



## Design Thinking and the Development of “Real” Options for Decision-makers

by Dan McCauley

When a situation arises to which the United States considers deploying military forces, the Secretary of Defense (SECDEF) and President of the United States (POTUS) require a range of options from which to address the situation. The current course of action development process fails to provide these options. This failure to provide a range of options limits strategic flexibility and oftentimes leads to an inadequate or inappropriate solution for the given circumstances. Joint planners must change their traditional mindset for course of action development to include options that consider the multiple environmental conditions. The operational environment is rife with inconsistencies, incompatible desires, and competing requirements and, as such, requires the planner to develop multiple options that address the potential prominence of one requirement over another. By addressing the competing requirements in this manner, the planner presents a more comprehensive view of the environment while presenting the SECDEF and POTUS with the flexibility to approach the situation from different perspectives.

Design thinking enables the planner to develop and propose such options within the current context of the joint operation planning process (JOPP) with a slight modification. In a potential or actual crisis, the President decides whether the employment of military capabilities is necessary. As stated in JP 5-0, “The President, SECDEF, or CJCS initiates planning by deciding to develop military options.”<sup>1</sup> The Guidance for the Employment of the Force (GEF) and the Joint Strategic Capabilities Plan (JSCP) also direct combatant commanders to develop military options based upon given assumptions and conditions. Lack of specificity and perhaps a lack of understanding regarding the term “options” as prescribed by the SECDEF and strategic guidance documents are at the heart of the problem. As opposed to providing senior leadership with options for the employment of military force as desired, the planning process develops multiple courses of action to select the best single option to solve the problem. As a result, the current process presents strategic leadership with a virtual “fait accompli” regarding ways to use the military.

This essay proposes integrating elements of design thinking into the Mission Analysis and COA Development steps of the JOPP to develop the variety of options that the POTUS and SECDEF require in a complex and dynamic environment. This position is supported through the analysis of the strategic guidance and course of action development requirements. A discussion of the environmental constraints that shape the problem and the solution is critical to the critical and creative thinking process necessary when using the JOPP. The JOPP mission analysis step is discussed briefly to show how design thinking can be integrated into the planning process and

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<sup>1</sup> Joint Publication 5-0, *Joint Operation Planning*, Chairman, Joint Chiefs of Staff, Washington DC, 26 December 2006, p. III-19

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how continuing that line of thinking into the COA Development step is a natural and necessary extension to develop options. Finally, this essay will show how design thinking informs decision-makers of the competing operational requirements resulting that can result in a broader range of options for the POTUS and SECDEF as the employment of military forces is considered.

### ***Analysis of Strategic Guidance and Plan Development Requirements***

As described in the Adaptive Planning Roadmap II, decision-makers need “the ability to respond quickly to dynamic threats and challenges.”<sup>2</sup> The complexity of the environment and the dynamic circumstances that define the operating environment require “plans that contain multiple options that can be readily adapted to the given circumstances and then rapidly transitioned to execution.”<sup>3</sup>

The lack of plans that contain embedded options highlights one of the significant shortfalls of the current planning process--the idea that situations involving the use of military force have a straightforward cause and equally clear-cut solution. This type of thinking focuses on identifying a single root cause or driver and then developing a solution to solve the problem. The reality is that situations that require the employment of military force are extremely complex and usually contain multiple undesirable conditions caused by an array of drivers or that have their root causes originating from diverse conditions. Using design thinking, by identifying the primary generators<sup>4</sup> within a complex problem, the ability to develop military options for senior decision-makers becomes a reality. Identified in mission analysis, primary generators form the basis for subsequent course of action development. By expanding the thinking that encompasses course of action development by acknowledging and addressing the complexity of the situation, planners will develop much more relevant and useful products for senior decision-makers.

The purpose of military planning is to provide military options to the SECDEF and POTUS. Typically, these military options are considered in concert with other non-military options such as economic sanctions. Unfortunately, military options are typically the most responsive and visible of the instruments of national power available, thus usually employed first, and therefore must be flexible enough to address non-military issues in addition to the military requirements. Based upon the dialogue between the combatant commander and national leadership, guidance directs planners to “develop multiple viable options to achieve end states while providing commanders and national leaders flexibility in how they shape and respond to contingencies.”<sup>5</sup> Military operations occur in complex environments and must address a number of national security challenges as part of a total effort in the application of the instruments of national power.

