completely represented, at least in terms of first-order effects and linkages. The operational system is shown as partially represented since the original scope of *Project Gnosis* precluded the detailed modeling of combat and other actions within the battlespace.

Figure 26 also illustrates the types of model inputs over which the analyst has control. Specification of these inputs allows the model analyst to configure the JTF command system in various ways—thus allowing the capability to examine a range of personnel, technological, organizational, and process issues associated with the design and functioning of a future JTF command system.

Cognitive System Representation First-order representation of the cognitive system includes the detailed specification of individual actor knowledge in terms of the Leontief input-output matrices that specify their likelihood of associating knowledge elements across the decomposition of the JTF problem space. By adjusting these matrix values, the model analyst can specify the areas and levels of PMESII expertise characterizing each specific actor defined within the JTF command system. In turn, these matrix values are stochastically used by the various knowledge creation tasks in the model to determine whether specific knowledge elements of the overall JTF problem space are “recognized” during a given execution run of the simulation model. The model analyst controls the degree of process variability or randomness by specifying the standard deviation of the normal distribution function used in this stochastic process. Finally, the model analyst can specify the available time allowed for this cognitive recognition process—*i.e.*, deliberate versus expedient—by adjusting the recognition threshold value used in this stochastic process.

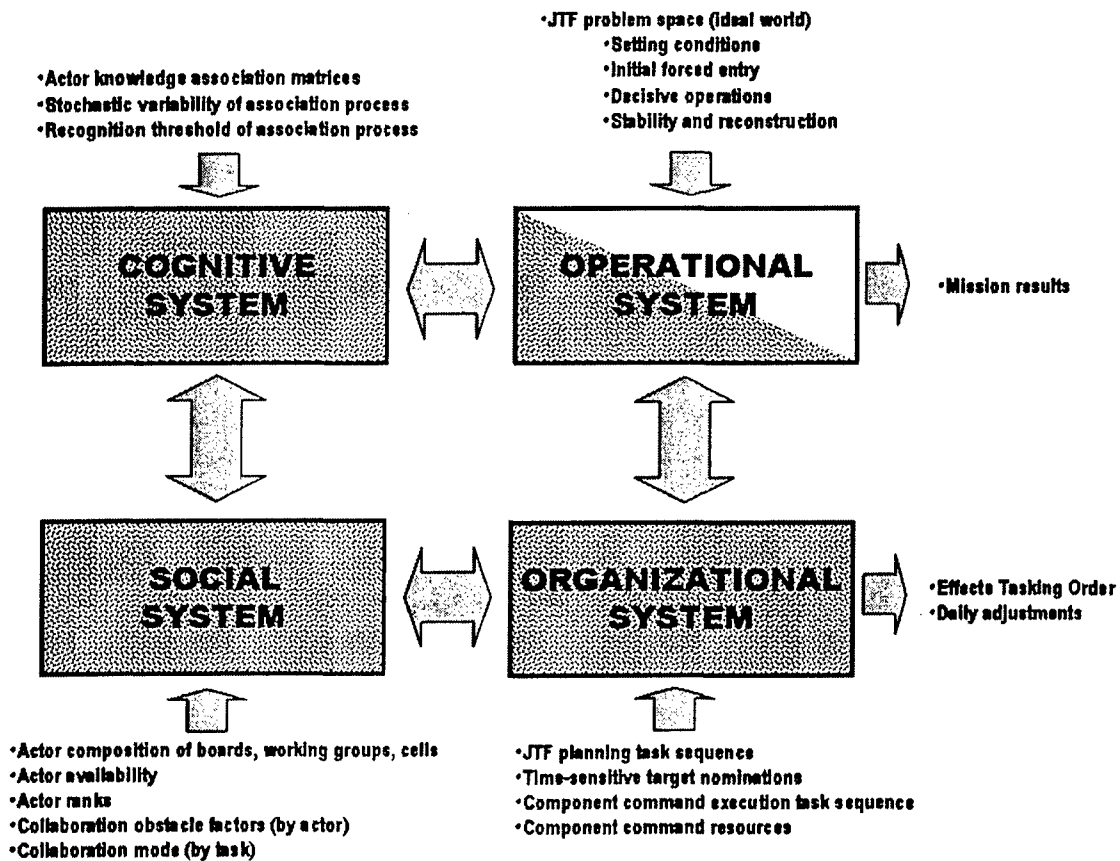


Figure 26 System of Systems Model Representation in Project Gnosis

Social System Representation First-order representation of the social system includes the detailed specification of which actors contribute their individual knowledge to each knowledge creation task defined within the overall JTF planning process. The assignment of actors to specific steps in the planning process is based on a nominal definition and composition of the various boards, working groups, and cells defined within the JTF command system. The nominal definition and composition of planning boards, working groups, and calls is based on a review of Joint and Service literature available at the time of this project. In some cases, the project discovered inconsistencies across this literature regarding the location and composition of these communities of interest. Reconciling these inconsistencies remains the responsibility of the Joint and Service commands. For the purpose of this project, it was assumed that both Joint and Service personnel would collaboratively contribute to the JTF planning process and that this process would be integrated across a networked command system.

For modeling purposes, it was assumed that certain actors would be designated as “primary” while other actors would be designated as “supporting.” Each knowledge creation task is initially executed with only primary actors. Task output is then compared in the model against the “ideal plan” based on perfect PMESII knowledge. If the level of “missing knowledge elements” exceeds a certain threshold (specified by the model analyst), the task is re-executed with both primary and supporting actors. By adjusting the threshold value, the model analyst can account for different management oversight policies—e.g., deliberate versus expedient—within the JTF

planning process. Actor availability is determined as a function of current workload and scheduled availability of each actor (analyst input). In addition, the model analyst specifies the actor rank and a set of six collaboration obstacle factors for each actor. Specification of these social process variables determines the relative ability of each actor to effectively contribute their individual knowledge in a given planning task. Finally, the model analyst can specify through the type of collaboration process defined for each knowledge creation task—authoritative, inclusive, democratic, or hybrid. The mode of collaboration, together with actor rank and the set of collaboration obstacle factors, determines the manner in which individual knowledge is combined to produce group consensus knowledge in each planning task.

Organizational System Representation First-order representation of the organizational system includes the detailed definition and sequencing of the specific knowledge creation and vetting tasks defined within the JTF planning process. The nature and sequence of these tasks are specified in the model design architecture and are not subject to modification by the model analyst. The nominal definition of the task sequence comprising the JTF planning process is based on a review of Joint and Service literature available at the time of this project. In some cases, the project discovered redundant knowledge creation tasks across the different Joint and Service headquarters described in this body of literature—*i.e.*, the same tasks were described as being performed at both a JTF headquarters and a component command headquarters. Reconciling these redundancies remains the responsibility of the Joint and Service commands. For the purpose of this project, it was assumed that a single planning process would be executed with each headquarters contributing across a networked command system. This planning process serves to produce the baseline ETO that is passed down to the component commands for execution. The ETO contains a prioritized set of node mission packages that are assigned—by node mission type—to each component command.⁴ In effect, this node mission package list represents the Joint Prioritized Target List (JPTL) that would be produced by the JTF command system.

Execution of the JPTL is governed by the component command task sequences that are incorporated into the model architecture. These tasks are not subject to modification by the analyst. The number of execution cycles required to accomplish the prioritized set of node mission packages reflected in the JPTL depends upon two additional model inputs. The first of these model inputs consists of the engagement resources allotted daily to each component command (specified by the model analyst). The execution task sequence assigns resources according to node mission package type and priority. Typically, several execution cycles will be required to fulfill the entire set of node mission package nominations included in the JPTL. Mission outcomes are stochastically determined (modeled only at the level of mission success or failure), based on the likelihood of available intelligence and weaponing effects (model input). Unsuccessful missions are re-nominated and placed back on the JPTL for consideration in future execution cycles. This process continues until either (1) all node mission package nominations have been successfully executed or (2) the component commands have exhausted their engagement resources. The second type of model input reflects the time-sensitive target (TST) nominations assumed to be generated by a TST Cell within the JTF command system (not represented in detail in the mode architecture). These targets are represented as high priority

⁴ The component commands reflected in the model architecture include the Joint Force Air Component Command, the Joint Force Land Component Command, the Joint Force Maritime Component Command, the Joint Special Operations Task Force, and the Joint Interagency Coordination Group.

node mission packages that divert engagement resources away from other preplanned missions during a given execution cycle.

Operational System Representation First-order representation of the operational system includes the specification of the JTF problem space in terms of National Command Authority objectives, desired strategic endstates, centers of gravity, supporting PMESII functions, and node mission packages ideally associated with an operational campaign. For this project, the problem space was depicted as a four-phase operational scenario that included (1) setting conditions, (2) initial forced entry, (3) decisive operations, and (4) stability and reconstruction. The elements comprising this problem space are notional, but considered representative of the breadth of elements addressed in recent operational campaigns such as Operation Iraqi Freedom. Within the overall model architecture, definition of the JTF problem space provides the structural template for building the knowledge association matrices associated with each simulated actor. That is, the cells within the staff actor knowledge matrices uniquely correspond to the relationships perceived to exist between specific knowledge elements at each level of the JTF problem space. As noted earlier, this structure is considered from an "ideal world" perspective, whereas the cell values specified by the model analyst in each matrix reflect the imperfect knowledge of the actors.

The present model architecture allows for the modification of this scenario (*i.e.*, the addition or deletion of specific knowledge elements); however, the model analyst must take considerable care to insure that any changes are consistently reflected in the knowledge matrices defined for each actor. Since modifying the knowledge matrix templates can be a tedious undertaking (and one that requires a good understanding of the model's software architecture), it is likely that the model analyst will chose to employ a fixed scenario over the course of an analytic investigation.

In terms of executing the ETO, the resulting JPTL produced by the simulated JTF command system corresponds to the structure defined in the JTF problem space. Based on the various factors influencing the organization's ability to bring appropriate staff expertise to bear in the planning process, the JPTL will likely only partially address this problem space. That is, the imperfect knowledge of specific actors will combine with the host of collaboration obstacles and other factors to create gaps and errors in the shared understanding and intent created by the simulated planning process. Gaps will be reflected in the failure of the JPTL to identify specific node mission packages for execution. Errors will be reflected in the inadvertent inclusion of restricted nodes in the JPTL. Together, measurement of these gaps and errors (with respect to the "ideal world" campaign plan designed by the model analyst in the construction of the JTF problem space) will provide the basic means for assessing JTF command system performance.

Limitations of the Operational System Representation As noted earlier, *Project Gnosis* did not address complete representation of the operational system. While the model architecture provides for the basic execution of an ETO by component commands, there are a number of acknowledged shortcomings in the present simulation model. The present modeling project was envisioned as a proof-of-principle research effort designed to show how actionable knowledge is collaboratively constructed within an organization involving scores of experts each holding unique areas of knowledge, a specific sequence of planning tasks that combines these actors within an overall planning rhythm, and a specific set of collaboration obstacles that influence the performance of this planning rhythm. Many other aspects of sensemaking remain to be addressed

in terms of how they might be effectively represented in an analytic model. Summarized below are the major areas of limitation identified during *Project Gnosis*:

- The actual state of the battlespace is not explicitly represented in the present simulation model. Rather, the model keeps track of only successful and unsuccessful mission executions. Successful mission executions are presumed to produce an intended effect on specific battlespace nodes, whereas improperly vetted missions are presumed to produce various types of unanticipated negative consequences. The details of these operational effects are not explicitly portrayed in the present simulation model. It is envisioned that such detail might be handled in a separate combat simulation model, and that this combat model would be integrated with the present work in a future confederation of interoperable simulation models.
- The process of building situation understanding through the analysis and synthesis of battlespace sensor data and intelligence reports is not explicitly represented in the present simulation model. Such a process would serve to continuously update and refine the JTF problem space as new aspects of the battlespace became better understood. It is also acknowledged that representation of this aspect of sensemaking would focus greater attention on the specific details of information flow within a JTF command system. Rather, the present model is limited by a fixed JTF problem space that is assumed to have been constructed with prior intelligence. It is envisioned that future research might extend the present work to address the process of dynamically updating and refining the staff actors' understanding of the JTF problem space.
- The process of staff learning is not addressed in the present simulation mode. Here, staff learning is considered to be the process by which the individual staff knowledge matrices are updated to reflect participation in the different community of interests defined within the JTF command system. For example, one strategy might be to replace each staff actor's individual knowledge matrices with the group consensus matrices that are constructed during the different planning tasks. Updating individual staff actor matrices in this fashion presumes that the individuals learn from and adopt the group consensus knowledge that is built during the planning process. Staff actors would then benefit from this learning by being able to apply the updated knowledge matrices in future planning tasks. Since the present model architecture does not provide for a series of repeated planning tasks, the issue of staff actor learning is a mute point. It is envisioned that future research might extend the present work to address the mechanisms and implications of such learning.
- There are many other aspects of planning within a JTF command system—*e.g.*, logistics planning, personnel planning, command and control planning, and so forth—that are not addressed in the present simulation model. It is acknowledged that these activities constitute important areas of JTF and Service staff functioning and that they would have a significant impact on overall operational effectiveness. It is further acknowledged that their representation might use many of the same constructs already included in the present model. However, they were considered to be beyond the scope of the present proof-of-principle research.

MODEL SOFTWARE

The resulting model architecture was translated into executable software by Micro Analysis & Design, Inc.⁵ (MA&D), using the *Micro Saint Sharp*® (*MS#*) programming environment. The executable software runs on a desktop PC and a typical model run requires several minutes to complete, depending upon the speed and memory of the PC and various options set within the model input data. To assist the analyst in running the simulation model, a complete User's Guide is provided as a separate document from this technical report. The user guide describes the general software architecture of the simulation model; the graphical user interface for setting input parameters; a summary of the model output reports available to the analyst; a detailed description of the model software objects, variables, functions, events, and knowledge matrices; and a summary of the task network comprising the JTF planning and execution sequence. A brief description of these elements is presented below.

General Software Architecture

While the software was developed within the *MS#* modeling environment, the complexity of the knowledge creation representations required the development of a customized plug-in—or Dynamically Linked Library (dll)—that contained a number of customized data structures, algorithms, and user interface options. This GNOSIS.dll is loaded prior to model execution and enables the user to easily access and modify those input parameters commonly adjusted between model runs. Other model input data—e.g., scenario data describing the JTF problem space—is entered via *MS#* scenario events. Two files are necessary to maintain and run the model: the GNOSIS.dll file just discussed and the *MS#* model file. The *MS#* model file can be saved by the analyst to preserve specific changes in the input data for future runs. Modeling convention suggests that these saved files should be uniquely labeled using the following type of naming format: “GNOSIS_modeldate_Master.saint”, where *modeldate* is the date on which the changes were created by the analyst. As a precaution, the GNOSIS.dll plug-in allows the analyst to restore the model input parameters to their original default state defined within the current project.

Graphical User Interface

A customized graphical user interface (GUI) is provided to facilitate modification of the more commonly varied input parameters. These parameters appear to the analyst in tree view form, as illustrated in Figure 27. Each of the tree branches can be expanded to allow access to five subdirectories of input parameters:

- *Working Groups* This includes the assignment of specific staff actors to each of the defined communities of interest (working groups) within the simulated JTF command system.
- *Actors* This includes the specification of staff actor attributes that include staff actor rank, the unique collaboration obstacle factors for each actor, and the definition of the knowledge matrices for each actor.

⁵ Just prior to the completion of *Project Gnosis*, Micro Analysis & Design was incorporated as an operating division of Alion Science & Technology Corporation.

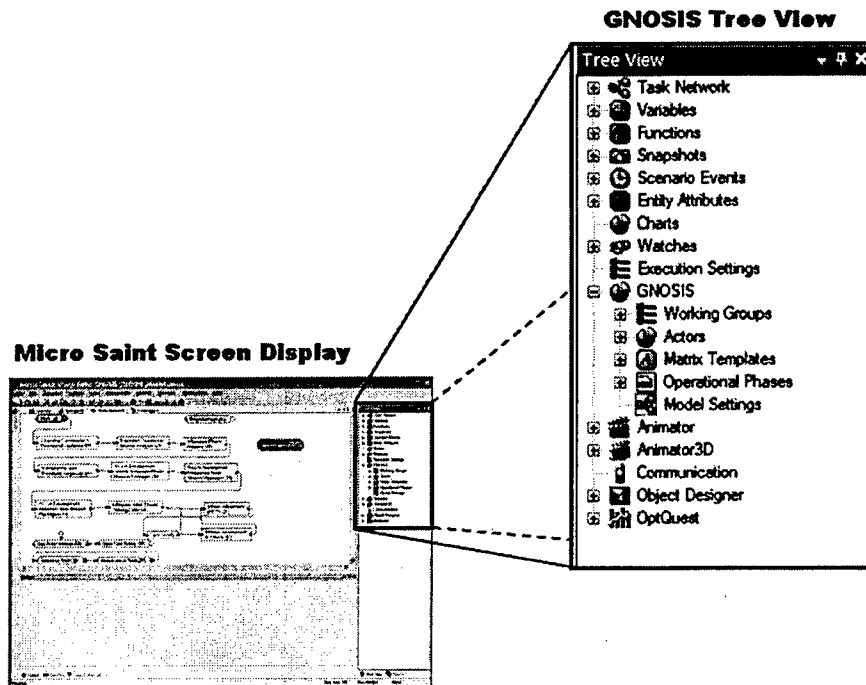


Figure 27 GNOSIS Tree View of Input Parameters

- *Knowledge Matrix Templates* This includes the specification of the knowledge matrix indices used for defining the actor knowledge matrices.⁶
- *Scenario Phases* This includes the specification of the tree structure of knowledge elements defining the JTF problem space that extends from the high level NCA Objectives down through the low level Node Mission Packages.⁷ The current scenario configuration includes four phases: (1) setting conditions, (2) initial forced entry, (3) decisive operations, and (4) stability and reconstruction.
- *Model Settings* This includes a variety of miscellaneous settings required for each model run, including the *Knowledge Threshold* (sets the “detection” threshold used with the knowledge matrices), *Knowledge Collaboration Variability* (sets the standard deviation of the normal distribution function used to generate specific instances of the knowledge matrices), *Knowledge Threshold Gap* (required percentage of knowledge elements to be identified, below which the model triggers a second execution of a knowledge creation task), *Task Time Factor* (value used to set task completion time), *Phases to Execute* (specifies which phases of the operational scenario to include in a given model run), *Use Perfect Knowledge* (sets all knowledge matrix values to 1.0 for a given model run), and *Run Tactical* (specifies whether or not to include the Tactical Execution portion of the model in a given model run).

⁶ The analyst is cautioned against making changes to the knowledge templates unless they possess a detailed understanding of how these templates affect the construction and use of the staff actor knowledge matrices in the model.

⁷ The analyst is cautioned against making changes to the knowledge element tree structure unless they possess a detailed understanding of how this tree structure shapes other required model input.

Model Output Reports

The model provides three types of output that may be specified by the analyst. During model execution, the MS# modeling environment provides for a string of *Print Outputs* that are written to describe the state of specific constructs and the output of specific tasks as they are performed. This output listing can be quite long, can significantly slow model execution speed, and is typically used for diagnostic and debugging purposes. The analyst has the option of turning off much of this output. A more useful form of output report is the set of specific *Snapshots* that can be generated and stored in a file for later export (e.g., to MS Excel©) and analysis. These snapshots capture and summarize important data for each knowledge creation task, the operational value computation tasks, and the Node Mission Package execution results in a given model run. A list of snapshot report types available to the analyst are summarized in the User's Guide. They address such details as actor participation, knowledge element recognition and prioritization within the produced ETO, the progress of executing the ETO, sortie resource allocations, and various other details that allow the analyst to investigate the impact of various cognitive and social factors on JTF command system performance. More importantly, the analyst can specify for each model run which of the snapshot reports to produce –thus providing both analytic flexibility and the ability to control model execution time. A third type of model output is reflected in the knowledge animation displays that can be viewed during model execution. This type of plug-in allows the analyst to expand the JTF problem space tree structure and track the status of various knowledge elements during model execution. Circular icons adjacent to each knowledge element in the tree structure will change status color as they are either unprocessed (blue), recognized by the staff actors (green), overlooked by the staff actors (red), and/or restricted on the basis of rules of engagement (yellow). Such a display provides a visual indication of the knowledge creation patterns within the JTF planning rhythm as it unfolds.

GNOSIS Model Objects, Variables, Functions, Events, and Knowledge Matrices

The MS# modeling environment facilitated construction of the simulation model in terms of the latest state-of-art object-oriented programming techniques. In addition to the GNOSIS.dll plug-in described above, the resulting software code incorporates a variety of data constructs and algorithms that are described in detail in the User's Guide. These features include

- *Model Objects* – custom-designed software objects (groupings of related data) that can be treated as variables throughout the simulation model,
- *Model Variables* – various types of strings, hash tables, Boolean tables, and arrays that represent different types of constructs within the simulation model,
- *Model Functions* – various types of customized algorithms that perform different computational operations on the defined variables throughout the simulation model,
- *Entity Attributes* – sets of defined attributes that are used to track the dynamic status of missions, actors, and other entities represented in the simulation model,
- *Scenario Events* – a set of called functions used to initialize model variables at the beginning of each run, and

- *Knowledge Matrices* – specifically defined arrays used in the simulation model to either (1) represent the associational knowledge of individual staff actors or (2) globally represent the state of knowledge construction at different stages in the JTF planning process.

The simulation model keeps track of thousands of data elements during the course of a single model run. In terms of computational complexity, it is the most complex model yet constructed in the MS# programming environment.⁸

Micro Saint Sharp Task Network

The MS# programming environment was selected for use in Project Gnosis because it provides a state-of-art capability for building task-based process simulation models. Using this modeling environment, software engineers from MA&D translated the model architecture designed by EBR into a *Micro Saint* task network. This task network can be viewed during model execution through a series of hyperlinked network graphs. The top-level network diagram is depicted in Figure 28.