Theater campaign plans encompass vast regions of the world with a wide array of actors, trends, challenges and potential disruptions, natural and manmade. Given the complexity of the strategic or operational environment, it is folly to think that a single driver or root cause can be

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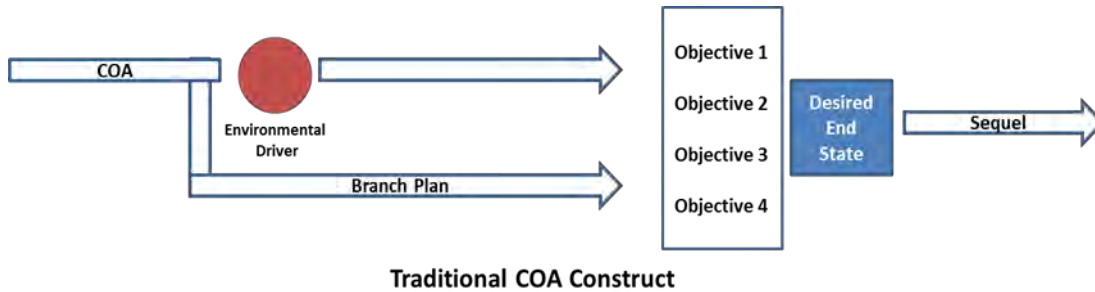
<sup>2</sup> Adaptive Planning Roadmap II, department of defense, March 2008, p. 6

<sup>3</sup> Ibid.

<sup>4</sup> Jane Darke, “The Primary Generator and the Design Process,” *Design Studies*, Vol 1, No. 1, July 1979, pages 36-43. The primary generator is an expression of what is valued; it is a concept or an objective that helps to generate a solution. It is a component of a designer’s cognitive structure. Closely linked to conjecture – defined as the conceptualization of a possible solution of a design task.

<sup>5</sup> Joint Publication 5-0, *Joint Operation Planning*, Chairman, Joint Chiefs of Staff, Washington DC, Revised Final Coordination Copy, 25 October 2010, p. I3- I-5

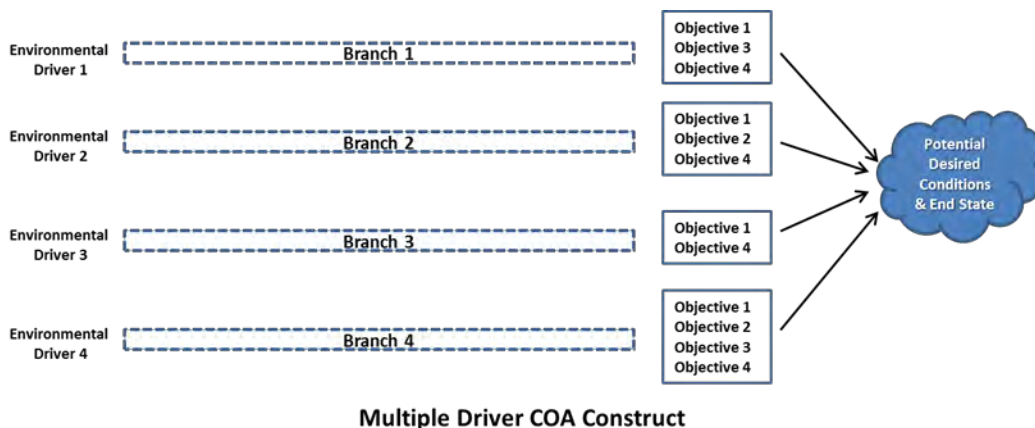
determined that would enable development of a single course of action that would satisfactorily resolve all of the complexities of the problem. More reasonable would be the identification and exploitation of several, if not multiple, competing drivers. In short, instead of the primary plan consisting of a single course of action (albeit with slight variations) with branches and a potential sequel (see Figure 1), the primary plan is composed of multiple branches capable of execution as conditions and national interest dictate (see Figure 2).



**Figure 1**

Figure 1 shows the traditional COA that may focus on a single environmental driver, if any at all, with the idea that the multiple objectives, which represent a range of desired conditions, are satisfied by addressing the single driver. A branch plan may be required if conditions are such that the preliminary effort is ineffective, but, again, the idea is that this branch plan will attain each of the objectives. If military operations cease but undesirable environmental conditions continue to exist, an additional mission or sequel is planned and executed.