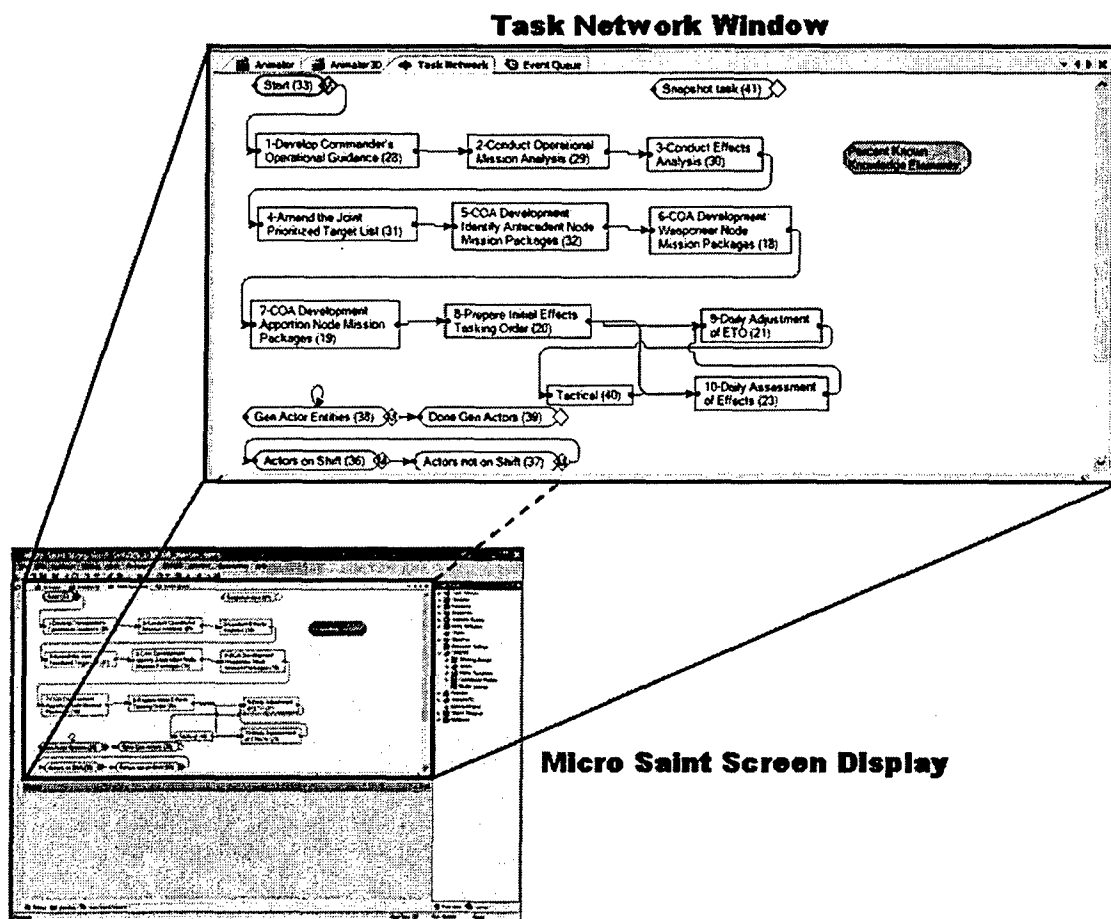


Figure 28 Micro Saint Task Network

By double clicking the mouse cursor on a specific task box, the analyst can open a new window that expands a detailed view of the steps and procedures contained in the selected task. By

⁸ Based on programmer comments provided by Micro Analysis & Design.

successively doubling clicking on these displays, the analyst can drill down to the actual software code underlying the task network. This potentially allows the analyst to edit any portion of the *Micro Saint* task network; however, it is strongly cautioned that changes to the model software code should be undertaken only by someone deeply familiar with the model architecture.

EMPLOYING THE MODEL AS AN ANALYTIC TOOL

Having described the conceptual design and software implementation of the JTF command system simulation model, the final section of this report discusses the use of this model for investigating various types of systems engineering issues. The first part of this section presents an overview of the types of analytic strategies that might be employed with the model. This is followed by a brief illustration of the type of parametric model runs that can be made with the model. A broad range of parametric investigations can be undertaken with the model, depending upon the specific types of issues being studied and the imagination and creativity of the analyst. The examples illustrated in this section reflect only a small sampling of what is potentially possible.

ANALYTIC STRATEGIES FOR USING THE MODEL

Models such as the one developed in this project are a means of investigating certain issues rather than an end unto themselves. Consequently, it is important to consider use of the model in the broader context of an overall investigational strategy. For the study of knowledge creation and management within an organization such as a JTF command system, this context potentially addresses multiple levels and dimensions of systems analysis. A general depiction of these levels and dimensions is illustrated in Figure 29.

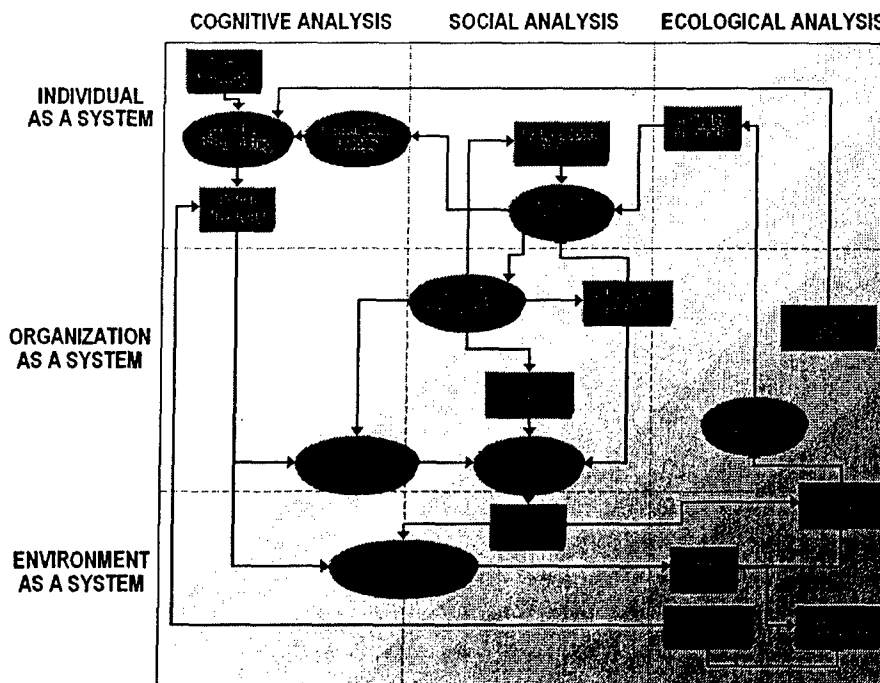


Figure 29 Levels and Dimensions of Analysis

As seen in this figure, the complexity of the knowledge creation and management process within an organization provides the analyst with any number of areas within which to focus an investigation. Each of these areas reflects different opportunities for system intervention and performance improvement. The range of system interventions potentially of interest to the analyst is depicted in Figure 30.

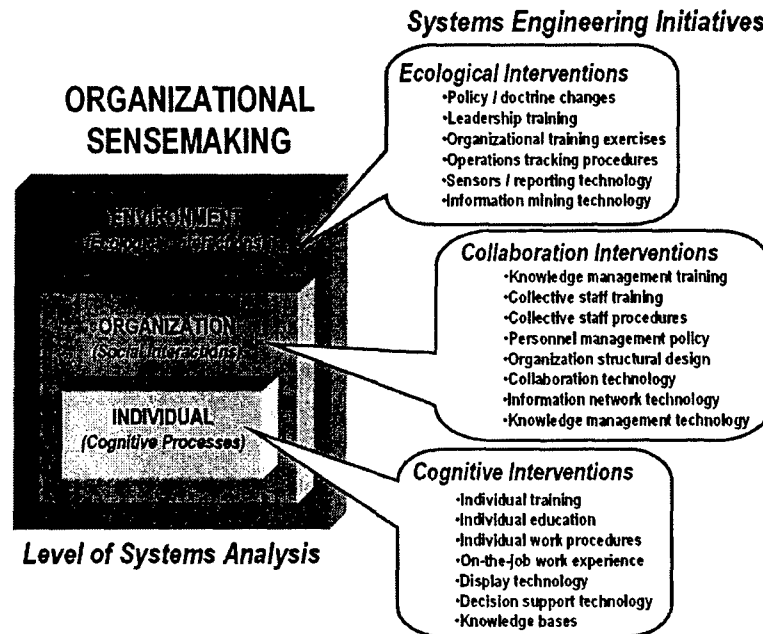


Figure 30 Types of System Interventions

Depending upon the nature of the systems intervention envisioned—e.g., information technology, personnel training, process reengineering—the analyst will likely center his attention on a particular system level and dimension of analysis. At the same time, the analyst must properly consider the broader context of how this process operates across other levels and dimensions. These two competing factors—the need to focus on a limited set of intervention variables while accounting for a host of other variables—reflects the motivation for *Project Gnosis*. That is, the project was undertaken with the desire to address—at a first-order level of detail—a broad range cognitive, social, organizational, technological, and ecological variables and processes within the confines of a unified analysis. At the same time, it was acknowledged that the analyst would likely be interested in examining the effects of only a limited number of the variables at any given time.

A Simple Process Paradigm and a Myriad of Complex Interactions

The basic paradigm reflected in the current model is this: actionable knowledge is created by bringing together both expertise and situational awareness in a purposeful and systematic manner. Here, expertise is reflected in the specification of staff actor knowledge. Awareness is reflected (to a degree) in the specification of the knowledge element hierarchy structure. The manner in which these two elements are brought together in a purposeful and systematic manner is reflected in the modeling of the planning task sequence and the modeling of staff actor collaboration. Beyond this simple description, everything else is just a matter of detail. Yet, while the model reflects a fairly simple process paradigm, the level of detail specified in the model provides for the dynamic interaction of thousands of data elements. Thus, from a modest

paradigm comes the potential for enormous complexity –so much complexity that the analyst will find it difficult to keep track of all of these interactions and their influence on overall system performance. Thus, a few words of caution are in order.

- Many different variables can affect a specific aspect of performance. For example, lowering a specific staff actor's level of expertise (*i.e.*, reducing the actor's association probability values within a specific knowledge matrix) might or might not result in fewer knowledge elements being recognized in a given model run. Factors that could actually increase the recognition of knowledge elements include (1) other actors possessing equal or higher association probabilities for the same knowledge elements, (2) the use of supporting staff actors in a given knowledge creation task when the quality of the overall product drops below a specified threshold, and (3) the failure of staff to earlier recognize a root branch within the overall knowledge space that corresponds to the specific staff actor's area of expertise –thus negating his contribution altogether.
- Processes reflected in the model can combine in complex ways. For example, lowering one of the collaboration obstacle factors for a specific actor might or might not result in fewer knowledge elements being recognized in a given model run. One situation that could actually increase the recognition of knowledge elements includes specifying a democratic collaboration model that uses the numerical average of all participating actors –hence, when an actor with medium or low knowledge is removed, other actors with higher knowledge are afforded more influence. Another situation might involve the retriggering of a knowledge creation task with additional supporting actors when the removal of a primary actor lowers the quality of the knowledge product below a specified threshold.
- Stochastic processes within the model can produce performance variability. Thus, when the model is specified to run with non-zero standard deviation values, the analyst will need to assess performance on the basis of statistically analyzing multiple runs.

The complexity of the model represents a challenge for the analyst, requiring careful attention to the construction of input data to insure that intended input changes and performance effects are isolated and not confounded by other aspects of the model. While this can be frustrating for those who do not possess an intimate and detailed understanding of the model architecture, such complexity is nevertheless a reflection of cognition and social interactions in the real world. At its heart, the study of knowledge creation and management on the scale of an entire organization is a complex and tedious undertaking.

Analytic Avenues

To help analysts in employing this model, the following guidance has been developed regarding the organization and specification of input data. This guidance reflects a number of “analytic avenues” that describe how different types of systems engineering issues might be addressed parametrically through different aspects of model input. This guidance is illustrated in Figure 31.

SYSTEMS ENGINEERING ISSUE	AREA(S) OF THE MODEL INPUT TO PARAMETRICALLY CHANGE	EXPECTED MODEL BEHAVIORS
Influence of staff training and experience in a specific PMESII area	<ul style="list-style-type: none"> • Staff actor knowledge association matrix cell values • Staff actor cognitive capacity value 	<ul style="list-style-type: none"> • Higher cell values increase problem space recognition performance • Lower values reduce likelihood of staff actor participation / contribution
Influence of staff rotation frequency	<ul style="list-style-type: none"> • Staff actor trust and/or social currency values 	<ul style="list-style-type: none"> • Lower values reduce likelihood of staff actor participation / contribution
Influence of deliberate versus expedient planning cycle	<ul style="list-style-type: none"> • Knowledge recognition threshold setting • Task completion time 	<ul style="list-style-type: none"> • Lower threshold increases problem space recognition performance
Value of adding knowledge management oversight	<ul style="list-style-type: none"> • Knowledge threshold gap setting 	<ul style="list-style-type: none"> • Smaller gap increases likelihood that task is re-executed with supporting actors
Influence of network connectivity	<ul style="list-style-type: none"> • Staff actor connectivity value 	<ul style="list-style-type: none"> • Lower values reduce likelihood of staff actor participation / contribution
Influence of collaboration tools	<ul style="list-style-type: none"> • Staff actor expressive power value 	<ul style="list-style-type: none"> • Lower values reduce likelihood of staff actor participation / contribution
Impact of varying composition of board, working group, or cell	<ul style="list-style-type: none"> • Staff actor availability 	<ul style="list-style-type: none"> • Lower availability reduces likelihood staff actor is available for task
Influence of different collaboration modes	<ul style="list-style-type: none"> • Task collaboration model • Staff actor rank 	<ul style="list-style-type: none"> • Modifies the relative influence of each staff actor's unique knowledge
Variability of collaboration effectiveness	<ul style="list-style-type: none"> • Knowledge collaboration variability setting 	<ul style="list-style-type: none"> • Non-zero standard deviation produces stochastic variability in model results
Variability of staff performance across different phases of operation	<ul style="list-style-type: none"> • Selectively run model with different scenario phases 	<ul style="list-style-type: none"> • Staff actor recognition performance varies across phase according to PMESII knowledge
Execution of Effects Tasking Order	<ul style="list-style-type: none"> • Action resources available to each component command 	<ul style="list-style-type: none"> • Greater availability reduces number of tactical operation cycles needed for ETO execution
Impact of time-sensitive targets	<ul style="list-style-type: none"> • Time-sensitive target list 	<ul style="list-style-type: none"> • TSTs displace previously planned targets

Figure 31 Exploring Different Systems Engineering Issues with the Project Gnosis Model

Given the complexity of the model and the potential for one set of input changes to interact with other changes, the analyst is strongly cautioned to approach each series of model runs in a careful and systematic manner. It is also recommended that any analysis employing this model begin by examining the effects of different changes in an isolated fashion. After the influence of each change on model behavior is understood, then the analyst can proceed to examine multiple changes in combination with one another.

PERSONNEL EXPERIENCE AND STABILITY – ILLUSTRATING REAL WORLD ISSUES

The effective translation of high-level strategic objectives into actionable knowledge in the form of a prioritized node mission package list requires the availability and effective integration of relevant expertise. This expertise must span across the political, military, economic, social, information, and infrastructure dimensions of the battlespace and include the required capabilities for building each knowledge level of the JTF problem space. Several factors can serve to obstruct this process, including the lack of experience with the type of dimensions and elements relevant to the operational campaign and the lack of social acceptance or trust of those possessing the requisite experience.

As noted in a 1999 Special Report by the US Institute for Peace, there is a recognized need for training officers to deal with the specific problem set of peace operations. (Olsen & Davis, 1999) Specifically, this report—based on experience in Bosnia—noted that “*Just-in-time training will*

not always work unless there is the foundation upon which to build. According to General Meigs, the army faces a major challenge: "The army has a wonderful ability to adapt to a crisis, but we have to be better than that and adapt to the environment before the crisis hits, because in the twenty-first century, the crisis may be so different that you will not be able to adapt quickly enough. Just having good soldiers isn't going to cut it." This report concluded that "Greater emphasis must be placed on geopolitical and cultural training for the army's officer corps." In short, it emphasized the need for expertise across each of the PMESII dimensions of the battlespace.

A similar theme was echoed six years later during Operation Iraqi Freedom. In a 2005 memorandum report for the Senate Foreign Relations Committee, General (retired) Barry McCaffrey identified a number of vulnerabilities in the Joint command system overseeing operations in Iraq. (McCaffrey, 2005) Specifically, he noted a continued under-manning and too rapid turnover of State Department inter-agency representation in Iraq. In addition, he cited the lack of continuity of strategic and operational leadership as being problematic. This theme was again repeated in his 2006 academic report to the US Military Academy where he cited the continued problem of marginally qualified and inadequately experienced personnel in the area of interagency planning and support. (McCaffrey, 2006)

Personnel rotation is thought to be another endemic issue in the effective functioning of a Joint command system. As noted in the Phase I report of this research project (Leedom, 2004), the learning curve for personnel assigned within a Joint Task Force headquarters is very steep. Once the skills and knowledge are acquired, however, two factors contribute to the challenge of maintaining them over time: personnel shortages and the lack of Joint training opportunities. Service personnel rotations in some headquarters can be as short as 90 days, thus creating an obstacle to effective social collaboration within and across functional areas in a headquarters planning staff. (Kelly & Andreasen, 2003)

Summarizing these various reports and articles, one concludes that an often overlooked aspect of JTF command system design is personnel experience in the relevant dimensions of the operational campaign and personnel stability which influences the formation of social networks and effective communities of interest. Accordingly, it was decided that this set of issues would provide an appropriate context for illustrating some of the model capabilities developed within *Project Gnosis*.

PARAMETRIC EXAMINATION OF EXPERIENCE AND STABILITY ISSUES

In order to examine the impact of personnel inexperience and social network immaturity on the overall performance of the JTF command system, two sets of parametric runs were identified. In the first set of runs, the overall knowledge level of the senior JTF staff members was parametrically lowered from the values established in the baseline scenario. In a second set of runs, the social currency values of two key political and social knowledge players were varied during the stability and reconstruction phase of the scenario. In each case, the model was used to examine the impact of these types of changes on the quality of the Effects Tasking Order produced by the simulated JTF command system.

Baseline Scenario and Model Input

The baseline scenario and model input considered for these series of parametric model runs is based on a hypothetical four-phase military campaign (introduced earlier in this report and described in detail in Appendix A). Expression of this scenario in terms of an ideal world JTF problem space was developed using experienced operational judgment to establish the representative Strategic Endstates, Centers of Gravity, PMESII Functional Elements, and Node Mission Packages. Likewise, the ideal world linkage of these knowledge elements was based on experienced operational judgment. Given the unclassified nature of the model and database, no attempt was made to calibrate this data with current real-world operations. However, it is believed that the resulting hierarchical set of linked knowledge elements forming the framework of the database reflects face validity.

Similarly, the defined characteristics of the JTF staff actors simulated within the model were developed using experienced operational judgment (Appendix B). In general, staff actor definitions correspond to a notional Joint Task Force Headquarters design that has been supplemented with additional expertise from the subordinate component commands and other reach-back agencies. The particular areas and levels of PMESII knowledge assigned to each staff actor are considered representative of the nominal type of staff officer that might be assigned in such a position. However, within the current project, no attempt was made to empirically calibrate these knowledge estimates with specific individuals. Such an undertaking would be the focus of a separate effort, depending upon the focus and scope of the systems engineering issues being investigated. As with the scenario knowledge elements, it is believed that the baseline staff actor definitions reflect a level of face validity, based on experienced operational judgment.

All of this being said, the reader is cautioned against attaching too much significance to the absolute performance results achieved with each model run –i.e., interpret them as absolute point estimates of performance for some future JTF Command System. Rather, the reader is encouraged to focus attention on the relative comparisons of performance across related sets of model runs. As with most types of modeling efforts, the focus of these illustrations is the investigation of model sensitivity, not its ability to predict future point estimates of real-world performance.

Reduction of Staff Experience Level

In this first set of parametric model runs, the association strength values defined in each of the staff actor knowledge matrices were systematically reduced to 75 percent and 50 percent of their baseline scenario levels. As described earlier, the reduction of these values make it less likely that a staff actor would recognize valid linkages between the various knowledge elements in the JTF problem space, as defined by the ideal world structure reflected in the input scenario. As these staff actors participate in the different knowledge creation tasks, their failure to recognize specific linkages would have the effect of dropping key elements at each level of the knowledge element hierarchy. Thus, as more elements are dropped, the resulting Effects Tasking Order becomes less and less complete. The primary knowledge creation tasks affected by this parametric change include the following:

- Task 1-3 Identify specific Strategic Endstates that reflect each National Command Authority Objective (conducted by the staff actors participating in the Joint Coordination Board)

- Task 1-4 Identify specific Centers of Gravity that must be influenced to achieve each identified Strategic Endstate (conducted by the staff actors participating in the Core Joint Planning Group)
- Task 2-1 Identify the specific PMESII Functional Elements supporting each identified Center of Gravity (conducted by the staff actors participating in the Core Joint Planning Group)

Results of these model runs for each of the scenario phases are shown in Figures 32-35. Illustrated in each of the figures is the top portion of the JTF problem space, depicted in terms of the ideal world knowledge elements that comprise the scenario. These elements are arranged in hierarchical form from left to right, beginning with the National Command Authority Objectives as they are decomposed into the associated Strategic Endstates, Centers of Gravity, and PMESII Functional Elements. By following each chart from left to right, it is possible to trace the specific linkages and recognitions that would be expected to be recognized in an ideal world state. Also depicted in each figure are those Centers of Gravity and PMESII Functional Elements actually recognized by the simulated JTF staff actors across the different parametric cases. [*Note: A gray-shaded box indicates that a particular Center of Gravity or PMESII Functional Element was successfully recognized and included in the Effects Tasking Order, based on the staff actors' knowledge of those specific linkages.*]

A review of each of these figures illustrates the effect of systematically lowering staff actor knowledge –*i.e.*, the association strength values defined in each of the staff actor knowledge matrices were parametrically reduced to 75 percent and 50 percent of their baseline scenario levels. A corresponding reduction in the number of Centers of Gravity and PMESII Functional Elements for each case is also seen across the set of figures. Instances where additional elements are being picked up as staff actor knowledge decreases would appear on the surface to be a counterintuitive result. However, it must be remembered that the model logic allows the analyst to set a threshold limit for each knowledge creation task. When the number of knowledge elements recognized by the primary staff actors drops below this specified threshold for a given task, the model assumes that the task would be re-executed with the addition of supporting staff actors. In some instances, the addition of these supporting staff actors increases the ability of the JTF command system to recognize a greater number of knowledge elements.

Another way to compare these different cases is to compute the “operational score” reflected in the different Effects Tasking Orders –an arbitrarily scaled value used to compare parametric cases, but which has no literal meaning in the real-world. Here, the concept of “operational score” is computed by summing the assigned operational value of each set of recognized Centers of Gravity or PMESII Functional Elements –*i.e.*, a higher score indicates that the simulated set of staff actors were able to successfully identify a more significant fraction of the overall JTF problem space defined in the baseline scenario. At the level of Center of Gravity recognition, the staff actors in the baseline model recognized 90.7 percent of the operational value defined in the ideal world JTF problem space. When staff actor baseline knowledge in the Joint Coordination Board and Core Joint Planning Group was reduced to 75 percent of the baseline value, the simulated staff actors were able to recognize only 55.1 percent of the operational value defined in the ideal world JTF problem space –or 60.8 percent of the baseline performance. Similarly, when staff actor baseline knowledge in the Joint Coordination Board and Core Joint Planning Group was reduced to 50 percent of the baseline value, the simulated staff actors were able to

recognize 53.1 percent of the operational value defined in the ideal world JTF problem space –or 58.5 percent of the baseline performance. As seen from Figures 32-35, further reductions in staff actor knowledge are being partially offset by the model’s logic that triggers the re-execution of certain knowledge creation tasks with secondary actors whenever the overall quality of the simulated knowledge product produced by the primary actors drops below a specified threshold.

NCA Objectives	Strategic Endstates	Centers of Gravity	PMESH Functional Elements			
			Base	0.75	0.5	
Shape Battlespace	Air/Sea Superiority	Adversary Airpower Systems	Fighter/Interceptors			
			Military/Civilian Airfields			
			Airfield Support Facilities			
			EW Radar Networks			
			GCI Radar Networks			
			SAM Control Radars			
		SAM Batteries				
		Adversary Seapower Systems	Naval Combatant Ships			
			Submarines			
			Littoral Patrol Boats			
			Military Seaport Docks			
			Seaport Support Facilities			
	Paramilitary Sea Threat					
	Persistent ISR	Key Areas of Interest	Sea Mine Clearance Areas			
			Regime Leader Residence			
			Political Party Facilities			
			Political C2 Network			
			Regime Financial Network			
			WMD Delivery Systems			
			WMD Stockpiles			
			Red Military Installations			
			Red Staging Areas			
			Red Defensive Positions			
			Red Approach Routes			
			Paramilitary Stockpiles			
			Paramilitary Units			
			Paramilitary Vehicles			
			Terrorist Training Camps			
Border Infiltration Routes						
Insurgency Alignment	Internal Insurgency Forces	Ethnic Populations				
		Refugees/Resettlements				
		Key Geographic Areas				
		Regional Media Outlets				
		Natural Resource Facilities				
		Resource Infrastructure				
Capitulation/Neutrality	Key Admin/Mil Officials	Technical Workers				
		Regional Insurgency Cells				
		Insurgency Leadership				
		Democratic Leadership				
Population Support	Civillian Population	Local Admin Leaders				
		Key Utility Managers				
		Military Leaders				
Initial Deployment	US/Coalition Forces	Religious Leaders				
		Local Tribal Leaders				
		Key Ethnic Populations				
Regional Diplomacy	Host Nation Agreements	Airmobile Assault Forces				
		Amphib Assault Forces				
		Deception Forces				
Regional Diplomacy	Neutrality Agreements	Green Minister of Defense				
		Green Minister of Interior				
		Green Military Cdrs				
		Orange Minister of Defense				
Regional Diplomacy	Neutrality Agreements	Orange Minister of Interior				
		Orange Military Cdrs				

Figure 32 Results of Parametrically Reducing Staff Actor Knowledge - Setting Initial Conditions

NCA Objectives	Strategic Endstates	Centers of Gravity	Base			PMESII Functional Elements	Base		
			0.75	0.5			0.75	0.5	
Conduct Deception Campaign	Fix Adversary Forces	Eastern Surveillance				Long Range Surveillance			
		Eastern Combat Divisions				Tactical Reconnaissance			
		Eastern Advance Routes				Assembly Areas / Def Positions			
Conduct Initial Forced Entry	Air/Sea Superiority	Adversary Airpower Systems				Border Civilian Population			
						Fighter/Interceptors			
						Military/Civilian Airfields			
						Airfield Support Facilities			
						EW Radar Networks			
						GCI Radar Networks			
	Adversary Seapower Systems					SAM Control Radars			
						SAM Batteries			
						Naval Combatant Ships			
						Submarines			
						Littoral Patrol Boats			
						Military Seaport Docks			
	Persistent ISR	Key Areas of Interest				Seaport Support Facilities			
						Paramilitary Sea Threat			
						Sea Mine Clearance Areas			
						Red Military Installations			
						Red Staging Areas			
						Red Defensive Positions			
Eliminate WMD Threat	WMD Stockpiles / Delivery Sys				Red Approach Routes				
					Paramilitary Stockpiles				
					Paramilitary Units				
					Paramilitary Vehicles				
					Terrorist Training Camps				
					Border Infiltration Routes				
Degrade Regime Leadership	Top Regime Leadership				WMD Delivery Systems				
					WMD Stockpiles				
					Regime Leader Residence				
Conduct Amphibious Assault	Western Border Defenses				Political Party Facilities				
					Political C2 Network				
					Regime Financial Network				
	Western Security Forces					Physical Defenses			
						Conscript Military Units			
						West Paramilitary Stockpiles			
Western Paramilitary					West Paramilitary Units				
					West Paramilitary Vehicles				
					Elite Security Units				
Conduct Airmobile Assault	Key Airfield Defenses				South Paramilitary Stockpiles				
					South Paramilitary Units				
					South Paramilitary Vehicles				
Build Insurgency Axis	Southern Paramilitary				Cap Paramilitary Stockpiles				
					Cap Paramilitary Units				
					Cap Paramilitary Vehicles				
Set Conditions for STRO	Key Leader Capitulation	Western/Southern Leaders				Ministry/Parliament Leaders			
						City/Town Mayors			
						City/Town Utility Mgrs			
						Military Commanders			
	Build Population Support	Cultural/Religious Support				Key Religious Leaders			
						Clan/Tribal Leaders			
	Build Humanitarian Base	Key Route Traffic				Key Route Population			
						Humanitarian Stockpiles			
	Protect National Resources	Country Green Staging Areas				Staging Areas			
						Oil / Mine / Agri Facilities			
						Pipelines / Transport Sys			
						Technician / Worker Groups			
					Paramilitary Units				
					Paramilitary Vehicles				
Protect Minority Population	Ethnic Neighborhoods				Paramilitary Units				
					Paramilitary Vehicles				

Figure 33 Results of Parametrically Reducing Staff Actor Knowledge - Initial Forced Entry

NCA Objectives	Strategic Endstates	Centers of Gravity	Base			0.75			0.5			PMESII Functional Elements			Base			0.75			0.5				
Eliminate WMD Capability	WMD Under Positive Control	WMD Stockpiles / Delivery										WMD TELs													
		WMD Labs / Production										WMD Storage / Assembly													
Eliminate Regime Power	Regime Leaders Neutralized	Key Regime Actors										Key Regime Leaders													
	Regime Party Neutralized	Political/Finance Nets										Regime Residences / Bunkers													
		Capital Area Paramilitary										Political Party Facilities													
Neutralize Combat Divisions	Divs Capitulate / Destroyed	Capitulating Divisions										Regime Financial Networks													
			Division Leadership										Paramilitary Cells												
			Division Equipment																						
		Resisting Divisions	Division Troops																						
			Disrupting Paramil Units																						
			Disrupting Paramil Vehicles																						
Secure Natural Resources	Protect National Resources	Resource Infrastructure										Division Leadership													
			Division Equipment										Division Equipment												
			Division Troops										Division troops												
			Oil / Mine / Agri Facilities																						
			Pipelines / Transport Sys																						
Protect / Sustain Civilians	Keep Population in Homes	Key Population Leaders										Technician / Worker Groups													
		Civilian Refuge Traffic										Paramilitary Units													
	Humanitarian Relief	Distribution Relief Areas										Paramilitary Vehicles													
			Relief Supplies																						
			Distribution Sites																						
	Protect Minority Population	Ethnic Neighborhoods										Paramilitary Units													
			Paramilitary Units										Paramilitary Vehicles												
Establish Law and Order	Destroy Terrorist Base	Terrorist Operations										Training Camps													
	Stop Foreign Infiltrators	Foreign Infiltration Cells										Terrorist Bunkers													
	Apprehend Criminals	Criminal Networks										Terrorist Personnel													
Protect Coalition Logistics	Protect Convoys / Assby Areas	Coalition Supply Convoys										Terrorist Personnel													
			Convoy Security										Criminal Personnel												
			Paramilitary Units																						
		Coalition Assembly Areas	Paramilitary Vehicles																						
			Terrorist Cells																						
			Assembly Area Security																						

Figure 34 Results of Parametrically Reducing Staff Actor Knowledge - Decisive Operations

NCA Objectives	Strategic Endstates	Centers of Gravity	Base	0.75	0.5	PMESII Functional Elements	Base	0.75	0.5			
Defeat Violent Spoilers	Isolate / Defeat Spoilers	Neighborhood Intelligence				Ethnic Leader Cooperation						
		Operating Spoiler cells	Media Outlets				Terrorist Leadership					
			Terrorist Colls				Terrorist Weapons Cache					
			Terrorist Support Networks				IED Consequence Mgmt					
			Civil Population Support				Media Outlets					
			Insurgency Attack Sites				Community Leader Dialog					
		Co-opt Nonviolent Spoilers	Restrain Disruption Agents	Ethnic Communication				Media Outlets				
				Spoiler Organizations	Spoiler Org Leadership				Spoiler Org Agents			
					Spoiler Org Followers				Media Outlets			
Major Disruption Sites							Protest Consequence Mgmt					
Civil Population Support							Media Outlets					
Estab Next State Conditions	Civil Law and Order			Civil Administration	Civil Admin Functions				National/Local Elections			
					Media Outlets				Admin Office Security			
					National Police Force				Recruit Police Personnel			
				Public Infrastructure	Electricity / Water / Sewage	Police Training Program				Media Outlets		
		Electric Power Networks						Water / Sewage Treatment				
		Water / Sewage Treatment						Media Outlets				
	Information Networks	Utility Systems Security					Telephone / Internet Grid					
		Broadcast Media Centers					Media Outlets					
		Communications Security					Local School Facilities					
		Public Education					Media Outlets					
		Transportation Networks	Key Bridges					Key Roadways				
			Key Roadways					Key Rail Lines				
	Key Rail Lines						Media Outlets					
	Transport System Security						Hospitals / Clinics					
	Public Health Services		Public Health Systems		Medical Stockpiles				Media Outlets			
					Internal Security Forces	National Military Forces	Key Military Leadership					
		NCO / Enlisted Personnel							Military Training Program			
	Military Equipment						Media Outlets					
	International Support	Economic Development Aid	Key Economic Sectors	Economic Aid Agreements					Econ Development Projects			
				Contractor Protection					Media Outlets			
				PVO/NGO Synchronization	PVO/NGO Organizations	PVO/NGO Projects				PVO/NGO Protection		
				Media Outlets					Media Outlets			

Figure 35 Results of Parametrically Reducing Staff Actor Knowledge - Stability and Reconstruction

In summary, the model results provide insight into the type of performance degradation that might be expected when the operational planning is conducted by a less experienced senior staff.

The fact that the resulting reduction in recognized knowledge elements was not proportional to the parametric reductions in actor association strengths is a reflection of the model's inherent complexity. That is, the model logic allows a secondary set of supporting actors to re-execute the critical knowledge creation tasks when the initial results fall below a specified threshold. The unequal distribution of expertise across the set of actors regarding each area of the scenario (see Appendix B) adds further complexity to this process, producing the specific results seen in Figures 32-35.

Reduction of Staff Actor Social Currency

In the second series of parametric runs, adjustments were made to the knowledge matrices of the various staff actors so as to give the Political-Military (POLMIL) Planner and Stability Operations (STO) Planner uniquely high knowledge of those knowledge elements considered political or social in nature. That is, the POLMIL Planner's knowledge of political elements was set to a very high association value, while all other staff actors were correspondingly set to very low association values. The one exception made in this case definition was with respect to the "Ambassador" staff actor who was given high knowledge of the "PVO/NGO Synchronization" Strategic Endstate. Similarly, The STO Planner's knowledge of social elements was set to a very high association value, while all other staff actors were correspondingly set to very low association values. Then, a series of runs were executed wherein the POLMIL Planner and STO Planner's social currency factor was parametrically varied over the values of 1.0, 0.7 and 0.3. In effect, the lowering of each actor's social currency value would reduce the likelihood that they would be allowed to effectively participate in specific planning tasks. The primary knowledge creation tasks affected by this parametric change include the following:

- Task 1-3 Identify specific Strategic Endstates that reflect each National Command Authority Objective (conducted by the Joint Coordination Board which includes the POLMIL Planner as a supporting member, but does not include the STO Planner)
- Task 1-4 Identify specific Centers of Gravity that must be influenced to achieve each identified Strategic Endstate (conducted by the Core Joint Planning Group, which includes the POLMIL Planner as a primary member and the STO Planner as a supporting member)
- Task 2-1 Identify the specific PMESII Functional Elements supporting each identified Center of Gravity (conducted by the Core Joint Planning Group, which includes the POLMIL Planner as a primary member and the STO Planner as a supporting member)
- Task 3-1 Identify the specific Node Mission Packages that are targeting against each identified PMESII Functional Element (conducted by the Joint Fires and Effects Working Group, which includes the POLMIL Planner as a primary member, but does not include the STO Planner)

Results of these model runs are illustrated in Figure 36, where again the gray-shaded boxes indicate which knowledge elements were recognized as part of the Effects Tasking Order by the simulated set of staff actors. The base case represents the situation where the social currency of the POLMIL Planner and STO Planner was set to 1.0. The next two columns for each level of knowledge element represent the situation where the social currency of the POLMIL Planner and STO Planner was set to 0.7 and 0.3, respectively. For this set of model runs, the analysis looked

only at Phase IV, Stability and Reconstruction, since this was the operational phase where political and social knowledge elements existed in significant numbers.

Examination of these comparative results illustrates the complex nature of the simulation model developed in this project. If one were to simply compare these cases on the basis of total operational value reflected in the overall Node Mission Package list, the reduction of POLMIL Planner and STO Planner social currency from 1.0 down to 0.7 and 0.3 would see only a 2.1 percent and 5.6 percent drop in operational value, respectively.⁹ Such a comparison yields little insight into the truly significant impact of varying this type of collaboration factor for two key staff actors. Rather, one must examine the specific changes brought about in the Effects Tasking Order by this type of factor.

For example, the entire block of knowledge elements falling under the “*Restrain Disruptive Agents*” Strategic Endstate remained unrecognized because neither the POLMIL Planner nor the STO Planner were primary members of the Joint Coordination Board that is responsible for identifying Strategic Endstates. Because all of the other staff actors participating in this task were given low knowledge of this Strategic Endstate, this entire branch of the JTF problem space remained unrecognized. As part of the model input, the POLMIL Planner and STO Planner were given uniquely high knowledge of many of the Centers of Gravity, PMESII Functional Elements, and Node Mission Packages that fall within this branch of the problem space. However, because of the Joint Coordination Board’s failure to recognize the “*Restrain Disruptive Agents*” Strategic Endstate, the POLMIL Planner and STO Planner were not given the opportunity to expand this part of the JTF problem space.

The effect of reducing the social currency of the POLMIL Planner can be specifically seen with regard to the “*PVO/NGO Projects*” PMESII Functional Element and the corresponding “*Project Coordination*” Node Mission Package. As the social currency of this staff actor was lowered to 0.7 and beyond, the actor no longer participated in either the Core Joint Planning Group or the Joint Fires and Effects Working Group. Since other staff actors participating in these knowledge creation tasks did not have high knowledge of these elements, they remained unrecognized in the Effects Tasking Order.

⁹ The ideal world operational value reflected in the set of Node Mission Packages identified for Phase IV of the operational campaign is 1005.86 –a somewhat arbitrarily scaled value that is based on the operational scores assigned to each knowledge element within the JTF problem space, and a number that has meaning only with respect to the baseline reference value. Giving the POLMIL Planner and STO Planner uniquely high political and social knowledge, respectively, yields a recognized operational value score of 817.11 when their social currency is set to a value of 1.0. Lowering this value to 0.7 and 0.3 produces a recognized operational value score of 800.31 and 770.31, respectively. These numbers, in themselves, do not provide much insight into the focused impact of removing these two staff actors from the Effects Tasking Order creation process. Greater insight is achieved by examining the specific areas in which the staff fails to recognize key elements of the JTF problem space.

NCA Objectives	Strategic Endstates	Centers of Gravity			PMESII Functional Elements			Node Mission Packages											
		Base	70%	50%	Base	70%	50%	Base	70%	50%									
Defeat Violent Spoilers	Isolate / Defeat Spoilers				Neighborhood Intelligence			Ethnic Leader Cooperation			Local Community Leader								
								Media Outlets			TV/Radio/Newspaper Office								
								Terrorist Leadership			Terrorist Cell Leader								
								Terrorist Cells			Terrorist Cell								
								Terrorist Weapons Cache			Weapons Cache								
								Terrorist Support Networks			Support Network								
					Insurgency Attack Sites								IED Consequence Mgmt			Medical Injury Site			
													Civil Population Support			Facility Damage Site			
													Media Outlets			Local Neighborhood			
																TV/Radio/Newspaper Office			
Co-opt Nonviolent Spoilers	Restrain Disruption Agents				Ethnic Communication			Community Leader Dialog			Local Community Leader								
								Media Outlets			TV/Radio/Newspaper Office								
								Spoiler Org Leadership			Spoiler Org Leader								
								Spoiler Org Agents			Local Spoiler Org Cell								
								Spoiler Org Followers			Local Neighborhood Areas								
								Media Outlets			TV/Radio/Newspaper Office								
					Major Disruption Sites								Protest Consequence Mgmt			Medical Injury Site			
													Civil Population Support			Facility Damage Site			
													Media Outlets			Local Neighborhood			
																TV/Radio/Newspaper Office			
Estab Next State Conditions	Civil Law and Order				Civil Administration			Civil Admin Functions			Local Admin Office								
								National/Local Elections			Admin Official Vetting								
								Media Outlets			Election Event								
								Admin Office Security			TV/Radio/Newspaper Office								
											Area Security Site								
					National Police Force								Recruit Police Personnel			Recruitment Program			
													Police Training Program			Police Training Facility			
													Media Outlets			Training Program Delivery			
																TV/Radio/Newspaper Office			
	Public Infrastructure	Electricity / Water / Sewage							Electric Power Networks			Electric Power Facility							
									Water / Sewage Treatment			Water / Sewer Facility							
									Media Outlets			TV/Radio/Newspaper Office							
									Utility Systems Security			Area Security Site							
		Information Networks								Telephone / Internet Grid			Communications Facility						
										Broadcast Media Centers			Media Center Facility						
										Media Outlets			TV/Radio/Newspaper Office						
										Communications Security			Area Security Site						
	Public Education								Local School Facilities			School Building							
									Media Outlets			TV/Radio/Newspaper Office							
	Transportation Networks								Key Bridges			Bridge							
									Key Roadways			Roadway							
									Key Rail Lines			Rail Line							
									Media Outlets			TV/Radio/Newspaper Office							
									Transport System Security			Area Security Site							
Public Health Services								Hospitals / Clinics			Hospital or Clinic								
								Medical Stockpiles			Medical Supply Load								
								Media Outlets			TV/Radio/Newspaper Office								
Internal Security Forces								Key Military Leadership			Military Officer Vetting								
								NCO / Enlisted Personnel			NCO / Enlisted Vetting								
								Military Training Program			Military Training Facility								
											Training Program Delivery								
								Military Equipment			Combat Vehicle Group								
								Media Outlets			Soldier Equipment Group								
			TV/Radio/Newspaper Office																
International Support	Economic Development Aid							Economic Aid Agreements			Aid / Monetary Agreement								
								Econ Development Projects			Project Coordination								
								Contractor Protection			Area Security Site								
								Media Outlets			TV/Radio/Newspaper Office								
	PVO/MCO Synchronozation								PVO/NGO Projects			Project Coordination							
									PVO/NGO Protection			Area Security Site							
									Media Outlets			TV/Radio/Newspaper Office							

Figure 36 Results of Parametrically Reducing Social Currency of POLMIL Planner and STO Planner

Similarly, as the social currency of the STO Planner was lowered to 0.3, this staff actor no longer contributed to the Core Joint Planning Group –thus resulting in the “*Civil Population Support*” PMESII Functional Element remaining unrecognized with respect to the “*Insurgency Attack Sites*” Center of Gravity. Because the STO Planner is not a member of the Joint Fires and Effects Working Group, this group was unable to recognize the “*Local Neighborhood*” Node Mission Package associated with the “*Civil Population Support*” PMESII Functional Element for any of the three model runs.

In summary, the second set of model runs illustrate one possible way in which personnel instability of two key staff actors might effect specific parts of the Effects Tasking Order. Unlike the first series of model runs, the effects of changing the social currency of the POLMIL Planner and STO Planner are not widespread across the JTF problem space. That is, they are more isolated and focus along a specific dimension of the operation –e.g., dealing with (1) the effect of insurgency attacks and non-violent spoiler activities on the local civilian population and (2) the coordination of Private Voluntary Organization (PVO) and Non-Government Organization (NGO) activities with military operations. Yet, as demonstrated in recent real-world operations, the failure of a Joint or Coalition command system to effectively deal with these aspects of an operational campaign can prove significant over the long run. Hence, it is important that the subtle effects of personnel instability be thoroughly studied.

SUMMARY

The goal of *Project Gnosis* was the initial proof-of-principle development of a new generation of simulation models that would be capable of analytically addressing multiple facets of the sensemaking and knowledge management process that occurs within a military command and control system. To that end, the present model allows the analyst to examine the impact of various cognitive, social and—to a limited extent—ecological variables on the ability of a JTF command process to produce and execute an Effects Tasking Order. As with a real-world military command and control system operating in a modern PMESII problem space, the simulated planning and execution process reflects the complex interaction of thousands of constructs and processes. Although the underlying logic of the model architecture is relatively straightforward and transparent, our limited experience with this type of simulation model in the present project has revealed its use to be challenging. Various sets of cognitive and social variables and constructs embedded within the model can interact in sometimes surprising ways to either enhance or degrade knowledge creation performance. Yet this is merely a reflection of the same complexity faced by analysts in studying real-world phenomena. Accordingly, great care must be taken in both defining the types of systems engineering issues to be addressed and the manner in which these issues are reflected in the myriad of data input required for each model run.

In this regard, this final section of the report has suggested a number of “analytic avenues” along which the analyst can use the model to address certain types of systems engineering issues. Yet this guidance must be supplemented with the analyst’s experience in running the model – experience that reveals critical model sensitivities and limitations. Thus, caution must be raised against the notion that the model can be employed by the casual user to generate a quick or simple set of parametric analyses. Like with any complex simulation model, the use of this

model requires a committed set of analysts who can dedicate the time and attention needed to become intimately familiar with the model's workings.

The two series of parametric runs illustrated in this final section of the report are but a small sampling of the studies that could be undertaken with the model, depending upon the interests of the analyst. Like any complex simulation model, the present model is an analytic tool, not an answer to a specific systems engineering question. Consequently, the validity and quality of the insight achieved with the use of this model depends entirely upon the skill of the analyst to (1) develop valid input parameters from real-world observations and experience, (2) calibrate these input parameters with the analytic assumptions and algorithms embedded within the software, (3) form the input parameters into a cohesive "case representation" that is consistent with the model architecture, and (4) properly interpret the model output to reflect the type of insight appropriate for addressing a specific systems engineering issue.