Figure 2 portrays the concept that multiple drivers facilitate the concept of primary generators, which is a concept or conjecture that lends itself to a possible solution. This concept acknowledges the competing and often divergent conditions and proposed methods with which to address specific drivers. Each option likely facilitates attainment of only some of the intended objectives creating conditions that fall short of the desired conditions. As well, by addressing the different drivers, the end state condition will likely change as well, which requires strategic leadership to accept the proposed likely end states, reframe the guidance, or provide additional time or resources to the operation.



**Figure 2**

As one can readily see, this concept essentially adds an additional layer to the traditional operation planning process. Planning for each of these potential branches occurs in much the same manner as currently accomplished and wargamed to determine the level to which the objectives will be attained, along with an estimate of the environmental conditions resulting from the proposed actions. Once strategic leadership selects an acceptable option, courses of action development occurs in the same manner as currently accomplished. As previously mentioned, more time is required end-to-end, but more and better options are available for the SECDEF and POTUS to make a decision. In addition, a far better understanding of the interaction, influences, and relationships of the multitude of environmental conditions and factors is available to the commander and planning staff. The greater understanding of the environment will enhance problem understanding and facilitate the operational approach or course of action.

This concept equally applies to contingency and crisis action planning although current doctrine closely facilitates this cognitive process through the lines of operations and phasing constructs. Design thinking, however, would require far greater analysis of the non-military drivers that created the conditions that require a military response. This type of analysis potentially necessitates that strategic leadership to execute the full range of the instruments of national power simultaneously, specifically the diplomatic (read interagency) and economic instruments to address the multiple drivers. Commanders and planners would have to learn to be comfortable with ambiguity and that there may be competing and incompatible requirements equally important. Military planners may feel uncomfortable at the theater strategic and strategic levels, but the strategic and tactical levels are inextricably linked and are considered within the context of one another lest failure occurs.

To meet these complex environmental requirements, it is only reasonable for military planners to develop options that address, or at least acknowledge, the inconsistent, incompatible and often competing requirements that make a single proposed solution naïve at best. Military planners must develop plans flexible enough to adapt to the dynamic operational environment and provide leadership with multiple approaches to an acceptable end state through multiple means.

Planners must embrace the new strategy of shaping the environment by understanding the strategic or theater strategic environmental conditions and develop campaign plans, to include contingency plans, responsive to the changing environmental variables and allow military and civilian leadership to take advantage of opportunities when they arise. Strategic guidance documents and joint doctrine explicitly state the need for military options. Options imply an alternative course of action or something offered in addition to the standard.<sup>6</sup> The current process fails to deliver those options. The first step in developing options is an understanding of the environmental constraints that shape the nature of the problem as well as the approach to the problem.

### ***Environmental Constraints***

To provide options, an understanding of the environment and the actors and other variables that make up the environment is essential. Without this understanding, a single option, let alone multiple options, would be inadequate if not impossible. During the day-to-day operations of a COCOM, the J-2 and J-3 are piecing together a picture of the environment that

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<sup>6</sup> Merriam-Webster's Collegiate Dictionary, 10<sup>th</sup> Edition, Springfield, MA, 2001, p. 815

describes not only the physical attributes, but also the relationships, intensities, trends, and friction points within the theater environment and among the variables. This picture, known as the joint intelligence preparation of the operational environment (JIPOE), is a critical first-step in the development of a comprehensive understanding.

JIPOE only encompasses a portion of the environment—there are a number of other considerations that “fish out” a comprehensive understanding of the environment. Often viewed as constraints, these other considerations nonetheless add specificity to the environment and the nature of the problem (and by extension potential solutions), and provide the planner with the requisite understanding of the multiple competing, and oftentimes incongruous, variables. Without this understanding of the complex nature of the environment, any attempted solution will be a failure from the very beginning. Only by embracing complexity can one begin to understand problems and solutions within the proper contexts.