Finally, it is acknowledged that the present model is by no means a complete representation of the process by which actionable knowledge is produced by an organization in the real world. Much research remains for the future to explore and refine other aspects of sensemaking and knowledge management. *Project Gnosis* is the beginning of but a very long journey to address the cognitive, social, and ecological dimensions of this process in a systematic and analytic manner. It has, however, demonstrated the feasibility and utility of such an undertaking. To that end, the present research study serves as both a milestone for the present and a direction sign for the future.

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APPENDIX A

SCENARIO DESCRIPTION

SETTING CONDITIONS FOR SUCCESS (PART 1 OF 2)

NCA Index	NCA Objective	SES Index	SES Value	Strategic Endstate	CoG Index	CoG Value	Center of Gravity	FE Index	PMESII Functional Element	Effect Class	Operational Effect	NMP Class Index	% Contrib	Individual NMP Index	Node Mission Package
1	Shape Battlespace	1	80	Air/Sea Superiority	1	20	Adversary Airpower Systems	1	Fighter/Interceptors	1	Destruction	1	100%	1-15	Fighter Aircraft Squadron
								2	Military/Civilian Airfields	2	Neutralized	2	70%	16-21	Military Airfield Runway
								3	Airfield Support Facilities	1	Destruction	4	30%	22-30	Civilian Airfield Runway
								4	EW Radar Networks	1	Destruction	5	100%	31-45	Fuel Storage Facility
								5	GCI Radar Networks	1	Destruction	6	100%	46-48	EW Radar Complex
								6	SAM Control Radars	1	Destruction	7	100%	49	SAM Control Center
								7	SAM Batteries	1	Destruction	8	100%	50-52	SAM Control Radar Site
								8	Naval Combatant Ships	1	Destruction	9	100%	53-61	SAM Launcher Battery
								9	Submarines	1	Destruction	10	100%	62-64	Naval Ship Group
								10	Littoral Patrol Boats	1	Destruction	11	100%	65-69	Submarine
								11	Military Seaport Docks	2	Neutralized	12	100%	70-75	Patrol Boat Group
								12	Seaport Support Facilities	2	Neutralized	13	100%	76-80	Military Dock Complex
								13	Paramilitary Sea Threat	1	Destruction	14	100%	81-85	Sea Support Facility
								14	Sea Mine Clearance Areas	1	Destruction	15	100%	86-90	Paramilitary Boat Group
								15	Regime Leader Residence	8	Monitor	16	100%	91-95	Sea Mine Area
								16	Political Party Facilities	8	Monitor	17	100%	96-103	Regime Residence/Bunker
								17	Political C2 Network	8	Monitor	18	80%	104	Political Party Hqtrs
								18	Regime Financial Network	8	Monitor	19	20%	105-114	Local Party Office
								19	WMD Delivery Systems	8	Monitor	20	70%	115	Political C2 Node
								20	WMD Stockpiles	8	Monitor	21	30%	116	Alternate Pol C2 Node
								21	Red Military Installations	8	Monitor	22	100%	117	National Financial Net
								22	Red Staging Areas	8	Monitor	23	100%	118-122	WMD TEL Battery
								23	Red Defensive Positions	8	Monitor	24	100%	123-127	WMD Storage Facility
								24	Red Approach Routes	8	Monitor	25	100%	128-147	Military Garrison
								25	Paramilitary Stockpiles	8	Monitor	26	100%	148-149	Military Staging Area
								26	Paramilitary Units	8	Monitor	27	100%	150-175	Defensive Fortification
								27	Paramilitary Vehicles	8	Monitor	28	100%	176-177	Key LOC Route
								28	Terrorist Training Camps	8	Monitor	29	100%	178-353	Weapons Cache
								29	Border Infiltration Routes	8	Monitor	30	100%	354-355	Paramilitary Cell
								30	Ethnic Populations	8	Monitor	31	100%	356-357	Paramilitary Vehicle Group
								31	Refugees/Resettlements	8	Monitor	32	100%	358-361	Training Camp Area
				33	100%	362-384	Infiltration Route								
				34	100%	385-402	Ethnic Neighborhood								
					100%	403-411	Refugee Camp								

SETTING CONDITIONS FOR SUCCESS (PART 2 OF 2)

Node Mission Package	# of NMPs	NMP Rate	Prob of Intel Update	Action Class	Primary Action Class	Sorties /NMP	Prob Success	Prob Feedback	Action Class	Secondary Action Class	Sorties /NMP	Prob Success	Prob Feedback	Comments
Fighter Aircraft Squadron	15	-	0.95	7	Fixed Wing Air Interdiction	6	0.95	0.95	4	Air Cruise Missile	24	0.95	0.95	24 aircraft per squadron
Military Airfield Runway	6	-	0.99	7	Fixed Wing Air Interdiction	2	0.95	0.95						2 runways per airfield
Civilian Airfield Runway	9	-	0.99	7	Fixed Wing Air Interdiction	2	0.95	0.95						2 runways per airfield
Fuel Storage Facility	15	-	0.99	7	Fixed Wing Air Interdiction	2	0.95	0.95	4	Air Cruise Missile	2	0.95	0.95	Fuel storage area plus vehicles
EW Radar Complex	3	-	0.95	7	Fixed Wing Air Interdiction	6	0.95	0.95	4	Air Cruise Missile	6	0.95	0.95	1 ground station plus 5 radar sites
SAM Control Center	1	-	0.95	7	Fixed Wing Air Interdiction	1	0.95	0.95	4	Air Cruise Missile	1	0.95	0.95	Regional SAM control center
SAM Control Radar Site	3	-	0.85	7	Fixed Wing Air Interdiction	6	0.95	0.95						1 fixed center plus 5 mobile control radar sites
SAM Launcher Battery	9	-	0.85	7	Fixed Wing Air Interdiction	5	0.95	0.95						10 launchers per battery
Naval Ship Group	3	-	0.95	7	Fixed Wing Air Interdiction	4	0.75	0.95	5	Naval Surface Engagement	4	0.9	0.95	4 surface combatant ships per group
Submarine	5	-	0.65	5	Naval Surface Engagement	1	0.50	0.75						Single submarine
Patrol Boat Group	6	-	0.85	5	Naval Surface Engagement	2	0.75	0.95	7	Fixed Wing Air Interdiction	2	0.65	0.95	4 light patrol boats per group located in two areas
Military Dock Complex	5	-	0.99	5	Naval Surface Engagement	2	0.85	0.95	7	Fixed Wing Air Interdiction	4	0.95	0.95	Military dock complex
Sea Support Facility	5	-	0.99	5	Naval Surface Engagement	2	0.85	0.95	7	Fixed Wing Air Interdiction	4	0.95	0.95	Sea support facility
Paramilitary Boat Group	5	-	0.85	5	Naval Surface Engagement	4	0.75	0.95	7	Fixed Wing Air Interdiction	8	0.65	0.95	20 paramilitary vessels per group
Sea Mine Area	5	-	0.85	5	Naval Surface Engagement	2	0.85	0.95	7	Fixed Wing Air Interdiction	2	0.45	0.95	Mined sea lane or harbor area
Residence/Bunker	8	-	0.95	14	SOF Mission	12	0.75	0.99	15	Air Recon/Surveillance	6	0.85	0.95	1 bunker plus 5 residences per mission package (not colocated)
Political Party Hqtr	1	-	0.95	14	SOF Mission	1	0.75	0.99	15	Air Recon/Surveillance	1	0.65	0.95	Political party headquarters controlled by regime
Local Party Office	10	-	0.85	14	SOF Mission	1	0.85	0.99	15	Air Recon/Surveillance	1	0.65	0.95	Local political party office controlled by regime
Political C2 Node	1	-	0.95	15	Air Recon/Surveillance	1	0.75	0.95	14	SOF Mission	1	0.65	0.99	Political commo site controlled by regime (primary)
Alternate Pol C2 Node	1	-	0.95	15	Air Recon/Surveillance	1	0.75	0.95	14	SOF Mission	1	0.65	0.99	Political commo site controlled by regime (alternate)
National Financial Net	1	-	0.85	21	Legal Proceedings	1	0.65	0.99						Financial network used to fund paramilitary forces
WMD TEL Battery	5	-	0.65	15	Air Recon/Surveillance	1	0.65	0.95	14	SOF Mission	1	0.55	0.99	22 launchers per battery located in a single region
WMD Storage Facility	5	-	0.65	15	Air Recon/Surveillance	1	0.35	0.95	14	SOF Mission	1	0.55	0.99	Concealed WMD storage facility

Military Garrison	20	-	0.99	15	Air Recon/Surveillance	1	0.95	14	SOF Mission	1	0.85	0.99	Garrison facility plus 2,600 military personnel
Military Staging Area	2	-	0.85	15	Air Recon/Surveillance	1	0.95	14	SOF Mission	1	0.85	0.99	Military staging area
Defensive Fortification	26	-	0.85	15	Air Recon/Surveillance	1	0.95	14	SOF Mission	1	0.85	0.99	Defensive fortification located within avenue of approach
Key LOC Route	2	-	0.99	15	Air Recon/Surveillance	1	0.85	14	SOF Mission	1	0.85	0.99	Key intersection of route
Weapons Cache	176	-	0.65	14	SOF Mission	1	0.75	15	Air Recon/Surveillance	1	0.35	0.95	Paramilitary safe house or weapons cache
Paramilitary Cell	2	-	0.65	14	SOF Mission	1	0.50						5,000 paramilitary personnel per cell
Paramilitary Vehicle Group	2	-	0.65	14	SOF Mission	1	0.50	15	Air Recon/Surveillance	1	0.45	0.95	82 vehicles per group
Training Camp Area	4	-	0.65	15	Air Recon/Surveillance	1	0.90	14	SOF Mission	1	0.9	0.99	Terrorist indoctrination or training camp
Infiltration Route	23	-	0.65	15	Air Recon/Surveillance	1	0.75	14	SOF Mission	1	0.75	0.99	Border infiltration route supporting foreign terrorists
Ethnic Neighborhood	18	-	0.95	15	Air Recon/Surveillance	1	0.75	14	SOF Mission	1	0.85	0.99	Specific neighborhood at risk for ethnic cleansing
Refugee Camp	9	-	0.95	25	Humanitarian Relief USAID	1	0.95	14	SOF Mission	1	0.95	0.99	Refugee camp established near border
Key Urban Area	5	-	0.95	15	Air Recon/Surveillance	1	0.85	14	SOF Mission	1	0.85	0.99	Urban area likely to be at risk for major combat operations
TV/Radio/Newspaper Media	2	-	0.95	15	Air Recon/Surveillance	1	0.95	14	SOF Mission	1	0.95	0.99	Media outlet controlled by regime
Oilfield/Processing Complex	2	-	0.99	15	Air Recon/Surveillance	1	0.95	14	SOF Mission	1	0.95	0.99	Complex of 3 oilfields plus 1 processing facility
Key Agriculture Area	1	-	0.99	15	Air Recon/Surveillance	1	0.95	14	SOF Mission	1	0.95	0.99	Key agricultural area
Oil/Gas Pipeline	10	-	0.99	15	Air Recon/Surveillance	1	0.95	14	SOF Mission	1	0.95	0.99	Oil/gas transportation pipeline
Key Worker Group	4	-	0.95	14	SOF Mission	1	0.85						Regional group of 10,000 technical workers
Insurgency Cell	4	-	0.85	14	SOF Mission	1	0.75						Potentially sympathetic insurgency group within region
Key Insurgency Leader	2	-	0.85	14	SOF Mission	1	0.85						Key leader of potentially sympathetic insurgency group
Key Parliament Official	4	-	0.85	14	SOF Mission	1	0.85						Potentially sympathetic member of parliament
City/Town Mayor	4	-	0.85	14	SOF Mission	1	0.85						Administrative leader of city, town, or village
City Utility Manager	7	-	0.85	14	SOF Mission	1	0.85						Manager of electric, gas, water, or sewage facility
Military Commander	1	-	0.85	14	SOF Mission	1	0.85						Division or brigade commander willing to capitulate
Key Cleric Official	1	-	0.85	14	SOF Mission	1	0.85						Influential religious cleric within region
Key Tribal Warlord	2	-	0.85	14	SOF Mission	1	0.85						Influential leader of key tribe or clan within region
Key Ethnic Region	1	-	0.95	26	Mill	1	0.90	14	SOF Mission	1	0.65	0.8	Potentially sympathetic civilian population
Blue Airborne Unit	4	-	0.99	11	Ground Force Operation	1	0.95						Initial US/coalition assault forces to be prepositioned
Blue Marine Unit	8	-	0.99	11	Ground Force Operation	1	0.95						Initial US/coalition assault forces to be prepositioned
Blue Ground Unit	2	-	0.99	11	Ground Force Operation	1	0.95						Initial US/coalition assault forces to be prepositioned
Overflight Agreement	1	-	0.99	1	Diplomatic Initiative	1	0.85						Overflight agreement for airlifting BLUE assault forces

Transit Agreement	5	-	0.99	1	Diplomatic Initiative	1	0.85	0.99					Transit route agreement for deploying BLUE assault forces
Staging Area Agreement	3	-	0.99	1	Diplomatic Initiative	1	0.85	0.99					Staging area agreement for deploying BLUE assault forces
Forces Agreement	1	-	0.99	1	Diplomatic Initiative	1	0.85	0.99					Military-to-military agreement for cooperative operations
Pol Neutrality Agreement	1	-	0.99	1	Diplomatic Initiative	1	0.75	0.99					Neutrality agreement that minimizes political interference
Anti-Sanctuary Agreement	1	-	0.99	1	Diplomatic Initiative	1	0.75	0.99					Agreement that removes terrorist sanctuaries along border
Mil Neutrality Agreement	1	-	0.99	1	Diplomatic Initiative	1	0.75	0.99					Military-to-military agreement for pursuit of terrorists

INITIAL FORCED ENTRY (PART 1 OF 2)

NCA Index	NCA Objective	SES Index	SES Value	Strategic Endstate	CoG Index	CoG Value	Center of Gravity	FE Index	PMESII Functional Element	Effect Class	Operational Effect	NMP Class Index	% Contrib	Individual NMP Index	Node Mission Package
1	Conduct Deception Campaign	1	70	Fix Adversary Forces	1	15	Eastern Surveillance	1	Long Range Surveillance	1	Destroy	1	100%	1-4	Lg Range Surveillance Site
					2	15	Eastern Combat Divisions	2	Tactical Reconnaissance Assembly Areas / Def Positions	12	Deception	2	100%	5-8	Tactical Recon Site
					3	10	Eastern Advance Routes	4	Border Civilian Population	13	Warning	4	100%	11-12	Border Route Civilian Area
2	Conduct Initial Forced Entry				4	20	Adversary Airpower Systems	5	Fighter/Interceptors	1	Destroy	5	100%	13-16	Fighter Aircraft Squadron
								6	Military/Civilian Airfields	1	Destroy	6	70%	17-18	Military Airfield Runway
								7	Airfield Support Facilities	1	Destroy	7	30%	19-21	Civilian Airfield Runway
								8	EW Radar Networks	1	Destroy	8	100%	22-26	Fuel Storage Facility
								9	GCI Radar Networks	1	Destroy	9	100%	27	EW Radar Complex
								10	SAM Control Radars	1	Destroy	10	100%	28	SAM Control Center
								11	SAM Batteries	1	Destroy	11	100%	29	SAM Control Radar Site
		2	80	Air/Sea Superiority				12	Naval Combatant Ships	1	Destroy	12	100%	30-32	SAM Launcher Battery
								13	Submarines	1	Destroy	13	100%	33	Naval Ship Group
								14	Littoral Patrol Boats	1	Destroy	14	100%	34	Submarine
					5	15	Adversary Seapower Systems	15	Military Seaport Docks	2	Neutralize	15	100%	35-36	Patrol Boat Group
								16	Facilities	2	Neutralize	16	100%	37-41	Military Dock Complex
								17	Paramilitary Sea Threat	1	Destroy	17	100%	42-46	Sea Support Facility
								18	Sea Mine Clearance Areas	1	Destroy	18	100%	47-48	Paramilitary Boat Group
		3	75	Persistent ISR	6	10	Key Areas of Interest	19	Red Military Installations	8	Monitor	19	100%	49-50	Sea Mine Area
								20	Red Staging Areas	8	Monitor	20	100%	51-70	Military Garrison
								21	Red Defensive Positions	8	Monitor	21	100%	71-72	Military Staging Area
								22	Red Defensive Positions	8	Monitor	22	100%	73-98	Defensive Fortification

4	80	Eliminate WMD Threat	7	20	WMD Stockpiles / Delivery Sys	22	Red Approach Routes	8	Monitor	23	100%	99-100	Key LOC Route
5	80	Degrade Regime Leadership	8	15	Top Regime Leadership	23	Paramilitary Stockpiles	8	Monitor	24	100%	101-276	Weapons Cache
						24	Paramilitary Units	8	Monitor	25	100%	277-278	Paramilitary Cell
6	65	Conduct Amphibious Assault	11	15	Western Paramilitary	25	Paramilitary Vehicles	8	Monitor	26	100%	279-280	Paramilitary Vehicle Group
						26	Terrorist Training Camps	8	Monitor	27	100%	281-284	Training Camp Area
						27	Border Infiltration Routes	8	Monitor	28	100%	285-307	Infiltration Route
						28	WMD Delivery Systems	1	Destroy	29	100%	308-312	WMD TEL Battery
						29	WMD Stockpiles	1	Destroy	30	100%	313-317	WMD Storage Facility
						30	Regime Leader	1	Destroy	31	100%	318-325	Regime Residence/Bunker
						31	Political Party Facilities	1	Destroy	32	80%	326	Political Party Hqtrs
						32	Political C2 Network	1	Destroy	33	20%	327-336	Local Party Office
						33	Regime Financial Network	2	Neutralize	34	70%	337	Political C2 Node
						34	Physical Defenses	1	Destroy	35	30%	338	Alternate Pol C2 Node
7	75	Conduct Airmobile Assault	12	20	Key Airfield Defenses	35	Physical Defenses	2	Neutralize	36	100%	339	National Financial Net
						36	Concept Military Units	1	Destroy	37	100%	340-359	Physical Impediments
8	60	Build Insurgency Axis	13	15	Southern Paramilitary	37	West Paramilitary	1	Destroy	38	100%	360-362	Military Concept Company
						38	West Paramilitary Units	1	Destroy	39	100%	363-367	Weapons Cache
9	70	Key Leader Capitulation	14	10	Western/Southern Leaders	39	West Paramilitary Vehicles	1	Destroy	40	100%	368-374	Paramilitary Cell
						40	Elite Security Units	1	Destroy	41	100%	375-383	Paramilitary Vehicle Group
10	70	Build Population Support	15	5	Cultural/Religious Support	41	South Paramilitary	1	Destroy	42	100%	384-393	Elite Security Company
						42	South Paramilitary Units	1	Destroy	43	100%	394-398	Weapons Cache
3	Set Conditions for STRO				Key Route Traffic	43	South Paramilitary Vehicles	1	Destroy	44	100%	399-403	Paramilitary Cell
						44	Cap Paramilitary	1	Destroy	45	100%	404-408	Paramilitary Vehicle Group
						45	Cap Paramilitary Stockpiles	1	Destroy	46	100%	409-413	Weapons Cache
						46	Cap Paramilitary Units	1	Destroy	47	100%	414-418	Paramilitary Cell
						47	Ministry/Parliament	1	Destroy	48	100%	419-423	Paramilitary Vehicle Group
						48	Leaders	9	Contact	49	100%	424-433	Ministry/Parliament Leader
						49	City/Town Mayors	9	Contact	50	100%	434-436	City/Town Mayor
						50	City/Town Utility Mgrs	9	Contact	51	100%	437-442	City/Town Utility Mgr
						51	Military Commanders	9	Contact	52	100%	443-444	Military Commander
						52	Key Religious Leaders	9	Contact	53	100%	445-449	Key Cleric or Religious Ldr
10	70	Build Population Support	16	20	Key Route Traffic	53	Clan/Tribal Leaders	9	Contact	54	100%	450-451	Clan Chief / Warlord
						54	Key Route Population	6	Compliance	55	100%	452-454	Local Route Neighborhood

11	60	Build Humanitarian Base	18	15	Country Green Staging Areas	53	Humanitarian Stockpiles	15	Deploy	56	100%	455-579	Relief Supply Load
						54	Staging Areas	4	Build	57	100%	580-581	Staging Site
						55	Oil / Mine / Agri Facilities	3	Protect	58	100%	582-584	Oilfield, Mine or Crop Field
						56	Pipelines / Transport Sys	3	Protect	59	100%	585-594	Pipeline or Trans Facility
						57	Technician / Worker Groups	3	Protect	60	100%	595-598	Local Technician Group
12	70	Protect National Resources	19	10	Resource Infrastructure	58	Paramilitary Units	1	Destroy	61	100%	599-602	Paramilitary Cell
						59	Paramilitary Vehicles	1	Destroy	62	100%	603-604	Paramilitary Vehicle Group
						60	Paramilitary Units	1	Destroy	63	100%	605-608	Paramilitary Cell
13	60	Protect Minority Population	20	10	Ethnic Neighborhoods	61	Paramilitary Vehicles	1	Destroy	64	100%	609-610	Paramilitary Vehicle Group

INITIAL FORCED ENTRY (PART 2 OF 2)

Node Mission Package	# of NMPs	NMP Rate	Prob of Intel Update	Action Class	Primary Action Class	Sorties /NMP	Prob Success	Prob Feedback	Action Class	Secondary Action Class	Sorties /NMP	Prob Success	Prob Feedback	Comments
Lg Range Surveillance Site	4	--	0.95	7	Fixed Wing Air Interdiction	2	0.95	0.95	4	Air Cruise Missile	2	0.95	0.95	Must destroy all sites for effective deception
Tactical Recon Site	4	--	0.95	7	Fixed Wing Air Interdiction	2	0.95	0.95	4	Air Cruise Missile	2	0.05	0.95	Must spoof all sites for effective deception Ground combat divisions are pinned down in assembly area
Ground Combat Division	2	--	0.95	7	Fixed Wing Air Interdiction	20	0.95	0.95						Civilian population along advance routes are warned combat operations
Border Route Civilian Area	2	--	0.99	26	PSYOPS Campaign (MI)	2	0.9	0.8						Destroy facilities that have been reconstituted after Phase I
Fighter Aircraft Squadron	4	--	0.95	7	Fixed Wing Air Interdiction	6	0.85	0.95	4	Air Cruise Missile	24	0.95	0.95	Destroy facilities that have been reconstituted after Phase I
Military Airfield Runway	2	--	0.99	7	Fixed Wing Air Interdiction	2	0.95	0.95						Destroy facilities that have been reconstituted after Phase I
Civilian Airfield Runway	3	--	0.99	7	Fixed Wing Air Interdiction	2	0.95	0.95						Destroy facilities that have been reconstituted after Phase I
Fuel Storage Facility	5	--	0.99	7	Fixed Wing Air Interdiction	2	0.95	0.95	4	Air Cruise Missile	2	0.95	0.95	Destroy facilities that have been reconstituted after Phase I
EW Radar Complex	1	--	0.95	7	Fixed Wing Air Interdiction	6	0.95	0.95	4	Air Cruise Missile	6	0.95	0.95	Destroy facilities that have been reconstituted after Phase I
SAM Control Center	1	--	0.95	7	Fixed Wing Air Interdiction	1	0.95	0.95	4	Air Cruise Missile	1	0.95	0.95	Destroy facilities that have been reconstituted after Phase I
SAM Control Radar Site	1	--	0.85	7	Fixed Wing Air Interdiction	6	0.95	0.95						Destroy facilities that have been reconstituted after Phase I
SAM Launcher Battery	3	--	0.85	7	Fixed Wing Air Interdiction	5	0.95	0.95						Destroy facilities that have been reconstituted after Phase I
Naval Ship Group	1	--	0.95	7	Fixed Wing Air Interdiction	4	0.75	0.95	5	Naval Surface Engagement	4	0.9	0.95	Destroy facilities that have been reconstituted after Phase I
Submarine	1	--	0.65	5	Naval Surface Engagement	1	0.50	0.75						Destroy facilities that have been reconstituted after Phase I

Patrol Boat Group	2	--	0.85	5	Naval Surface Engagement	2	0.75	0.95	7	Fixed Wing Air Interdiction	2	0.65	0.95	Destroy facilities that have been reconstituted after Phase I
Military Dock Complex	5	--	0.99	5	Naval Surface Engagement	2	0.85	0.95	7	Fixed Wing Air Interdiction	4	0.95	0.95	Destroy facilities that have been reconstituted after Phase I
Sea Support Facility	5	--	0.99	5	Naval Surface Engagement	2	0.85	0.95	7	Fixed Wing Air Interdiction	4	0.95	0.95	Destroy facilities that have been reconstituted after Phase I
Paramilitary Boat Group	2	--	0.85	5	Naval Surface Engagement	4	0.75	0.95	7	Fixed Wing Air Interdiction	8	0.65	0.95	Destroy facilities that have been reconstituted after Phase I
Sea Mine Area	2	--	0.85	5	Naval Surface Engagement	2	0.85	0.95	7	Fixed Wing Air Interdiction	2	0.45	0.95	Destroy facilities that have been reconstituted after Phase I
Military Garrison	20	--	0.99	15	Air Recon/Surveillance	1	0.95	0.95	14	SOF Mission	1	0.85	0.99	Continue monitoring
Military Staging Area	2	--	0.85	15	Air Recon/Surveillance	1	0.95	0.95	14	SOF Mission	1	0.85	0.99	Continue monitoring
Defensive Fortification	26	--	0.85	15	Air Recon/Surveillance	1	0.95	0.95	14	SOF Mission	1	0.85	0.99	Continue monitoring
Key LOC Route	2	--	0.99	15	Air Recon/Surveillance	1	0.85	0.95	14	SOF Mission	1	0.85	0.99	Continue monitoring
Weapons Cache	176	--	0.65	14	SOF Mission	1	0.75	0.99	15	Air Recon/Surveillance	1	0.35	0.95	Continue monitoring
Paramilitary Cell	2	--	0.65	14	SOF Mission	1	0.50	0.99						Continue monitoring
Paramilitary Vehicle Group	2	--	0.65	14	SOF Mission	1	0.50	0.99	15	Air Recon/Surveillance	1	0.45	0.95	Continue monitoring
Training Camp Area	4	--	0.65	15	Air Recon/Surveillance	1	0.90	0.95	14	SOF Mission	1	0.9	0.99	Continue monitoring
Infiltration Route	23	--	0.65	15	Air Recon/Surveillance	1	0.75	0.65	14	SOF Mission	1	0.75	0.99	Continue monitoring
WMD TEL Battery	5	--	0.85	7	Fixed Wing Air Interdiction	2	0.95	0.95						
WMD Storage Facility	5	--	0.99	7	Fixed Wing Air Interdiction	2	0.95	0.95	4	Air Cruise Missile	2	0.95	0.95	
Regime Residence/Bunker	8	--	0.99	7	Fixed Wing Air Interdiction	2	0.95	0.95	4	Air Cruise Missile	2	0.95	0.95	
Political Party Hqts	1	--	0.99	7	Fixed Wing Air Interdiction	2	0.95	0.95	4	Air Cruise Missile	2	0.95	0.95	
Local Party Office	10	--	0.99	7	Fixed Wing Air Interdiction	2	0.95	0.95	4	Air Cruise Missile	2	0.95	0.95	
Political C2 Node	1	--	0.95	7	Fixed Wing Air Interdiction	1	0.95	0.95	4	Air Cruise Missile	1	0.95	0.95	
Alternate Pol C2 Node	1	--	0.95	7	Fixed Wing Air Interdiction	1	0.95	0.95	4	Air Cruise Missile	1	0.95	0.95	
National Financial Ndt	1	--	0.85	21	Legal Proceedings	1	0.65	0.99						
Physical Impediments	20	--	0.99	10	Ground Artillery / MLRS	1	0.95	0.95	11	Ground Force Operation	1	0.85	0.95	1 artillery sortie or 1 company-size ground sortie per NMP
Military Conscript Company	3	--	0.95	11	Ground Force Operation	1	0.95	0.99	8	Fixed Wing Killbox / CAS	2	0.85	0.9	1 company-size ground sortie or 2 fixed wing CAS sorties per NMP
Weapons Cache	5	--	0.65	11	Ground Force Operation	1	0.95	0.99	8	Fixed Wing Killbox / CAS	2	0.85	0.9	1 company-size ground sortie or 2 fixed wing CAS sorties per NMP
Paramilitary Cell	7	--	0.8	11	Ground Force Operation	1	0.95	0.99	8	Fixed Wing Killbox / CAS	2	0.85	0.9	1 company-size ground sortie or 2 fixed wing CAS sorties per NMP
Paramilitary Vehicle Group	9	--	0.8	11	Ground Force Operation	1	0.95	0.99	8	Fixed Wing Killbox / CAS	2	0.85	0.9	1 company-size ground sortie or 2 fixed wing CAS sorties per NMP
Elite Security Company	10	--	0.8	11	Ground Force Operation	1	0.95	0.99	8	Fixed Wing Killbox / CAS	2	0.85	0.9	1 company-size ground sortie or 2 fixed wing CAS sorties per NMP
Weapons Cache	5	--	0.65	8	Fixed Wing Killbox / CAS	2	0.85	0.9						2 fixed wing CAS sorties per NMP

Paramilitary Cell	5	--	0.8	8	Fixed Wing Killbox / CAS	2	0.85	0.9	2 fixed wing CAS sorties per NMP
Paramilitary Vehicle Group	5	--	0.8	8	Fixed Wing Killbox / CAS	2	0.85	0.9	2 fixed wing CAS sorties per NMP
Weapons Cache	5	--	0.65	8	Fixed Wing Killbox / CAS	2	0.85	0.9	2 fixed wing CAS sorties per NMP
Paramilitary Cell	5	--	0.8	8	Fixed Wing Killbox / CAS	2	0.85	0.9	2 fixed wing CAS sorties per NMP
Paramilitary Vehicle Group	5	--	0.8	8	Fixed Wing Killbox / CAS	2	0.85	0.9	2 fixed wing CAS sorties per NMP
Ministry/Parliament Leader	10	--	0.99	14	SOF Mission	1	0.75	0.99	
City/Town Mayor	3	--	0.85	14	SOF Mission	1	0.75	0.99	
City/Town Utility Mgr	6	--	0.85	14	SOF Mission	1	0.75	0.99	
Military Commander	2	--	0.85	14	SOF Mission	1	0.75	0.99	
Key Cleric or Religious Ldr	5	--	0.85	14	SOF Mission	1	0.75	0.99	
Clan Chief / Warlord	2	--	0.85	14	SOF Mission	1	0.75	0.99	
Local Route Neighborhood	3	--	0.99	27	Information Campaign (Mil)	2	0.9	0.8	
Relief Supply Load	125	25	0.99	24	Humanitarian Relief (Mil)	1	0.99	0.99	20 Tons/Mission x 125 Missions
Staging Site	2	--	0.99	29	Civil Engineering Proj (Mil)	1	0.99	0.99	
Oilfield, Mine or Crop Field	3	--	0.99	11	Ground Force Operation	1	0.9	0.99	1 company-size ground sortie per site
Pipeline or Trans Facility	10	--	0.99	11	Ground Force Operation	1	0.9	0.99	1 company-size ground sortie per site
Local Technician Group	4	--	0.99	11	Ground Force Operation	1	0.9	0.99	1 company-size ground sortie per site
Paramilitary Cell	4	--	0.8	8	Fixed Wing Killbox / CAS	2	0.85	0.9	2 fixed wing CAS sorties per NMP
Paramilitary Vehicle Group	2	--	0.8	8	Fixed Wing Killbox / CAS	2	0.85	0.9	2 fixed wing CAS sorties per NMP
Paramilitary Cell	4	--	0.8	8	Fixed Wing Killbox / CAS	2	0.85	0.9	2 fixed wing CAS sorties per NMP
Paramilitary Vehicle Group	2	--	0.8	8	Fixed Wing Killbox / CAS	2	0.85	0.9	2 fixed wing CAS sorties per NMP

DECISIVE OPERATIONS (PART 1 OF 2)

NCA Index	NCA Objective	SES Index	SES Value	Strategic Endstate	CoG Index	CoG Value	Center of Gravity	FE Index	PMESI Functional Element	Effect Class	Operational Effect	NMP Class Index	% Contrib	Individual NMP Index	Node Mission Package
1	Eliminate VMD Capability	1	80	WMD Under Positive Control	1	20	WMD Stockpiles / Delivery	1	WMD TELs	1	Destroy	1	100%	1-10	WMD TEL Battery
								2	WMD Storage / Assembly	1	Destroy	2	100%	11-15	WMD Storage Facility
								3	WMD Research Labs / Plants	11	Capture	3	100%	16-17	WMD Lab or Plant
2	Eliminate Regime Power	2	80	Regime Leaders Neutralized	3	15	Key Regime Actors	4	Key Regime Leaders	11	Capture	4	100%	18-67	Regime Official
								5	Regime Residences / Bunkers	1	Destroy	5	100%	68-117	Residence or Bunker
								6	Political Party Facilities	1	Destroy	6	80%	118	Political Party Hqtrs
3	Neutralize Combat Divisions	3	65	Regime Party Neutralized	4	10	Political/Finance Nets	7	Regime Financial Networks	2	Neutralize	7	20%	119-123	Local Party Office
								8	Capital Area Paramilitary	1	Destroy	8	100%	124	National Financial Net
								9	Paramilitary Cells	1	Destroy	9	100%	125-144	Paramilitary Cell
4	Secure Natural Resources	4	80	Divs Capitate / Destroyed	6	15	Capitalizing Divisions	9	Division Leadership	3	Protect	10	100%	145-146	Division Commander
								10	Division Equipment	3	Protect	11	100%	147-148	Vehicle Assembly Area
								11	Division Troops	13	Protect	12	100%	149-152	Local Area Troops
5	Protect / Sustain Civilians	5	70	Protect National Resources	7	20	Resisting Divisions	12	Disrupting Paramil Units	1	Destroy	13	100%	153-154	Paramilitary Cell
								13	Disrupting Paramil Vehicles	1	Destroy	14	100%	155-158	Paramilitary Vehicle Group
								14	Division Leadership	11	Capture	15	100%	159-173	Division Leaders
6	Secure Natural Resources	6	70	Keep Population in Homes	8	10	Resource Infrastructure	15	Division Equipment	1	Destroy	16	80%	174-197	Combat Vehicle Group
								16	Division troops	1	Destroy	17	20%	198-245	Support Vehicle Group
								17	Oil / Mine / Agri Facilities	3	Protect	18	100%	246-317	Combat Company
7	Humanitarian Relief	7	70	Humanitarian Relief	10	15	Civilian Refuge Areas	18	Pipelines / Transport Sys	3	Protect	19	100%	318-330	Oilfield, Mine or Crop Field
								19	Technician / Worker Groups	3	Protect	20	100%	331-350	Pipeline or Trans Facility
								20	Paramilitary Units	1	Destroy	21	100%	351-360	Local Technician Group
8	Humanitarian Relief	8	70	Humanitarian Relief	11	15	Civilian Refuge Areas	21	Paramilitary Vehicles	1	Destroy	22	100%	361-368	Paramilitary Cell
								22	Cultural / Religious Ldrs	9	Contact	23	100%	369-373	Paramilitary Vehicle Group
								23	Clan/Tribal Leaders	6	Compliance	24	100%	374-375	Key Cleric or Religious Ldr
9	Humanitarian Relief	9	70	Humanitarian Relief	11	15	Civilian Refuge Areas	24	Key Route Population	6	Compliance	25	100%	376-390	Clan Chief / Warlord
								25	Relief Supplies	15	Deploy	26	100%	391-394	Local Route Neighborhood
								26	Distribution Sites	4	Build	27	100%	395-402	Relief Supply Load
10	Humanitarian Relief	10	70	Humanitarian Relief	11	15	Civilian Refuge Areas	27	Distribution Sites	4	Build	28	100%	403-406	Distribution Site
								28	Paramilitary Units	1	Destroy	29	100%	407-411	Paramilitary Cell
								29	Paramilitary Units	1	Destroy	30	100%	412-416	Paramilitary Cell

6	Establish Law and Order	8	70	Protect Minority Population	12	10	Ethnic Neighborhoods	28	Paramilitary Vehicles	1	Destroy	30	100%	412-413	Paramilitary Vehicle Group
								29	Paramilitary Units	1	Destroy	31	100%	414-415	Paramilitary Cell
								30	Paramilitary Vehicles	1	Destroy	32	100%	416-417	Paramilitary Vehicle Group
								31	Training Camps	1	Destroy	33	100%	418-427	Training Facility
								32	Terrorist Bunkers	1	Destroy	34	100%	428-452	Bunker Complex
								33	Terrorist Personnel	1	Destroy	35	100%	453-455	Terrorist Cell
								34	Terrorist Personnel	1	Destroy	36	100%	456-458	Terrorist Cell
								35	Criminal Networks	11	Capture	37	100%	459-463	Criminal Cell
								36	Criminal Networks	3	Protect	38	100%	464-473	Convoy Overwatch Route
								37	Convoy Security	1	Destroy	39	100%	474-476	Paramilitary Cell
								38	Paramilitary Units	1	Destroy	40	100%	477-479	Paramilitary Vehicle Group
7	Protect Coalition Logistics	12	80	Protect Convoys / Assby Areas	16	15	Coalition Supply Convoys	39	Paramilitary Vehicles	1	Destroy	41	100%	480-483	Terrorist Cells
								40	Terrorist Cells	3	Protect	42	100%	484-498	Assembly Area Perimeter
								41	Assembly Area Security	1	Destroy	43	100%	499	Paramilitary Cell
								42	Paramilitary Units	1	Destroy	44	100%	500	Paramilitary Vehicle Group
								43	Paramilitary Vehicles	1	Destroy	45	100%	501	Terrorist Cell

DECISIVE OPERATIONS (PART 2 OF 2)

Node Mission Package	# of NMPs	NMP Rate	Prob of Intel Update	Action Class	Primary Action Class	Sorties /NMP	Prob Success	Prob Feedback	Action Class	Secondary Action Class	Sorties /NMP	Prob Success	Prob Feedback	Comments
WMD TEL Battery	10	--	0.85	7	Fixed Wing Air Interdiction	2	0.95	0.95						
WMD Storage Facility	5	--	0.99	7	Fixed Wing Air Interdiction	2	0.95	0.95	4	Air Cruise Missile	2	0.95	0.95	
WMD Lab or Plant	2	--	0.99	11	Ground Force Operation	1	0.95	0.99						
Regime Official	50	5	0.65	14	SOF Mission Ground Force Operation	1	0.75	0.99						Total Includes 25 NMPs set aside as TSTs
Residence of Bunker	50	5	0.8	11	Ground Force Operation	1	0.95	0.99	8	Fixed Wing Killbox / CAS	2	0.85	0.9	Total Includes 25 NMPs set aside as TSTs
Political Party Hdqrs	1	--	0.8	11	Ground Force Operation	1	0.95	0.99	8	Fixed Wing Killbox / CAS	2	0.85	0.9	
Local Party Office	5	--	0.8	11	Ground Force Operation	1	0.95	0.99	8	Fixed Wing Killbox / CAS	2	0.85	0.9	
National Financial Nit	1	--	0.85	21	Legal Proceedings Ground Force Operation	1	0.65	0.99						
Paramilitary Cell	20	--	0.8	11	Ground Force Operation	1	0.95	0.99	8	Fixed Wing Killbox / CAS	2	0.85	0.9	Total Includes 10 NMPs set aside as TSTs
Division Commandel	2	--	0.99	14	SOF Mission	1	0.95	0.99						2 Divisions assumed to capitulate
Vehicle Assembly Aea	2	--	0.99	11	Ground Force	1	0.9	0.99						

Local Area Troops	4	--	0.99	11	Operation	1	0.9	0.99							
Paramilitary Cell	2	--	0.8	11	Ground Force Operation	1	0.95	0.99	Fixed Wing Killbox / CAS	2	0.85	0.9			
Paramilitary Vehicle Group	4	--	0.8	11	Ground Force Operation	1	0.95	0.99	Fixed Wing Killbox / CAS	2	0.85	0.9			
Division Leaders	15	3	0.65	14	SOF Mission	1	0.75	0.99							
Combat Vehicle Group	24	4	0.8	8	Fixed Wing Killbox / CAS	16	0.85	0.9	Ground Force Operation	8	0.95	0.99			(2 Divisions = 40 Battalions) x 60% = 24 mission packages
Support Vehicle Group	48	8	0.8	8	Fixed Wing Killbox / CAS	16	0.85	0.9	Ground Force Operation	8	0.95	0.99			
Combat Company	72	12	0.8	8	Fixed Wing Killbox / CAS	2	0.85	0.9	Ground Force Operation	1	0.95	0.99			120 Companies x 60% = 72 mission packages
Oilfield, Mine or Crop Field	13	--	0.99	11	Ground Force Operation	1	0.9	0.99							
Pipeline or Trans Facility	20	--	0.99	11	Ground Force Operation	1	0.9	0.99							
Local Technician Group	10	--	0.99	11	Ground Force Operation	1	0.9	0.99							
Paramilitary Cell	8	--	0.8	8	Fixed Wing Killbox / CAS	2	0.85	0.9							
Paramilitary Vehicle Group	5	--	0.8	8	Fixed Wing Killbox / CAS	2	0.85	0.9							
Key Cleric or Religious Ldr	2	--	0.85	14	SOF Mission Information Campaign	1	0.75	0.99							
Clan Chief / Warlord	15	--	0.99	27	Information Campaign (Mil)	2	0.9	0.8							
Local Route Neighborhood	4	--	0.99	27	Information Campaign (Mil)	2	0.9	0.8							
Relief Supply Load	8	2	0.99	24	Humanitarian Relief (Mil)	1	0.99	0.99							20 Tons/Mission x 8 Missions = 160 Tons
Distribution Site	4	--	0.99	29	Civil Engineering Proj (Mil)	1	0.99	0.99							
Paramilitary Cell	5	--	0.8	8	Fixed Wing Killbox / CAS	2	0.85	0.9							
Paramilitary Vehicle Group	2	--	0.8	8	Fixed Wing Killbox / CAS	2	0.85	0.9							
Paramilitary Cell	2	--	0.8	8	Fixed Wing Killbox / CAS	2	0.85	0.9							
Paramilitary Vehicle Group	2	--	0.8	8	Fixed Wing Killbox / CAS	2	0.85	0.9							
Training Facility	10	--	0.8	8	Fixed Wing Killbox / CAS	2	0.85	0.9							
Bunker Complex	25	--	0.8	8	Fixed Wing Killbox / CAS	2	0.85	0.9							Total Includes 20 NMPs set aside as ISTs
Terrorist Cell	3	--	0.7	11	Ground Force Operation	1	0.95	0.99	Fixed Wing Killbox / CAS	2	0.85	0.9			
Terrorist Cell	3	--	0.7	11	Ground Force Operation	1	0.95	0.99	Fixed Wing Killbox / CAS	2	0.85	0.9			
Criminal Cell	5	--	0.65	14	SOF Mission	1	0.75	0.99							

Convoy Overwatch Routi	10	2	0.8	11	Ground Force Operation	1	0.95	0.99		Fixed Wing Killbox / CAS	2	0.85	0.9
Paramilitary Cell	3	1	0.8	11	Ground Force Operation	1	0.95	0.99	8	Fixed Wing Killbox / CAS	2	0.85	0.9
Paramilitary Vehicle Group	3	1	0.8	11	Ground Force Operation	1	0.95	0.99	8	Fixed Wing Killbox / CAS	2	0.85	0.9
Terrorist Cells	4	1	0.8	11	Ground Force Operation	1	0.95	0.99	8	Fixed Wing Killbox / CAS	2	0.85	0.9
Assembly Area Perimetr	15	2	0.8	11	Ground Force Operation	1	0.95	0.99		Fixed Wing Killbox / CAS	2	0.85	0.9
Paramilitary Cell	1	--	0.8	11	Ground Force Operation	1	0.95	0.99	8	Fixed Wing Killbox / CAS	2	0.85	0.9
Paramilitary Vehicle Group	1	--	0.8	11	Ground Force Operation	1	0.95	0.99	8	Fixed Wing Killbox / CAS	2	0.85	0.9
Terrorist Cell	1	--	0.8	11	Ground Force Operation	1	0.95	0.99	8	Fixed Wing Killbox / CAS	2	0.85	0.9

STABILITY AND RECONSTRUCTION (PART 1 OF 2)