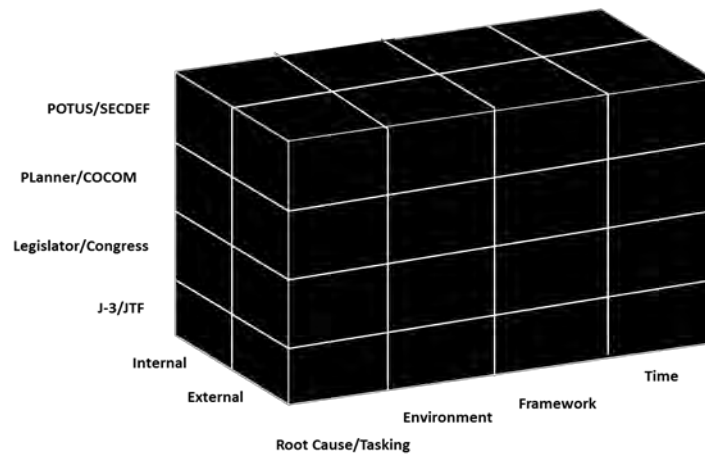
Part of embracing complexity begins with identifying those actors who have a role in the development and issuance of the guidance that provides the impetus for planning. For the COCOM planner that guidance typically comes in one of two forms: verbally or through written strategic guidance documents. In either case, the POTUS and SECDEF are the primary initiators of the strategy or plan who will ultimately validate or approve a plan, and, as such, considered an environmental constraint. Odd as it may initially appear, these individuals have likes, dislikes, prejudices, and predispositions that have a significant impact on the environmental perspective. Some senior leaders are more conservative whereas others are more liberal; some are more inclined to work as a team whereas others may be more willing to “go it alone.” Education, socio-economic, religious, cultural, and other variables form internal constraints on the individuals or groups part of the planning or decision-making process.

In addition to internal constraints, external constraints shape the nature of leadership’s view of the environment and the problem. The President, for example, may have domestic or cabinet issues imposing constraints on him or her as an individual. Ultimately, the list of internal and external constraints that affect a primary decision-makers ultimate choice can be quite extensive. The planner must also consider similar constraints that affect others in the guidance or tasking chain: the combatant commander, the lead planner, Congress, and the J-3 or JTF that will execute the plan are but a few to consider. Each of these individuals or groups has internal and external constraints to understand and consider.

Along with the individuals, groups, or organizations involved on the process, there are a number of other tangible constraints to consider. The environment, which includes the previously mentioned JIPOE and those aspects that encompass and ultimately generate the problem, most likely represents the most complicated and difficult constraint of all. An extension of JIPOE, this constraint requires the planner to understand the primarily non-military aspects of the environment. Another constraint is the root cause or the problem itself – it identifies and explains the purpose of the undertaking.

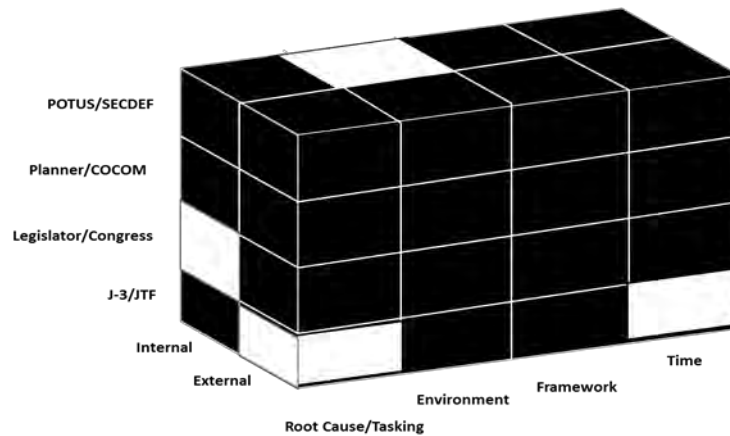
A third constraint is the framework that deals primarily with those things associated visually with the design – the format and rules of the design. The COCOM, CJCS, SECDEF, and others have a fundamental need for order and structure, so the plan must conform to that need although still allowing variety and creativity. The fourth constraint is time--time connects the past, present, and an uncertain future. The conditions that created the need for a design have a historical antecedent that must be understood and considered as a trend line for the future. The

design must incorporate the past and integrate within the current environment while being flexible enough to assimilate potential futures. The figure below (Figure 3) depicts one way to portray the major constraints considerations.



**Figure 3**

The concept of the primary generator is extremely helpful at this point and forms the basis for the future options made available to the SECDEF or POTUS. The primary generator restricts the range of possibilities while focusing on a limited number of constraints that enable movement toward a potential solution. The primary generator attempts to resolve the competing constraints and requirements by identifying the root of the problem and prioritizing the constraints. Multiple primary generators may provide the planner with alternative approaches to solving the problem. In the end, one primary generator typically emerges that the planner deems to have best satisfied the competing requirements and constraints.



**Figure 4**

Figure 4 represents a hypothetical example in which there are four competing constraints when considering potential humanitarian relief responses to a natural disaster, in this case a severe drought and subsequent starvation. Each constraint may represent a potential option for solving the problem. Members of Congress may have a constituency that desires involvement in another country because of ex-patriot economic and family ties yet Congress is unwilling to spend significant time or resources addressing more than the immediate problem. A root cause

of the problem may be religious or ethnic-based whereas the nature of the environment suggests that economic, ethnic, and religious factors are regional issues. In addition, the time consideration highlights that these have been historical issues for hundreds of years (including the cycle of droughts) and that any permanent change within the environmental conditions will require U.S. involvement for a significant period.

In this hypothetical example, each of these constraints represents options from which to choose. For example, addressing Congress' concern may result in a short humanitarian relief effort designed to relieve the immediate human suffering. Another option would be to address one of the larger problems. The response could entail the immediate relief effort and an attempt to emplace a food distribution concept that will ensure foodstuffs cross ethnic lines in times of crisis. Another option would be the immediate relief effort and an effort to develop water preservation and irrigation systems designed to address those periods of water shortages. A fourth option may address the immediate crisis and work with the national government over a longer period to develop national and regional systems and institutions capable of addressing these concerns that cross religious, cultural, and ethnic lines. It would be relatively simple to add other layers to the matrix, to include other interested nations, regional organizations, and global or regional institutions that would provide the planner with an even broader perspective and increased ability to present even more options.

Each of these options is valid yet significantly different. Through prioritization, the decision-maker can select the best option available for that time and in consideration of other theater or global conditions and requirements. Each of these potential courses of action are then fully developed using the COA Development step as outlined in JP 5-0 with a modification. Each option will have a minimum of one objective or condition in common that addresses the immediate problem. As each option addresses the problem within a different context, the objectives and the end state for each of these options will differ accordingly. This expansion of objectives and the end state is a deviation from current doctrine but is necessary to address the environmental complexity and causal relationships. Slight modifications to the current mission analysis and COA development steps can easily incorporate this change. In short, the benefit of using primary generators and other design thinking concepts is that consideration is given to a broader range of perspectives, which facilitates a better understanding of the environment and the problem itself and, in the end, provides more options.

### ***The Integration of Design Thinking into Plan Development***

Design thinking represents a cognitive approach to understanding the environment and the subsequent development of potential solutions. Integrating JIPOE products, mission analysis is the step within the planning process that adds understanding to available information in the context of desirable, undesirable, or neutral environmental conditions from a national interest standpoint. Whereas nature itself and human societies are composed of complex, dynamic, and interactive systems, one's understanding of those systems and their relationships is typically superficial at best. This lack of understanding leads to the perception that "problems" are highly complex, ill-structured, and chaotic. Although the environment is highly complex and chaotic,<sup>7</sup>

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<sup>7</sup> Chaos theory teaches that the dynamics of complex processes are non-linear – that small changes in the initial conditions of such processes may give rise to unforeseen future transformations. See *Complexity and Semiosis of Human Life*, by Vladimir Dimitrov for additional information.

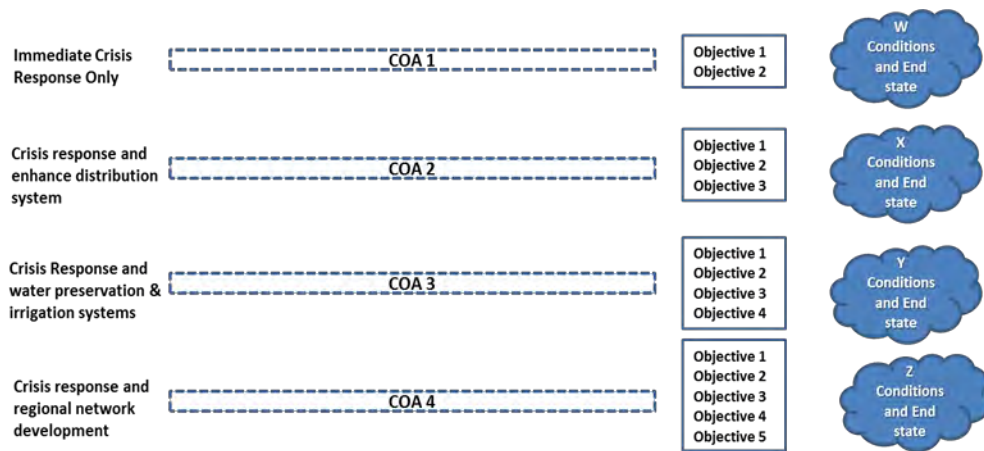
it is only ill-structured because of our inability or lack of time to understand adequately the environmental systems.