NCA Index	NCA Objective	SES Index	SES Value	Strategic Endstate	CoG Index	CoG Value	Center of Gravity	FE Index	PMESII Functional Element	Effect Class	Operational Effect	NMP Class Index	% Contrib	Individual NMP Index	Node Mission Package
1	Defeat Violent Spoilers	1	80	Isolate / Defeat Spoilers	2	20	Operating Spoiler cells	1	Ethnic Leader Cooperation	9	Contact	1	100%	1-30	Local Community Leader
								2	Media Outlets	14	Promote Image	2	100%	31-60	TV/Radio/Newspaper Office
								3	Terrorist Leadership	11	Capture	3	100%	61-95	Terrorist Cell Leader
								4	Terrorist Cells	1	Destroy	4	100%	96-100	Terrorist Cell
								5	Terrorist Weapons Cache	1	Destroy	5	100%	101-250	Weapons Cache
								6	Terrorist Support Networks	2	Neutralize	6	100%	251-255	Support Network
								7	IED Consequence Mgmt	4	Restore	7	80%	256-755	Medical Injury Site
								8	Insurgency Attack Sites	4	Restore	8	20%	756-1255	Facility Damage Site
								9	Civil Population Support	6	Compliance	9	100%	1256-1325	Local Neighborhood
								10	Media Outlets Community Leader	14	Promote Image	10	100%	1326-1355	TV/Radio/Newspaper Office
2	Co-opt Nonviolent Spoilers	2	50	Restrain Disruption Agents	4	10	Ethnic Communication	11	Media Outlets	9	Contact	11	100%	1356-1505	Local Community Leader
								12	Media Outlets	14	Promote Image	12	100%	1506-1535	TV/Radio/Newspaper Office
								13	Spoiler Org Leadership	9	Contact	13	100%	1536-1565	Spoiler Org Leader
								14	Spoiler Org Agents	6	Compliance	14	100%	1566-1625	Local Spoiler Org Cell
								15	Spoiler Org Followers	6	Compliance	15	100%	1626-1686	Local Neighborhood Areas
								16	Media Outlets	14	Promote Image	16	100%	1687-1715	TV/Radio/Newspaper Office
								17	Protest Consequence Mgmt	4	Restore	17	80%	1716-1740	Medical Injury Site
								18	Major Disruption Sites	4	Restore	18	20%	1741-1765	Facility Damage Site
								19	Civil Population Support	6	Compliance	19	100%	1766-1790	Local Neighborhood
								20	Media Outlets	14	Promote Image	20	100%	1791-1820	TV/Radio/Newspaper Office
3	Estab Next State Conditions	3	70	Civil Law and Order	7	10	Civil Administration	21	Civil Admin Functions	4	Restore	21	70%	1821-1870	Local Admin Office
								22	National/Local Elections	3	Protect	22	30%	1871-1920	Admin Official Vetting
								23	Media Outlets	14	Promote Image	23	100%	1921-1936	Election Event
								24	Admin Office Security	3	Protect	24	100%	1937-1966	TV/Radio/Newspaper Office
								25	Recruit Police Personnel	4	Restore	25	100%	1967-2016	Area Security Site
								26	National Police Force	4	Restore	26	100%	2017-2031	Recruitment Program
								27		15	Deploy	27	50%	2032-2046	Police Training Facility
								28		15	Deploy	28	50%	2047-2061	Training Program Delivery

4	60	Public Infrastructure	10	15	Electricity / Water / Sewage	Media Outlets	14	Promote Image	29	100%	2062-2091	TV/Radio/Newspaper Office		
												26	2092-2103	Electric Power Facility
5	50	Public Health Services	11	10	Public Education	Media Outlets	3	Protect	33	100%	2104-2125	Water / Sewer Facility		
												27	2126-2155	TV/Radio/Newspaper Office
												28	2156-2189	Area Security Site
												29	2190-2204	Communications Facility
												30	2205-2234	Media Center Facility
												31	2235-2264	TV/Radio/Newspaper Office
												32	2265-2279	Area Security Site
												33	2280-2324	School Building
												34	2325-2354	TV/Radio/Newspaper Office
												35	2355-2364	Bridge
												36	2365-2366	Roadway
												37	2367-2371	Rail Line
6	80	National Military Forces	13	15	Public Health Systems	Media Outlets	3	Protect	38	100%	2372-2401	TV/Radio/Newspaper Office		
												39	2402-2405	Area Security Site
												40	2406-2413	Hospital or Clinic
												41	2414-2418	Medical Supply Lead
												42	2419-2448	TV/Radio/Newspaper Office
												43	2449-2558	Military Officer Vetting
												44	2559-2566	NCO / Enlisted Vetting
												45	2567	Military Training Facility
												46	2568-2575	Training Program Delivery
7	50	Economic Development Aid	14	20	National Military Forces	Media Outlets	15	Deploy	47	60%	2576-2655	Combat Vehicle Group		
												47	2656-2660	Soldier Equipment Group
												48	2681-2710	TV/Radio/Newspaper Office
												49	2711-2718	Aid / Monetary Agreement
												50	2719-2753	Project Coordination
												51	2754-2788	Area Security Site
												52	2789-2818	TV/Radio/Newspaper Office
8	50	PVO/INGO	16	10	PVO/INGO	Media Outlets	9	Contact	48	100%	2819-2853	Project Coordination		
												49	2854-2860	Project Coordination
												53	2854-2860	Project Coordination

Synchronization		Organizations		PVO/NGO Protection		Protect Promote Image		Area Security Site	
				54		3		2854-2888	
				55		14		2889-2918	
				Media Outlets				TV/Radio/Newspaper Office	
								60	
								100%	
								61	
								100%	

STABILITY AND RECONSTRUCTION (PART 2 OF 2)

Node Mission Package	# of NMPs	NMP Rate	Prob of Intel Update	Action Class	Primary Action Class	Sorties /NMP	Prob Success	Prob Feedback	Action Class	Secondary Action Class	Sorties /NMP	Prob Success	Prob Feedback	Comments
Local Community Leader	30	0.2	0.8	13	Stability & Security Op (Mil)	1	0.9	0.99						30 leaders contacted to gain intelligence
TV/Radio/Newspaper Office	30	0.2	0.99	27	Information Campaign	1	0.7	0.7						
Terrorist Cell Leader	35	0.2	0.8	11	Ground Force Operation	1	0.8	0.99	13	Stability & Security Op	1	0.8	0.99	35 terrorist leaders captures to gain intelligence
Terrorist Cell	5	0.1	0.8	11	Ground Force Operation	1	0.8	0.99	13	Stability & Security Op	1	0.8	0.99	5 major terrorist cells broken up
Weapons Cache	150	1	0.8	11	Ground Force Operation	1	0.8	0.99	13	Stability & Security Op	1	0.8	0.99	
Support Network	5	0.1	0.8	11	Ground Force Operation	1	0.8	0.99	13	Stability & Security Op	1	0.8	0.99	
Medical Injury Site	500	--	0.99	22	Civ Medical Mission (Mil)	1	0.95	0.99	23	Civ Medical Mission (UN)	1	0.95	0.99	Total Includes 500 NMPs set aside as TSTs
Facility Damage Site	500	--	0.99	31	Pub Utility Restore (Cont)	1	0.95	0.99	29	Civil Engineering Proj (Mil)	1	0.99	0.99	Total Includes 500 NMPs set aside as TSTs
Local Neighborhood	70	0.25	0.99	27	Information Campaign (Mil)	1	0.7	0.7	28	Info Campaign (USAID)	1	0.7	0.7	
TV/Radio/Newspaper Office	30	0.2	0.99	27	Information Campaign (Mil)	1	0.7	0.7						
Local Community Leader	150	1	0.99	1	Diplomatic Initiative Information Campaign	1	0.8	0.99						150 leaders contacted to co-opt support for coalition
TV/Radio/Newspaper Office	30	0.2	0.99	27	Information Campaign (Mil)	1	0.7	0.7						
Spoiler Org Leader	30	0.2	0.8	1	Diplomatic Initiative	1	0.8	0.99						15 non-violent spoiler organizations x 2 leaders/organization
Local Spoiler Org Cdr	60	0.25	0.8	13	Stability & Security Op (Mil)	1	0.9	0.99						15 non-violent spoiler organizations operating x 4 cells/organization
Local Neighborhood Areas	60	0.25	0.99	27	Information Campaign (Mil)	1	0.7	0.7	28	Info Campaign (USAID)	1	0.7	0.7	
TV/Radio/Newspaper Office	30	0.2	0.99	27	Information Campaign (Mil)	1	0.7	0.7						
Medical Injury Site	25	--	0.99	22	Civ Medical Mission (Mil)	1	0.95	0.99	23	Civ Medical Mission (UN)	1	0.95	0.99	Total Includes 25 NMPs set aside as TSTs
Facility Damage Site	25	--	0.99	31	Pub Utility Restore (Cont)	1	0.95	0.99	29	Civil Engineering Proj (Mil)	1	0.99	0.99	Total Includes 25 NMPs set aside as TSTs
Local Neighborhood	25	--	0.99	27	Information Campaign (Mil)	1	0.7	0.7	28	Info Campaign (USAID)	1	0.7	0.7	
TV/Radio/Newspaper Office	30	0.2	0.99	27	Information Campaign (Mil)	1	0.7	0.7						

Local Admin Office	50	1	0.99	33	Civil Govt Function (State)	1	0.95	0.99	32	Civil Govt Function (Mil)	1	0.95	0.99	50 provincial, city, town, or village officials
Admin Official Vetting	50	1	0.99	33	Civil Govt Function (State)	1	0.95	0.99	32	Civil Govt Function (Mil)	1	0.95	0.99	
Election Event	16	0.2	0.99	13	Stability & Security Op (USAID)	1	0.8	0.99	27	Information Campaign (Mil)	1	0.7	0.7	1 national election + 15 local provincial elections
TV/Radio/NewsaperOffice	30	0.2	0.99	28	Info Campaign (USAID)	1	0.7	0.7						
Area Security Site	50	0.25	0.99	13	Stability & Security Op (Cont)	1	0.9	0.99						
Recruitment Program	15	0.1	0.99	34	Military/Police Training (Mil)	1	0.6	0.8						1 police program in each of 15 provinces
Police Training Facility	15	0.1	0.99	29	Civil Engineering Proj (USAID)	1	0.99	0.99						1 police program in each of 15 provinces
Training Program Delivery	15	0.1	0.99	34	Military/Police Training (USAID)	1	0.6	0.8						1 police program in each of 15 provinces
TV/Radio/NewsaperOffice	30	0.2	0.99	28	Info Campaign (Cont)	1	0.7	0.7	27	Information Campaign (Mil)	1	0.7	0.7	
Electric Power Facility	12	0.1	0.99	31	Pub Utility Restore (Cont)	1	0.95	0.99	30	Pub Utility Restore (Mil)	1	0.95	0.99	
Water / Sewer Facility	22	0.1	0.99	31	Pub Utility Restore (Cont)	1	0.95	0.99	30	Pub Utility Restore (Mil)	1	0.95	0.99	
TV/Radio/NewsaperOffice	30	0.2	0.99	28	Info Campaign (USAID)	1	0.7	0.7						
Area Security Site	34	0.2	0.99	13	Stability & Security Op (Cont)	1	0.9	0.99	35	Contractor Security (Mil)	1	0.9	0.99	
Communications Facility	15	0.1	0.99	31	Pub Utility Restore (Cont)	1	0.95	0.99	30	Pub Utility Restore (Mil)	1	0.95	0.99	1 site in each of 15 provinces
Media Center Facility	30	1	0.99	31	Pub Utility Restore (Cont)	1	0.95	0.99	30	Pub Utility Restore (Mil)	1	0.95	0.99	
TV/Radio/NewsaperOffice	30	0.2	0.99	28	Info Campaign (USAID)	1	0.7	0.7						
Area Security Site	15	0.2	0.99	13	Stability & Security Op (Cont)	1	0.9	0.99						
School Building	45	0.2	0.99	31	Pub Utility Restore (Cont)	1	0.95	0.99	30	Pub Utility Restore (Mil)	1	0.95	0.99	
TV/Radio/Newsape Office	30	0.2	0.99	28	Info Campaign (USAID)	1	0.7	0.7						
Bridge	10	0.1	0.99	31	Pub Utility Restore (Cont)	1	0.95	0.99	29	Civil Engineering Proj (Mil)	1	0.99	0.99	
Roadway	2	0.1	0.99	31	Pub Utility Restore (Cont)	1	0.95	0.99	29	Civil Engineering Proj (Mil)	1	0.99	0.99	
Rail Line	5	0.1	0.99	31	Pub Utility Restore (Cont)	1	0.95	0.99	29	Civil Engineering Proj (Mil)	1	0.99	0.99	
TV/Radio/Newsape Office	30	0.2	0.99	28	Info Campaign (USAID)	1	0.7	0.7						
Area Security Site	4	0.1	0.99	13	Stability & Security Op (Cont)	1	0.9	0.99	35	Contractor Security (Mil)	1	0.9	0.99	
Hospital or Clinic	8	0.2	0.99	31	Pub Utility Restore (Cont)	1	0.95	0.99						
Medical Supply Loac	5	0.1	0.99	24	Humanitarian Relief (Mil)	1	0.99	0.99						10 tons/mission x 5 missions
TV/Radio/Newsape Office	30	0.2	0.99	28	Info Campaign (USAID)	1	0.7	0.7						
Military Officer Vetting	110	5	0.99	34	Military/Police Training (Cont)	1	0.95	0.99						
NCO / Enlisted Vetting	8	0.1	0.99	34	Military/Police Training (Cont)	1	0.6	0.8						Soldiers recruited in blocks of 500 x 8 groups

Military Training Facility	1	-	0.99	29	Civil Engineering Proj (Mit)	1	0.99	0.99					
Training Program Delivery	8	0.05	0.99	34	Military/Police Training (USAID)	1	0.6	0.8					Soldiers trained in blocks of 500 x 8 groups
Combat Vehicle Group	80	0.5	0.99	20	Economic Grants (USAID)	1	0.95	0.99					200 vehicles delivered/group x 80 groups
Soldier Equipment Group	25	0.5	0.99	20	Economic Grants (USAID)	1	0.95	0.99					20 tons/mission x 25 missions
TV/Radio/NewsPaperOffice	30	0.2	0.99	27	Information Campaign (Mit)	1	0.7	0.7					
Aid / Monetary Agreement	8	--	0.99	1	Diplomatic Initiative (Mit)	1	0.8	0.99					
Project Coordination	35	0.25	0.99	27	Information Campaign (Mit)	1	0.7	0.7					35 corporations initiating industrial / agricultural project
Area Security Site	35	0.25	0.99	35	Contractor Security (USAID)	1	0.9	0.99	13	Stability & Security Op Information Campaign (Mit)	1	0.9	0.99
TV/Radio/NewsPaperOffice	30	0.2	0.99	28	Info Campaign (USAID)	1	0.7	0.7	27		1	0.7	0.7
Project Coordination	35	0.25	0.99	27	Information Campaign (Mit)	1	0.7	0.7					35 Private/Voluntary Orgs or Non-Govt Orgs initiating a projects
Area Security Site	35	0.25	0.99	35	Contractor Security (USAID)	1	0.9	0.99	13	Stability & Security Op Information Campaign (Mit)	1	0.9	0.99
TV/Radio/NewsPaperOffice	30	0.2	0.99	28	Info Campaign (USAID)	1	0.7	0.7	27		1	0.7	0.7

APPENDIX B

**STAFF ACTOR KNOWLEDGE
CHARACTERISTICS (BASELINE)**

TASK 1-3 IDENTIFY DESIRED STRATEGIC ENDSTATES

Task Description

Task 1-3 begins the construction of focal knowledge within the simulated JTF planning rhythm. The task produces the first level of decomposition of the *NCA Objectives* into a set a desired *Strategic Endstates* for each phase of the operational campaign.

Task Participation

Task 1-3 is led by the Joint Coordination Board (JCB) that is nominally comprised of the following primary actors:

- JTF Commander
- Ambassador
- Director, Joint Interagency Coordination Group.

The primary actors engage in an initial execution of Task 1-3. If the number of identified *Strategic Endstates* reaches the set threshold level specified in the model, the task is considered completed –otherwise, the task is re-executed after supporting the JCB with secondary actors. Secondary actors supporting the JCB include

- JTF Information Superiority Chief
- Information Superiority Officer
- Effects Assessment Supervisor
- Information Operations Supervisor
- JTF Plans Officer
- Political/Military Planner
- Red/Blue Planner
- JTF Operations Chief
- Fires/Targeting Officer
- JFACC Liaison
- JFLCC Liaison
- JFMCC Liaison
- JSOTF Liaison

Area and Level of Staff Expertise

The following set of tables indicate the areas and levels of knowledge characterizing each of the actors listed as participating in Task 1-3.

JTF Commander

	Political Endstates	Military Endstates	Economic Endstates	Social Endstates	Information Endstates	Infrastructure Endstates
Set Conditions	High (0.8-1.0)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	High (0.8-1.0)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	High (0.8-1.0)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)

Ambassador

	Political Endstates	Military Endstates	Economic Endstates	Social Endstates	Information Endstates	Infrastructure Endstates
Set Conditions	High (0.8-1.0)	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	High (0.8-1.0)	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	High (0.8-1.0)	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	High (0.8-1.0)	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)

Director, Joint Interagency Coordination Group

	Political Endstates	Military Endstates	Economic Endstates	Social Endstates	Information Endstates	Infrastructure Endstates
Set Conditions	Medium (0.5-0.7)	Nil (0.0)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)
Initial Forced Entry	Medium (0.5-0.7)	Nil (0.0)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)
Decisive Operations	Medium (0.5-0.7)	Nil (0.0)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)
Stability / Reconstruction	Medium (0.5-0.7)	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)

JTF Information Superiority Chief

	Political Endstates	Military Endstates	Economic Endstates	Social Endstates	Information Endstates	Infrastructure Endstates
Set Conditions	Medium (0.5-0.7)	Medium (0.5-0.7)	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Medium (0.5-0.7)	Medium (0.5-0.7)	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Medium (0.5-0.7)	Medium (0.5-0.7)	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Medium (0.5-0.7)	Medium (0.5-0.7)	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)

Information Superiority Officer

	Political Endstates	Military Endstates	Economic Endstates	Social Endstates	Information Endstates	Infrastructure Endstates
Set Conditions	Low (0.2-0.4)	Medium (0.5-0.7)	Nil (0.0)	Low (0.2-0.4)	High (0.8-1.0)	Nil (0.0)
Initial Forced Entry	Low (0.2-0.4)	Medium (0.5-0.7)	Nil (0.0)	Low (0.2-0.4)	High (0.8-1.0)	Nil (0.0)
Decisive Operations	Low (0.2-0.4)	Medium (0.5-0.7)	Nil (0.0)	Low (0.2-0.4)	High (0.8-1.0)	Nil (0.0)
Stability / Reconstruction	Low (0.2-0.4)	Medium (0.5-0.7)	Nil (0.0)	Low (0.2-0.4)	High (0.8-1.0)	Nil (0.0)

Effects Assessment Supervisor

	Political Endstates	Military Endstates	Economic Endstates	Social Endstates	Information Endstates	Infrastructure Endstates
Set Conditions	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)	Medium (0.5-0.7)
Initial Forced Entry	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)	Medium (0.5-0.7)
Decisive Operations	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)	Medium (0.5-0.7)
Stability / Reconstruction	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)	Medium (0.5-0.7)

Information Operations Supervisor

	Political Endstates	Military Endstates	Economic Endstates	Social Endstates	Information Endstates	Infrastructure Endstates
Set Conditions	Low (0.2-0.4)	Low (0.2-0.4)	Nil (0.0)	Low (0.2-0.4)	High (0.8-1.0)	Nil (0.0)
Initial Forced Entry	Low (0.2-0.4)	Low (0.2-0.4)	Nil (0.0)	Low (0.2-0.4)	High (0.8-1.0)	Nil (0.0)
Decisive Operations	Low (0.2-0.4)	Low (0.2-0.4)	Nil (0.0)	Low (0.2-0.4)	High (0.8-1.0)	Nil (0.0)
Stability / Reconstruction	Low (0.2-0.4)	Low (0.2-0.4)	Nil (0.0)	Low (0.2-0.4)	High (0.8-1.0)	Nil (0.0)

JTF Plans Officer

	Political Endstates	Military Endstates	Economic Endstates	Social Endstates	Information Endstates	Infrastructure Endstates
Set Conditions	Low (0.2-0.4)	Medium (0.5-0.7)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Initial Forced Entry	Low (0.2-0.4)	Medium (0.5-0.7)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Decisive Operations	Low (0.2-0.4)	Medium (0.5-0.7)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Stability / Reconstruction	Low (0.2-0.4)	Medium (0.5-0.7)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)

Political/Military Planner

	Political Endstates	Military Endstates	Economic Endstates	Social Endstates	Information Endstates	Infrastructure Endstates
Set Conditions	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)

Red/Blue Planner

	Political Endstates	Military Endstates	Economic Endstates	Social Endstates	Information Endstates	Infrastructure Endstates
Set Conditions	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Initial Forced Entry	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Decisive Operations	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Stability / Reconstruction	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)

JTF Operations Chief

	Political Endstates	Military Endstates	Economic Endstates	Social Endstates	Information Endstates	Infrastructure Endstates
Set Conditions	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Initial Forced Entry	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Decisive Operations	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Stability / Reconstruction	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)

Fires/Targeting Officer

	Political Endstates	Military Endstates	Economic Endstates	Social Endstates	Information Endstates	Infrastructure Endstates
Set Conditions	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)
Decisive Operations	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)
Stability / Reconstruction	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)

JFACC Liaison

	Political Endstates	Military Endstates	Economic Endstates	Social Endstates	Information Endstates	Infrastructure Endstates
Set Conditions	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Initial Forced Entry	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Decisive Operations	Low (0.2-0.4)	Medium (0.5-0.7)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Stability / Reconstruction	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)

JFLCC Liaison

	Political Endstates	Military Endstates	Economic Endstates	Social Endstates	Information Endstates	Infrastructure Endstates
Set Conditions	Low (0.2-0.4)	Medium (0.5-0.7)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Initial Forced Entry	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Decisive Operations	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Stability / Reconstruction	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)

JFMCC Liaison

	Political Endstates	Military Endstates	Economic Endstates	Social Endstates	Information Endstates	Infrastructure Endstates
Set Conditions	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Initial Forced Entry	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Decisive Operations	Low (0.2-0.4)	Medium (0.5-0.7)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Stability / Reconstruction	Low (0.2-0.4)	Medium (0.5-0.7)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)

JSOTF Liaison

	Political Endstates	Military Endstates	Economic Endstates	Social Endstates	Information Endstates	Infrastructure Endstates
Set Conditions	Medium (0.5-0.7)	High (0.8-1.0)	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)
Initial Forced Entry	Medium (0.5-0.7)	High (0.8-1.0)	Low (0.2-0.4)	Medium (0.5-0.7)	Low (0.2-0.4)	Low (0.2-0.4)
Decisive Operations	Medium (0.5-0.7)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Low (0.2-0.4)	Low (0.2-0.4)
Stability / Reconstruction	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)

TASK 1-4 IDENTIFY CENTERS OF GRAVITY

Task Description

Task 1-4 continues the construction of focal knowledge within the simulated JTF planning rhythm. The task produces the second level of decomposition of the desired *Strategic Endstates* into a set of *Centers of Gravity* for each phase of the operational campaign.

Task Participation

Task 1-4 is led by the core *Joint Planning Group* (JPG) that is nominally comprised of the following primary actors:

- JTF Commander
- Deputy JTF Commander
- Information Operations Officer
- JTF Plans Chief
- Ground (Army) Planner
- Ground (Marines) Planner
- Air Planner
- Maritime Planner
- Special Operations Planner
- Political/Military Planner

The primary actors engage in an initial execution of Task 1-4. If the number of identified *Centers of Gravity* reaches the set threshold level specified in the model, the task is considered completed—otherwise, the task is re-executed after supporting the core JPG with secondary actors. Secondary actors supporting the core JPG include

- STO Planner
- Operations Law Planner
- Red/Blue Planner
- Force Protection Planner
- Deployment Planner

Area and Level of Staff Expertise

The following set of tables indicate the areas and levels of knowledge characterizing each of the actors listed as participating in Task 1-4.