Our sense of an ill-structured environment and problem diminishes as an increased understanding of the interdependent nature of the environmental systems occurs, as systems are understood to envelope and be enveloped by other systems, and as understanding occurs that the emergence of new systems or patterns of behavior emerge based upon the interaction of these systems. In any military endeavor, complexity is a constant and embraced to understand the nature of the environment as much as possible. Acknowledging that complete understanding will never occur, an attempt is made at understanding as much of the environment as possible in the available time, so that the consequences from proposed options or courses action can be more fully understood and used to inform decision-makers better.

Strategic guidance initiates mission analysis and an understanding of the factors that will affect or constrain the development of the operation. As the planner considers the desires or objectives of the actors and the environmental conditions in relationship to one another, the development of a more comprehensive understanding of the primary generators or drivers within the environment occurs. Planners must factor these primary generators into their analysis, as they may be competing or complementary considerations that may constrain the approach to a problem.

Strategic guidance should describe to the planner what the initial assessment of the situation is, the problem, the desired outcome, and the proposed military objectives. Senior leadership typically does not have the detailed knowledge and understanding of the environment that planners possess or should possess. As a result, modification of the initial guidance is likely to occur to take into account those unknown factors, primary generators, drivers, and systems understanding. As the identification of the numbers and types of drivers occurs, the problem set and the potential response options increases. Because of this increase, there will be an increase in the number of objectives for each option and an accompanying change in the associated end state.

The resultant outcome of mission analysis remains the commander's intent and initial planning guidance. What changes is the concept that the initial objectives remain static and that only one operational approach is developed. Within the commander's planning guidance, acknowledgement of the interactive nature of the environmental systems is necessary and that the initial approach to the problem is that the *minimal* action (also acknowledging that "do nothing" is an option) that must be addressed. Additional approaches or options that encompass the initial problem set must be developed in recognition of the interactive nature of systems and subsystems and the other drivers within the environment. Because of this expanded commander's planning guidance, additional options will contain supplementary objectives and present a somewhat different end state. Figure 5 represents an example of the framework using the previous humanitarian assistance scenario.



Multiple Driver COA Construct

Figure 5

Course of action development continues this line of thinking by developing these primary generators or environmental drivers into courses of action. Each of these courses of action encompasses the same requirements as outlined in the COA Development step of the JOPP and, after further analysis and comparison, presented to the commander for selection and further development. This presentation provides the commander with an expanded understanding of the environment and options from which to address the problem given the current conditions. As part of plan development, the retention of all options as an annex is required and forms the basis for a different approach to the problem if conditions change.

### ***Informing Decision-makers with Design Thinking***

Using systems theory as a base, primary generators are a way to integrate design thinking into the planning process. This integration changes the traditional mission analysis and COA development steps by expanding the planner's perspective to encompass a broader range of environmental variables that have a stake in the desired outcome in some way. This broader perspective is necessary in the development of an understanding of the complex systems that make up the operating environment. Only through this type of understanding can planners begin to understanding the effects potential actions, or inactions, have on the environment and any potential solutions. The identification of other major stakeholders identified through primary generator development provides decision-makers with a clearer understanding of the various and dynamic interests that make up the environment.

Primary generators and other design thinking insights can be applied equally to the development of strategies and plans. Theater campaign plans, contingency plans, and crisis action plans would benefit from this expanded thinking and would immediately highlight the need for a whole of government or collaborative approach. Crisis action planning will require planners to consider potential options concurrently with the initial reaction used to address the immediate problem. This concurrent, and sometimes retrospective analysis, may necessitate a greater or lesser military commitment or focus as the situation unfolds over time. As such, decision-makers and planners must be ready to evolve to potentially unrelated lines of operation, new objectives, or a substantially revised end state.

Plans that contain multiple options and are responsive to the ever-changing nature of the operating environment are necessary in today's complex, interconnected, and rapidly changing world. Plans that integrate design thinking concepts better addresses the SECDEF and POTUS' desires and make the plan more responsive and viable throughout its lifespan. Current doctrine can be easily modified or reoriented to incorporate the development of multiple options and would assist in the continued development of "living plans" as envisioned by the Adaptive Planning Roadmap II. Furthermore, using design thinking concepts such as the primary generator leads to a greater understanding of the nature of the environmental systems and their associated relationships and interactions. This greater understanding will inevitably enhance any proposed solutions and may finally yield the strategic successes that have been so elusive.

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