JTF Commander

	Political CoGs	Military CoGs	Economic CoGs	Social CoGs	Information CoGs	Infrastructure CoGs
Set Conditions	High (0.8-1.0)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	High (0.8-1.0)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	High (0.8-1.0)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)

Deputy JTF Commander

	Political CoGs	Military CoGs	Economic CoGs	Social CoGs	Information CoGs	Infrastructure CoGs
Set Conditions	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)

Information Operations Officer

	Political CoGs	Military CoGs	Economic CoGs	Social CoGs	Information CoGs	Infrastructure CoGs
Set Conditions	Low (0.2-0.4)	Low (0.2-0.4)	Nil (0.0)	Low (0.2-0.4)	High (0.8-1.0)	Nil (0.0)
Initial Forced Entry	Low (0.2-0.4)	Low (0.2-0.4)	Nil (0.0)	Low (0.2-0.4)	High (0.8-1.0)	Nil (0.0)
Decisive Operations	Low (0.2-0.4)	Low (0.2-0.4)	Nil (0.0)	Low (0.2-0.4)	High (0.8-1.0)	Nil (0.0)
Stability / Reconstruction	Low (0.2-0.4)	Low (0.2-0.4)	Nil (0.0)	Low (0.2-0.4)	High (0.8-1.0)	Nil (0.0)

JTF Plans Chief

	Political CoGs	Military CoGs	Economic CoGs	Social CoGs	Information CoGs	Infrastructure CoGs
Set Conditions	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)

Ground (Army) Planner

	Political CoGs	Military CoGs	Economic CoGs	Social CoGs	Information CoGs	Infrastructure CoGs
Set Conditions	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)
Initial Forced Entry	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)
Decisive Operations	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)
Stability / Reconstruction	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)

Ground (Marines) Planner

	Political CoGs	Military CoGs	Economic CoGs	Social CoGs	Information CoGs	Infrastructure CoGs
Set Conditions	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)
Initial Forced Entry	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)
Decisive Operations	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)
Stability / Reconstruction	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)

Air Planner

	Political CoGs	Military CoGs	Economic CoGs	Social CoGs	Information CoGs	Infrastructure CoGs
Set Conditions	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Nil (0.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)

Maritime Planner

	Political CoGs	Military CoGs	Economic CoGs	Social CoGs	Information CoGs	Infrastructure CoGs
Set Conditions	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Nil (0.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)

Special Operations Planner

	Political CoGs	Military CoGs	Economic CoGs	Social CoGs	Information CoGs	Infrastructure CoGs
Set Conditions	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	High (0.8-1.0)	High (0.8-1.0)	Medium (0.5-0.7)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)

Political/Military Planner

	Political CoGs	Military CoGs	Economic CoGs	Social CoGs	Information CoGs	Infrastructure CoGs
Set Conditions	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)

STO Planner

	Political CoGs	Military CoGs	Economic CoGs	Social CoGs	Information CoGs	Infrastructure CoGs
Set Conditions	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)

Operation: Law Planner

	Political CoGs	Military CoGs	Economic CoGs	Social CoGs	Information CoGs	Infrastructure CoGs
Set Conditions	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)

Red/Blue Planner

	Political CoGs	Military CoGs	Economic CoGs	Social CoGs	Information CoGs	Infrastructure CoGs
Set Conditions	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Initial Forced Entry	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Decisive Operations	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Stability / Reconstruction	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)

Force Protection Planner

	Political CoGs	Military CoGs	Economic CoGs	Social CoGs	Information CoGs	Infrastructure CoGs
Set Conditions	Low (0.2-0.4)	High (0.8-1.0)*	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Medium (0.5-0.7)*
Initial Forced Entry	Low (0.2-0.4)	High (0.8-1.0)*	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Medium (0.5-0.7)*
Decisive Operations	Low (0.2-0.4)	High (0.8-1.0)*	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Medium (0.5-0.7)*
Stability / Reconstruction	Low (0.2-0.4)	High (0.8-1.0)*	Medium (0.5-0.7)*	Low (0.2-0.4)	Low (0.2-0.4)	Medium (0.5-0.7)*

*Note: Expertise in the military area addresses only knowledge elements related to the protection of facilities

Deployment Planner

	Political CoGs	Military CoGs	Economic CoGs	Social CoGs	Information CoGs	Infrastructure CoGs
Set Conditions	Low (0.2-0.4)	High (0.8-1.0)*	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Initial Forced Entry	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Decisive Operations	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Stability / Reconstruction	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)

*Note: Expertise in the military area addresses only knowledge elements related to the deployment of BLUE forces

TASK 2-1 IDENTIFY PMESII FUNCTIONAL ELEMENTS

Task Description

Task 2-1 continues the construction of focal knowledge within the simulated JTF planning rhythm. The task produces the third level of decomposition of the desired *Centers of Gravity* into a set of *PMESII Functional Elements* for each phase of the operational campaign.

Task Participation

Task 2-1 is led by the core *Joint Planning Group* (JPG) that is nominally comprised of the following primary actors:

- JTF Commander
- Deputy JTF Commander
- Information Operations Officer
- JTF Plans Chief
- Ground (Army) Planner
- Ground (Marines) Planner
- Air Planner
- Maritime Planner
- Special Operations Planner
- Political/Military Planner

The primary actors engage in an initial execution of Task 2-1. If the number of identified *PMESII Functional Elements* reaches the set threshold level specified in the model, the task is considered completed—otherwise, the task is re-executed after supporting the core JPG with secondary actors. Secondary actors supporting the core JPG include

- STO Planner
- Operations Law Planner
- Red/Blue Planner
- Force Protection Planner
- Deployment Planner

Area and Level of Staff Expertise

The following set of tables indicate the areas and levels of knowledge characterizing each of the actors listed as participating in Task 2-1.

JTF Commander

	Political FEs	Military FEs	Economic FEs	Social FEs	Information FEs	Infrastructure FEs
Set Conditions	High (0.8-1.0)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	High (0.8-1.0)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	High (0.8-1.0)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)

Deputy JTF Commander

	Political FEs	Military FEs	Economic FEs	Social FEs	Information FEs	Infrastructure FEs
Set Conditions	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)

Information Operations Officer

	Political FEs	Military FEs	Economic FEs	Social FEs	Information FEs	Infrastructure FEs
Set Conditions	Low (0.2-0.4)	Low (0.2-0.4)	Nil (0.0)	Low (0.2-0.4)	High (0.8-1.0)	Nil (0.0)
Initial Forced Entry	Low (0.2-0.4)	Low (0.2-0.4)	Nil (0.0)	Low (0.2-0.4)	High (0.8-1.0)	Nil (0.0)
Decisive Operations	Low (0.2-0.4)	Low (0.2-0.4)	Nil (0.0)	Low (0.2-0.4)	High (0.8-1.0)	Nil (0.0)
Stability / Reconstruction	Low (0.2-0.4)	Low (0.2-0.4)	Nil (0.0)	Low (0.2-0.4)	High (0.8-1.0)	Nil (0.0)

JTF Plans Chief

	Political FEs	Military FEs	Economic FEs	Social FEs	Information FEs	Infrastructure FEs
Set Conditions	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)

Ground (Army) Planner

	Political FEs	Military FEs	Economic FEs	Social FEs	Information FEs	Infrastructure FEs
Set Conditions	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)
Initial Forced Entry	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)
Decisive Operations	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)
Stability / Reconstruction	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)

Ground (Marines) Planner

	Political FEs	Military FEs	Economic FEs	Social FEs	Information FEs	Infrastructure FEs
Set Conditions	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)
Initial Forced Entry	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)
Decisive Operations	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)
Stability / Reconstruction	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)

Air Planne:

	Political FEs	Military FEs	Economic FEs	Social FEs	Information FEs	Infrastructure FEs
Set Conditions	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Nil (0.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)

Maritime Planner

	Political FEs	Military FEs	Economic FEs	Social FEs	Information FEs	Infrastructure FEs
Set Conditions	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Nil (0.0)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Nil (0.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)

Special Operations Planner

	Political FEs	Military FEs	Economic FEs	Social FEs	Information FEs	Infrastructure FEs
Set Conditions	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	High (0.8-1.0)	High (0.8-1.0)	Medium (0.5-0.7)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)

Political/Military Planner

	Political FEs	Military FEs	Economic FEs	Social FEs	Information FEs	Infrastructure FEs
Set Conditions	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	High (0.8-1.0)	Medium (0.5-0.7)	Low (0.2-0.4)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)

STO Planner

	Political FEs	Military FEs	Economic FEs	Social FEs	Information FEs	Infrastructure FEs
Set Conditions	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)	High (0.8-1.0)

Operations: Law Planner

	Political FEs	Military FEs	Economic FEs	Social FEs	Information FEs	Infrastructure FEs
Set Conditions	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)

Red/Blue Planner

	Political FEs	Military FEs	Economic FEs	Social FEs	Information FEs	Infrastructure FEs
Set Conditions	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Initial Forced Entry	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Decisive Operations	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Stability / Reconstruction	Low (0.2-0.4)	High (0.8-1.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)

Force Protection Planner

	Political FEs	Military FEs	Economic FEs	Social FEs	Information FEs	Infrastructure FEs
Set Conditions	Low (0.2-0.4)	High (0.8-1.0)*	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Medium (0.5-0.7)*
Initial Forced Entry	Low (0.2-0.4)	High (0.8-1.0)*	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Medium (0.5-0.7)*
Decisive Operations	Low (0.2-0.4)	High (0.8-1.0)*	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Medium (0.5-0.7)*
Stability / Reconstruction	Low (0.2-0.4)	High (0.8-1.0)*	Medium (0.5-0.7)*	Low (0.2-0.4)	Low (0.2-0.4)	Medium (0.5-0.7)*

*Note: Expertise in the military area addresses only knowledge elements related to the protection of facilities

Deployment Planner

	Political FEs	Military FEs	Economic FEs	Social FEs	Information FEs	Infrastructure FEs
Set Conditions	Low (0.2-0.4)	High (0.8-1.0)*	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Initial Forced Entry	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Decisive Operations	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Stability / Reconstruction	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)

*Note: Expertise in the military area addresses only knowledge elements related to the deployment of BLUE forces

TASK 3-1 IDENTIFY NODE MISSION PACKAGE CLASSES

Task Description

Task 3-1 continues the construction of focal knowledge within the simulated JTF planning rhythm. The task produces the final level of decomposition of the desired *PMESII Functional Elements* into a set of *Node Mission Package Classes* for each phase of the operational campaign.

Task Participation

Task 3-1 is led by the *Joint Fires and Effects Working Group* (JFEWG) that is nominally comprised of the following primary actors:

- Effects Assessment Supervisor
- Information Officer Supervisor
- Political/Military Planner
- Red/Blue Planner
- Land Operations Officer
- Air Operations Officer
- Maritime Operations Officer
- Special Operations Officer
- Ground Weaponeer/Targeteer
- Air Weaponeer/Targeteer
- Maritime Weaponeer/Targeteer
- Special Operations Weaponeer/Targeteer

The primary actors engage in an initial execution of Task 3-1. If the number of identified *Node Mission Package Classes* reaches the set threshold level specified in the model, the task is considered completed –otherwise, the task is re-executed after supporting the JFEWG with secondary actors. Secondary actors supporting the JFEWG include

- Operational Net Assessment (ONA) Supervisor
- ONA Effects Analyst
- ONA Network Analyst
- ONA System-of-Systems Analyst (SOSA) – Political
- ONA SOSA – Military
- ONA SOSA – Economic
- ONA SOSA – Social
- ONA SOSA – Information
- ONA SOSA – Infrastructure
- Operations Law Planner
- Force Protection Planner
- Reach-Back Expertise – Political
- Reach-Back Expertise – Military
- Reach-Back Expertise – Economic
- Reach-Back Expertise – Social

- Reach-Back Expertise – Information
- Reach-Back Expertise – Infrastructure

Area and Level of Staff Expertise

The following set of tables indicate the areas and levels of knowledge characterizing each of the actors listed as participating in Task 3-1.

Effects Assessment Supervisor

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)

Information Operations Supervisor

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Low (0.2-0.4)	Low (0.2-0.4)	Nil (0.0)	Low (0.2-0.4)	Medium (0.5-0.7)	Nil (0.0)
Initial Forced Entry	Low (0.2-0.4)	Low (0.2-0.4)	Nil (0.0)	Low (0.2-0.4)	Medium (0.5-0.7)	Nil (0.0)
Decisive Operations	Low (0.2-0.4)	Low (0.2-0.4)	Nil (0.0)	Low (0.2-0.4)	Medium (0.5-0.7)	Nil (0.0)
Stability / Reconstruction	Low (0.2-0.4)	Low (0.2-0.4)	Nil (0.0)	Low (0.2-0.4)	Medium (0.5-0.7)	Nil (0.0)

Political/Military Planner

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Medium (0.5-0.7)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Medium (0.5-0.7)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Medium (0.5-0.7)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Medium (0.5-0.7)	Medium (0.5-0.7)	Low (0.2-0.4)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)

Red/Blue Planner

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Low (0.2-0.4)	Medium (0.5-0.7)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Initial Forced Entry	Low (0.2-0.4)	Medium (0.5-0.7)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Decisive Operations	Low (0.2-0.4)	Medium (0.5-0.7)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)
Stability / Reconstruction	Low (0.2-0.4)	Medium (0.5-0.7)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)

Ground Operations Officer

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)

Air Operations Officer

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Nil (0.0)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)

Maritime Operations Officer

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Nil (0.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Nil (0.0)	Medium (0.5-0.7)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)

Special Operations Officer

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)

Ground Waponeer/Targeteer

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	High (0.8-1.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	High (0.8-1.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	High (0.8-1.0)	Nil (0.0)
Stability / Reconstruction	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)

Air Weaponeer/Targeteer

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)

Maritime Weaponeer/Targeteer

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)

Special Weaponeer/Targeteer

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Medium (0.5-0.7)	High (0.8-1.0)	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	Medium (0.5-0.7)	High (0.8-1.0)	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)	Nil (0.0)
Decisive Operations	Medium (0.5-0.7)	Medium (0.5-0.7)	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)

ONA Supervisor

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)

ONA Effects Analyst

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)
Initial Forced Entry	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)
Decisive Operations	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)
Stability / Reconstruction	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)

ONA Network Analyst

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)
Initial Forced Entry	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)
Decisive Operations	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)	High (0.8-1.0)	Medium (0.5-0.7)	Medium (0.5-0.7)
Stability / Reconstruction	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)

ONA SOSA – Political

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Decisive Operations	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	Medium (0.5-0.7)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)

ONA SOSA – Military

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)

ONA SOSA – Economic

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	Nil (0.0)	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)	Nil (0.0)	Nil (0.0)

ONA SOSA – Social

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	Nil (0.0)	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	Nil (0.0)	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	Nil (0.0)	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	Nil (0.0)	Nil (0.0)	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)	Nil (0.0)

ONA SOSA – Information

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	High (0.8-1.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	High (0.8-1.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	High (0.8-1.0)	Nil (0.0)
Stability / Reconstruction	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)

ONA SOSA – Infrastructure

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	High (0.8-1.0)
Initial Forced Entry	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	High (0.8-1.0)
Decisive Operations	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	High (0.8-1.0)
Stability / Reconstruction	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Medium (0.5-0.7)

Operations Law Planner

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	Medium (0.5-0.7)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)	Medium (0.5-0.7)

Force Protection Planner

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Low (0.2-0.4)	High (0.8-1.0)*	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Medium (0.5-0.7)*
Initial Forced Entry	Low (0.2-0.4)	High (0.8-1.0)*	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Medium (0.5-0.7)*
Decisive Operations	Low (0.2-0.4)	High (0.8-1.0)*	Low (0.2-0.4)	Low (0.2-0.4)	Low (0.2-0.4)	Medium (0.5-0.7)*
Stability / Reconstruction	Low (0.2-0.4)	High (0.8-1.0)*	Medium (0.5-0.7)*	Low (0.2-0.4)	Low (0.2-0.4)	Medium (0.5-0.7)*

*Note: Expertise in the military area addresses only knowledge elements related to the protection of facilities

ONA SOSA – Political

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)

ONA SOSA – Military

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)

ONA SOSA – Economic

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	Nil (0.0)	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)

ONA SOSA – Social

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	Nil (0.0)	Nil (0.0)	Nil (0.0)	High (0.8-1.0)	Nil (0.0)	Nil (0.0)

ONA SOSA – Information

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	High (0.8-1.0)	Nil (0.0)

ONA SOSA – Infrastructure

	Political NMPs	Military NMPs	Economic NMPs	Social NMPs	Information NMPs	Infrastructure NMPs
Set Conditions	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Initial Forced Entry	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Decisive Operations	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)
Stability / Reconstruction	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	Nil (0.0)	High (0.8-1.0)

CLASSIFICATION OF KNOWLEDGE ELEMENTS

Each simulated staff actor within the model is characterized in terms of their areas and levels of expertise across the different PMESII dimensions of the battlespace. In order to match this expertise with the specific knowledge elements in the operational scenario, one must first specify the PMESII dimension associated with each knowledge element –e.g., Strategic Endstate, Center of Gravity, etc. It is recognized that some knowledge elements will reflect a combination of two or more PMESII dimensions –e.g., a knowledge element might reflect a battlespace entity that requires both political and social expertise for its recognition. However, in order to simplify the modeling logic, it is assumed that each knowledge element will reflect a key PMESII dimension—i.e., the dimension of expertise thought to be most critical to its recognition—even though it might involve other PMESII dimensions to a lesser extent. The following tables provide a baseline designation for each of the knowledge elements across the four levels phases of the operational scenario and across the four levels of knowledge decomposition.

Phase 1 – Setting Conditions for Success

Strategic Endstates

NCA Objective	Strategic Endstate	Key Dimension
Shape Battlespace	Air/Sea Superiority	Military
	Persistent ISR	Military
	Insurgency Alignment	Military
	Capitulation / Neutrality	Political
	Population Support	Social
	Initial Deployment	Military
Regional Diplomacy	Host Nation Agreements	Political
	Neutrality Agreements	Political

Centers of Gravity

Strategic Endstate	Center of Gravity	Key Dimension
Air/Sea Superiority	Adversary Airpower Systems	Military
	Adversary Seapower Systems	Military
Persistent ISR	Key Areas of Interest	Military
Insurgency Alignment	Internal Insurgency Forces	Military
Capitulation / Neutrality	Key Administrative / Military Officials	Political
Population Support	Civilian Population	Social
Initial Deployment	US / Coalition Forces	Military
Host Nation Agreements	Country Green	Political
Neutrality Agreements	Country Orange	Political

PMESII Functional Elements

Center of Gravity	PMESII Functional Element	Key Dimension
Adversary Airpower Systems	Fighter/Interceptors	Military
	Military/Civilian Airfields	Military
	Airfield Support Facilities	Military
	EW Radar Networks	Military
	GCI Radar Networks	Military
	SAM Control Radars	Military
	SAM Batteries	Military
Adversary Seapower Systems	Naval Combatant Ships	Military
	Submarines	Military
	Littoral Patrol Boats	Military
	Military Seaport Docks	Military
	Seaport Support Facilities	Military
	Paramilitary Sea Threat	Military
	Sea Mine Clearance Areas	Military
Key Areas of Interest	Regime Leader Residence	Military
	Political Party Facilities	Political
	Political C ² Network	Political
	Regime Financial Network	Economic
	WMD Delivery Systems	Military
	WMD Stockpiles	Military
	Red Military Installations	Military
	Red Staging Areas	Military
	Red Defensive Positions	Military
	Red Approach Routes	Military
	Paramilitary Stockpiles	Military
	Paramilitary Units	Military
	Paramilitary Vehicles	Military
	Terrorist Training Camps	Military
	Border Infiltration Routes	Military
	Ethnic Populations	Social
	Refugees/Resettlements	Social
	Key Geographic Areas	Social
	Regional Media Outlets	Information
	Natural Resource Facilities	Economic
Resource Infrastructure	Infrastructure	
Technical Workers	Economic	
Internal Insurgency Forces	Regional Insurgency Cells	Military
	Insurgency Leadership	Military
Key Admin/Mil Officials	Democratic Leadership	Political
	Local Admin Leaders	Political
	Key Utility Managers	Infrastructure
	Military Leaders	Military
Civilian Population	Religious Leaders	Social
	Local Tribal Leaders	Social
	Key Ethnic Populations	Social
US/Coalition Forces	Airmobile Assault Forces	Military
	Amphibious Assault Forces	Military
	Deception Forces	Military
Country Green	Green Minister of Defense	Political
	Green Minister of Interior	Political
	Green Military Commanders	Military
Country Orange	Orange Minister of Defense	Political
	Orange Minister of Interior	Political
	Orange Military Commanders	Military

Node Mission Package Classes

PMESII Functional Element	Node Mission Package Class	Key Dimension
Fighter/Interceptors	Fighter Aircraft Squadron	Military
Military/Civilian Airfields	Military Airfield Runway	Military
	Civilian Airfield Runway	Military
Airfield Support Facilities	Fuel Storage Facility	Military
EW Radar Networks	EW Radar Complex	Military
GCI Radar Networks	SAM Control Center	Military
SAM Control Radars	SAM Control Radar Site	Military
SAM Batteries	SAM Launcher Battery	Military
Naval Combatant Ships	Naval Ship Group	Military
Submarines	Submarine	Military
Littoral Patrol Boats	Patrol Boat Group	Military
Military Seaport Docks	Military Dock Complex	Military
Seaport Support Facilities	Sea Support Facility	Military
Paramilitary Sea Threat	Paramilitary Boat Group	Military
Sea Mine Clearance Areas	Sea Mine Area	Military
Regime Leader Residence	Regime Residence/Bunker	Military
Political Party Facilities	Political Party Headquarters	Political
	Local Party Office	Political
Political C ² Network	Political C ² Node	Political
	Alternate Political C ² Node	Political
Regime Financial Network	National Financial Net	Economic
WMD Delivery Systems	WMD TEL Battery	Military
WMD Stockpiles	WMD Storage Facility	Military
Red Military Installations	Military Garrison	Military
Red Staging Areas	Military Staging Area	Military
Red Defensive Positions	Defensive Fortification	Military
Red Approach Routes	Key LOC Route	Military
Paramilitary Stockpiles	Weapons Cache	Military
Paramilitary Units	Paramilitary Cell	Military
Paramilitary Vehicles	Paramilitary Vehicle Group	Military
Terrorist Training Camps	Training Camp Area	Military
Border Infiltration Routes	Infiltration Route	Military
Ethnic Populations	Ethnic Neighborhood	Social
Refugees/Resettlements	Refugee Camp	Social
Key Geographic Areas	Key Urban Area	Social
Regional Media Outlets	TV/Radio/Newspaper Media	Information
Natural Resource Facilities	Oilfield/Processing Complex	Economic
	Key Agriculture Area	Economic
Resource Infrastructure	Oil/Gas Pipeline	Infrastructure
Technical Workers	Key Worker Group	Economic
Regional Insurgency Cells	Insurgency Cell	Military
Insurgency Leadership	Key Insurgency Leader	Military
Democratic Leadership	Key Parliament Official	Political
Local Admin Leaders	City/Town Mayor	Political
Key Utility Managers	City Utility Manager	Infrastructure
Military Leaders	Military Commander	Military
Religious Leaders	Key Cleric Official	Political
Local Tribal Leaders	Key Tribal Warlord	Political
Key Ethnic Populations	Key Ethnic Region	Political
Airmobile Assault Forces	Blue Airmobile Unit	Military
Amphibious Assault Forces	Blue Marine Unit	Military
Deception Forces	Blue Ground Unit	Military
Green Minister of Defense	Overflight Agreement	Political
Green Minister of Interior	Transit Agreement	Political
	Staging Area Agreement	Political
Green Military Commanders	Forces Agreement	Military
Orange Minister of Defense	Political Neutrality Agreement	Political

Orange Minister of Interior	Anti-Sanctuary Agreement	Political
Orange Military Commanders	Mil Neutrality Agreement	Military

Phase 2 – Initial Forced Entry

Strategic Endstates

NCA Objective	Strategic Endstate	Key Dimension
Conduct Deception Campaign	Fix Adversary Forces	Military
Conduct Initial Forced Entry	Air/Sea Superiority	Military
	Persistent ISR	Military
	Eliminate WMD Threat	Military
	Degrade Regime Leadership	Military
	Conduct Amphibious Assault	Military
	Conduct Airmobile Assault	Military
	Build Insurgency Axis	Military
Set Conditions for Stability & Reconstruction	Key Leader Capitulation	Political
	Build Population Support	Social
	Build Humanitarian Base	Military
	Protect National Resources	Military
	Protect Minority Population	Military

Centers of Gravity

Strategic Endstate	Center of Gravity	Key Dimension
Fix Adversary Forces	Eastern Surveillance	Military
	Eastern Combat Divisions	Military
	Eastern Advance Routes	Military
Air/Sea Superiority	Adversary Airpower Systems	Military
	Adversary Seapower Systems	Military
Persistent ISR	Key Areas of Interest	Military
Eliminate WMD Threat	WMD Stockpiles / Delivery Sys	Military
Degrade Regime Leadership	Top Regime Leadership	Military
Conduct Amphibious Assault	Western Border Defenses	Military
	Western Security Forces	Military
	Western Paramilitary	Military
Conduct Airmobile Assault	Key Airfield Defenses	Military
	Southern Paramilitary	Military
Build Insurgency Axis	Capital Area Paramilitary	Military
Key Leader Capitulation	Western / Southern Leaders	Political
Build Population Support	Cultural / Religious Support	Social
	Key Traffic Routes	Social
Build Humanitarian Base	Country Green Staging Areas	Military
Protect National Resources	Resource Infrastructure	Military
Protect Minority Population	Ethnic Neighborhoods	Military

PMESII Functional Elements

Center of Gravity	PMESII Functional Element	Key Dimension
Eastern Surveillance	Long Range Surveillance	Military
	Tactical Reconnaissance	Military
Eastern Combat Divisions	Assembly Areas / Defensive Positions	Military
Eastern Advance Routes	Border Civilian Population	Military
Adversary Airpower Systems	Fighter/Interceptors	Military
	Military / Civilian Airfields	Military
	Airfield Support Facilities	Military
	EW Radar Networks	Military
	GCI Radar Networks	Military
	SAM Control Radars	Military

	SAM Batteries	Military
Adversary Seapower Systems	Naval Combatant Ships	Military
	Submarines	Military
	Littoral Patrol Boats	Military
	Military Seaport Docks	Military
	Seaport Support Facilities	Military
	Paramilitary Sea Threat	Military
	Sea Mine Clearance Areas	Military
Key Areas of Interest	Red Military Installations	Military
	Red Staging Areas	Military
	Red Defensive Positions	Military
	Red Approach Routes	Military
	Paramilitary Stockpiles	Military
	Paramilitary Units	Military
	Paramilitary Vehicles	Military
	Terrorist Training Camps	Military
WMD Stockpiles / Delivery Sys	Border Infiltration Routes	Military
	WMD Delivery Systems	Military
Top Regime Leadership	WMD Stockpiles	Military
	Regime Leader Residence	Military
	Political Party Facilities	Political
	Political C ² Network	Political
Western Border Defenses	Regime Financial Network	Economic
	Physical Defenses	Military
Western Security Forces	Conscript Military Units	Military
Western Paramilitary	West Paramilitary Stockpiles	Military
	West Paramilitary Units	Military
	West Paramilitary Vehicles	Military
Key Airfield Defenses	Elite Security Units	Military
Southern Paramilitary	South Paramilitary Stockpiles	Military
	South Paramilitary Units	Military
	South Paramilitary Vehicles	Military
Capital Area Paramilitary	Capital Paramilitary Stockpiles	Military
	Capital Paramilitary Units	Military
	Capital Paramilitary Vehicles	Military
Western / Southern Leaders	Ministry/Parliament Leaders	Political
	City/Town Mayors	Political
	City/Town Utility Managers	Infrastructure
	Military Commanders	Military
Cultural / Religious Support	Key Religious Leaders	Social
	Clan/Tribal Leaders	Social
Key Traffic Routes	Key Route Population	Social
Country Green Staging Areas	Humanitarian Stockpiles	Military
	Staging Areas	Military
Resource Infrastructure	Oil / Mine / Agriculture Facilities	Economic
	Pipelines / Transport Sys	Infrastructure
	Technician / Worker Groups	Economic
	Paramilitary Units	Military
	Paramilitary Vehicles	Military
Ethnic Neighborhoods	Paramilitary Units	Military
	Paramilitary Vehicles	Military

Node Mission Package Classes

PMESII Functional Element	Node Mission Package Class	Key Dimension
Long Range Surveillance	Long Range Surveillance Site	Military
Tactical Reconnaissance	Tactical Reconnaissance Site	Military
Assembly Areas / Defensive Positions	Ground Combat Division	Military
Border Civilian Population	Border Route Civilian Area	Military
Fighter/Interceptors	Fighter Aircraft Squadron	Military

Military / Civilian Airfields	Military Airfield Runway	Military
	Civilian Airfield Runway	Military
Airfield Support Facilities	Fuel Storage Facility	Military
EW Radar Networks	EW Radar Complex	Military
GCI Radar Networks	SAM Control Center	Military
SAM Control Radars	SAM Control Radar Site	Military
SAM Batteries	SAM Launcher Battery	Military
Naval Combatant Ships	Naval Ship Group	Military
Submarines	Submarine	Military
Littoral Patrol Boats	Patrol Boat Group	Military
Military Seaport Docks	Military Dock Complex	Military
Seaport Support Facilities	Sea Support Facility	Military
Paramilitary Sea Threat	Paramilitary Boat Group	Military
Sea Mine Clearance Areas	Sea Mine Area	Military
Red Military Installations	Military Garrison	Military
Red Staging Areas	Military Staging Area	Military
Red Defensive Positions	Defensive Fortification	Military
Red Approach Routes	Key LOC Route	Military
Paramilitary Stockpiles	Weapons Cache	Military
Paramilitary Units	Paramilitary Cell	Military
Paramilitary Vehicles	Paramilitary Vehicle Group	Military
Terrorist Training Camps	Training Camp Area	Military
Border Infiltration Routes	Infiltration Route	Military
WMD Delivery Systems	WMD TEL Battery	Military
WMD Stockpiles	WMD Storage Facility	Military
Regime Leader Residence	Regime Residence / Bunker	Military
Political Party Facilities	Political Party Headquarters	Political
	Local Party Office	Political
Political C ² Network	Political C ² Node	Military
	Alternate Political C ² Node	Military
Regime Financial Network	National Financial Net	Economic
Physical Defenses	Physical Impediments	Military
Conscript Military Units	Military Conscript Company	Military
West Paramilitary Stockpiles	Weapons Cache	Military
West Paramilitary Units	Paramilitary Cell	Military
West Paramilitary Vehicles	Paramilitary Vehicle Group	Military
Elite Security Units	Elite Security Company	Military
South Paramilitary Stockpiles	Weapons Cache	Military
South Paramilitary Units	Paramilitary Cell	Military
South Paramilitary Vehicles	Paramilitary Vehicle Group	Military
Capital Paramilitary Stockpiles	Weapons Cache	Military
Capital Paramilitary Units	Paramilitary Cell	Military
Capital Paramilitary Vehicles	Paramilitary Vehicle Group	Military
Ministry/Parliament Leaders	Ministry/Parliament Leader	Political
City/Town Mayors	City/Town Mayor	Political
City/Town Utility Managers	City/Town Utility Manager	Infrastructure
Military Commanders	Military Commander	Military
Key Religious Leaders	Key Cleric or Religious Leader	Social
Clan/Tribal Leaders	Clan Chief / Warlord	Social
Key Route Population	Local Route Neighborhood	Social
Humanitarian Stockpiles	Relief Supply Load	Military
Staging Areas	Staging Site	Military
Oil / Mine / Agriculture Facilities	Oilfield, Mine or Crop Field	Economic
Pipelines / Transport Sys	Pipeline or Trans Facility	Infrastructure
Technician / Worker Groups	Local Technician Group	Economic
Paramilitary Units	Paramilitary Cell	Military
Paramilitary Vehicles	Paramilitary Vehicle Group	Military
Paramilitary Units	Paramilitary Cell	Military
Paramilitary Vehicles	Paramilitary Vehicle Group	Military

Phase 3 – Decisive Operations

Strategic Endstates

NCA Objective	Strategic Endstate	Key Dimension
Eliminate WMD Capability	WMD Under Positive Control	Military
Eliminate Regime Power	Regime Leaders Neutralized	Military
	Regime Party Neutralized	Military
Neutralize Combat Divisions	Divisions Capitulate / Destroyed	Military
Secure Natural Resources	Protect National Resources	Military
Protect / Sustain Civilians	Keep Population in Homes	Social
	Humanitarian Relief	Military
	Protect Minority Population	Military
Establish Law and Order	Destroy Terrorist Base	Military
	Stop Foreign Infiltrators	Military
	Apprehend Criminals	Military
Protect Coalition Logistics	Protect Convoys / Assembly Areas	Military

Centers of Gravity

Strategic Endstate	Center of Gravity	Key Dimension
WMD Under Positive Control	WMD Stockpiles / Delivery	Military
	WMD Labs / Production	Military
Regime Leaders Neutralized	Key Regime Leaders	Military
Regime Party Neutralized	Political / Financial Networks	Military
	Capital Area Paramilitary	Military
Divisions Capitulate / Destroyed	Capitulating Divisions	Military
	Resisting Divisions	Military
Protect National Resources	Resource Infrastructure	Military
Keep Population in Homes	Key Population Leaders	Social
	Civilian Refuge Traffic	Social
Humanitarian Relief	Distribution Relief Areas	Military
Protect Minority Population	Ethnic Neighborhoods	Military
Destroy Terrorist Base	Terrorist Operations	Military
Stop Foreign Infiltrators	Foreign Infiltration Cells	Military
Apprehend Criminals	Criminal Networks	Military
Protect Convoys / Assembly Areas	Coalition Supply Convoys	Military
	Coalition Assembly Areas	Military

PMESII Functional Elements

Center of Gravity	PMESII Functional Element	Key Dimension
WMD Stockpiles / Delivery	WMD Transporter/Erector/Launchers	Military
	WMD Storage / Assembly	Military
WMD Labs / Production	WMD Research Labs / Plants	Military
Key Regime Leaders	Key Regime Leaders	Military
	Regime Residences / Bunkers	Military
Political / Financial Networks	Political Party Facilities	Political
	Regime Financial Networks	Economic
Capital Area Paramilitary	Paramilitary Cells	Military
Capitulating Divisions	Division Leadership	Military
	Division Equipment	Military
	Division Troops	Military
	Disrupting Paramilitary Units	Military
	Disrupting Paramilitary Vehicles	Military
Resisting Divisions	Division Leadership	Military
	Division Equipment	Military
	Division Troops	Military
Resource Infrastructure	Oil / Mine / Agriculture Facilities	Economic
	Pipelines / Transport Sys	Infrastructure
	Technician / Worker Groups	Economic

	Paramilitary Units	Military
	Paramilitary Vehicles	Military
Key Population Leaders	Cultural / Religious Leaders	Social
	Clan/Tribal Leaders	Social
Civilian Refuge Traffic	Key Route Population	Social
Distribution Relief Areas	Relief Supplies	Military
	Distribution Sites	Military
	Paramilitary Units	Military
	Paramilitary Vehicles	Military
Ethnic Neighborhoods	Paramilitary Units	Military
	Paramilitary Vehicles	Military
Terrorist Operations	Training Camps	Military
	Terrorist Bunkers	Military
	Terrorist Personnel	Military
Foreign Infiltration Cells	Terrorist Personnel	Military
Criminal Networks	Criminal Personnel	Military
Coalition Supply Convoys	Convoy Security	Military
	Paramilitary Units	Military
	Paramilitary Vehicles	Military
	Terrorist Cells	Military
Coalition Assembly Areas	Assembly Area Security	Military
	Paramilitary Units	Military
	Paramilitary Vehicles	Military
	Terrorist Cells	Military

Node Mission Package Classes

PMESII Functional Element	Node Mission Package Class	Key Dimension
WMD Transported/Erector/Launchers	WMD Transporter/Erector/Launcher Battery	Military
WMD Storage / Assembly	WMD Storage Facility	Military
WMD Research Labs / Plants	WMD Lab or Plant	Military
Key Regime Leaders	Regime Official	Military
Regime Residences / Bunkers	Residence or Bunker	Military
Political Party Facilities	Political Party Headquarters	Political
	Local Party Office	Political
Regime Financial Networks	National Financial Net	Economic
Paramilitary Cells	Paramilitary Cell	Military
Division Leadership	Division Commander	Military
Division Equipment	Vehicle Assembly Area	Military
Division Troops	Local Area Troops	Military
Disrupting Paramilitary Units	Paramilitary Cell	Military
Disrupting Paramilitary Vehicles	Paramilitary Vehicle Group	Military
Division Leadership	Division Leaders	Military
Division Equipment	Combat Vehicle Group	Military
	Support Vehicle Group	Military
Division Troops	Combat Company	Military
Oil / Mine / Agriculture Facilities	Oilfield, Mine or Crop Field	Economic
Pipelines / Transport Sys	Pipeline or Trans Facility	Infrastructure
Technician / Worker Groups	Local Technician Group	Economic
Paramilitary Units	Paramilitary Cell	Military
Paramilitary Vehicles	Paramilitary Vehicle Group	Military
Cultural / Religious Leaders	Key Cleric or Religious Leader	Social
Clan/Tribal Leaders	Clan Chief / Warlord	Social
Key Route Population	Local Route Neighborhood	Social
Relief Supplies	Relief Supply Load	Military
Distribution Sites	Distribution Site	Military
Paramilitary Units	Paramilitary Cell	Military
Paramilitary Vehicles	Paramilitary Vehicle Group	Military
Paramilitary Units	Paramilitary Cell	Military
Paramilitary Vehicles	Paramilitary Vehicle Group	Military

Training Camps	Training Facility	Military
Terrorist Bunkers	Bunker Complex	Military
Terrorist Personnel	Terrorist Cell	Military
Terrorist Personnel	Terrorist Cell	Military
Criminal Personnel	Criminal Cell	Military
Convoy Security	Convoy Overwatch Route	Military
Paramilitary Units	Paramilitary Cell	Military
Paramilitary Vehicles	Paramilitary Vehicle Group	Military
Terrorist Cells	Terrorist Cells	Military
Assembly Area Security	Assembly Area Perimeter	Military
Paramilitary Units	Paramilitary Cell	Military
Paramilitary Vehicles	Paramilitary Vehicle Group	Military
Terrorist Cells	Terrorist Cell	Military

Phase 4 – Stability and Reconstruction

Strategic Endstates

NCA Objective	Strategic Endstate	Key Dimension
Defeat Violent Spoilers	Isolate / Defeat Spoilers	Military
Co-opt Nonviolent Spoilers	Restrain Disruption Agents	Political
Establish Next State Conditions	Civil Law and Order	Infrastructure
	Public Infrastructure	Infrastructure
	Public Health Services	Infrastructure
	Internal Security Forces	Military
International Support	Economic Development Aid	Economic
	PVO/NGO Synchronization	Political

Centers of Gravity

Strategic Endstate	Center of Gravity	Key Dimension
Isolate / Defeat Spoilers	Neighborhood Intelligence	Military
	Operating Spoiler Cells	Military
	Insurgency Attack Cells	Military
Restrain Disruption Agents	Ethnic Communication	Political
	Spoiler Organizations	Political
	Major Disruption Sites	Military
Civil Law and Order	Civil Administration	Infrastructure
	National Police Force	Military
Public Infrastructure	Electricity / Water / Sewage	Infrastructure
	Information Networks	Infrastructure
	Public Education	Infrastructure
	Transportation Networks	Infrastructure
Public Health Services	Public Health Systems	Infrastructure
Internal Security Forces	National Military Forces	Military
Economic Development Aid	Key Economic Sectors	Economic
PVO/NGO Synchronization	PVO / NGO Organizations	Political

PMESII Functional Elements

Center of Gravity	PMESII Functional Element	Key Dimension
Neighborhood Intelligence	Ethnic Leader Cooperation	Military
	Media Outlets	Information
Operating Spoiler Cells	Terrorist Leadership	Military
	Terrorist Cells	Military
	Terrorist Weapons Cache	Military
	Terrorist Support Networks	Military
Insurgency Attack Cells	IED Consequence Management	Military
	Civil Population Support	Social
	Media Outlets	Information

Ethnic Communication	Community Leader Dialog	Political
	Media Outlets	Information
Spoiler Organizations	Spoiler Org Leadership	Political
	Spoiler Org Agents	Military
	Spoiler Org Followers	Social
	Media Outlets	Information
Major Disruption Sites	Protest Consequence Management	Military
	Civil Population Support	Social
	Media Outlets	Information
Civil Administration	Civil Administrative Functions	Infrastructure
	National/Local Elections	Military
	Media Outlets	Information
	Admin Office Security	Military
National Police Force	Recruit Police Personnel	Military
	Police Training Program	Military
	Media Outlets	Information
Electricity / Water / Sewage	Electric Power Networks	Infrastructure
	Water / Sewage Treatment	Infrastructure
	Media Outlets	Information
	Utility Systems Security	Military
Information Networks	Telephone / Internet Grid	Infrastructure
	Broadcast Media Centers	Infrastructure
	Media Outlets	Information
	Communications Security	Military
Public Education	Local School Facilities	Infrastructure
	Media Outlets	Information
Transportation Networks	Key Bridges	Infrastructure
	Key Roadways	Infrastructure
	Key Rail Lines	Infrastructure
	Media Outlets	Information
	Transport System Security	Military
Public Health Systems	Hospitals / Clinics	Infrastructure
	Medical Stockpiles	Infrastructure
	Media Outlets	Information
National Military Forces	Key Military Leadership	Military
	NCO / Enlisted Personnel	Military
	Military Training Program	Military
	Military Equipment	Military
	Media Outlets	Information
Key Economic Sectors	Economic Aid Agreements	Economic
	Econ Development Projects	Economic
	Contractor Protection	Economic
	Media Outlets	Information
PVO / NGO Organizations	PVO/NGO Projects	Political
	PVO/NGO Protection	Military
	Media Outlets	Information

Node Mission Package Classes

PMESII Functional Element	Node Mission Package Class	Key Dimension
Ethnic Leader Cooperation	Local Community Leader	Military
Media Outlets	TV/Radio/Newspaper Office	Information
Terrorist Leadership	Terrorist Cell Leader	Military
Terrorist Cells	Terrorist Cell	Military
Terrorist Weapons Cache	Weapons Cache	Military
Terrorist Support Networks	Support Network	Military
IED Consequence Management	Medical Injury Site	Military
	Facility Damage Site	Infrastructure
Civil Population Support	Local Neighborhood	Social
Media Outlets	TV/Radio/Newspaper Office	Information

Community Leader Dialog	Local Community Leader	Political
Media Outlets	TV/Radio/Newspaper Office	Information
Spoiler Org Leadership	Spoiler Org Leader	Political
Spoiler Org Agents	Local Spoiler Org Cell	Military
Spoiler Org Followers	Local Neighborhood Areas	Social
Media Outlets	TV/Radio/Newspaper Office	Information
Protest Consequence Management	Medical Injury Site	Military
	Facility Damage Site	Infrastructure
Civil Population Support	Local Neighborhood	Social
Media Outlets	TV/Radio/Newspaper Office	Information
Civil Administrative Functions	Local Admin Office	Infrastructure
	Admin Official Vetting	Military
National/Local Elections	Election Event	Military
Media Outlets	TV/Radio/Newspaper Office	Information
Admin Office Security	Area Security Site	Military
Recruit Police Personnel	Recruitment Program	Military
Police Training Program	Police Training Facility	Military
	Training Program Delivery	Military
Media Outlets	TV/Radio/Newspaper Office	Information
Electric Power Networks	Electric Power Facility	Infrastructure
Water / Sewage Treatment	Water / Sewer Facility	Infrastructure
Media Outlets	TV/Radio/Newspaper Office	Information
Utility Systems Security	Area Security Site	Military
Telephone / Internet Grid	Communications Facility	Infrastructure
Broadcast Media Centers	Media Center Facility	Infrastructure
Media Outlets	TV/Radio/Newspaper Office	Information
Communications Security	Area Security Site	Military
Local School Facilities	School Building	Infrastructure
Media Outlets	TV/Radio/Newspaper Office	Information
Key Bridges	Bridge	Infrastructure
Key Roadways	Roadway	Infrastructure
Key Rail Lines	Rail Line	Infrastructure
Media Outlets	TV/Radio/Newspaper Office	Information
Transport System Security	Area Security Site	Military
Hospitals / Clinics	Hospital or Clinic	Infrastructure
Medical Stockpiles	Medical Supply Load	Infrastructure
Media Outlets	TV/Radio/Newspaper Office	Information
Key Military Leadership	Military Officer Vetting	Military
NCO / Enlisted Personnel	NCO / Enlisted Vetting	Military
Military Training Program	Military Training Facility	Military
	Training Program Delivery	Military
Military Equipment	Combat Vehicle Group	Military
	Soldier Equipment Group	Military
Media Outlets	TV/Radio/Newspaper Office	Information
Economic Aid Agreements	Aid / Monetary Agreement	Economic
Econ Development Projects	Project Coordination	Economic
Contractor Protection	Area Security Site	Economic
Media Outlets	TV/Radio/Newspaper Office	Information
PVO/NGO Projects	Project Coordination	Political
PVO/NGO Protection	Area Security Site	Military
Media Outlets	TV/Radio/Newspaper Office	Information