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Linking Defense Planning and Resource Decisions: A Return to Systems Thinking

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Much like the planning, programming and budgeting system (PPBS) introduced into many national governments in the 1960s and 1970s, today's planning-to-resourcing systems have returned to focus on systems or capabilities. This article provides an overview of the steps required to define and implement a defense planning-to-resourcing system with a focus on systems or capabilities. Research on defense planning shows that defense planners continuously strive to "improve" by alternating their planning focus among capabilities, systems and functions, where the building block of defense is viewed as capabilities, systems or functions, respectively.

Budgeters, by trade, legislation and expectation remain focused on inputs purchased. The difficulty with linking plans to resources lies in the details: the explicit connections between planning and budgeting to ensure that defense allocates resources according to the choices and preferences made in the planning stage. This article returns to the dilemma faced for at least 50 years: can defense link the choices of planners, via program budgets, to resource allocation decisions? This article describes one method to support the choices of decision-makers from desired capabilities through to budgets and back. While the focus is on planning based on capabilities, the discussion applies to other defense planning and resourcing systems.

INTRODUCTION

One of the greatest difficulties in defense planning and resourcing is bridging the divide between planners who develop a joint strategy for the current and future capabilities of the armed forces, and the budgeters who must translate this plan into actual inputs purchased. These two groups can work closely with one another or can be legally mandated to be separate, strictly independent entities such as in Germany.¹ No matter

the perceived distance of these groups, the central issue of connecting the choices of planners to actual resource allocation remains. The difficulty with mapping plans to resources lies in the details: the explicit connections between planning and budgeting to ensure that defense allocates resources according to the choices and preferences made in the planning stage. As was the case at the inception of the Planning, Programming and Budgeting System in the 1960s, to make resource allocation tradeoffs requires connecting planning and budgeting.

Program budgeting offered perhaps the earliest solution to this dilemma. A program budget, described in more detail below in Step 3, functions by general rules. It provides the link between plans and budgets through a program structure, showing explicit connections from policy objectives to the amounts budgeted to force units and weapons systems to achieve them. Program budgets can vary widely to suit the needs of the planning-to-resourcing system, and this latitude has caused much confusion. When policy objectives change, military plans change and programs must reflect these changes; otherwise, the vital link between policy objectives – desired outputs and outcomes – and the funded force units or systems used to meet the objectives will be misaligned. The authors' experience suggests that in many countries and organizations, misalignment between planned capabilities and budget systems results in the inability to connect plans to resources. This article details one possible method to support the choices of decision makers from desired capabilities through to budgets and back, highlighting the importance of systems thinking.

BACKGROUND

Since the 1960s, the planning focus of military resource allocation has alternated among capabilities, systems and functions where planners view the building block of defense as capabilities, systems and functions, respectively. Many Ministries or Departments of Defense continue to shift the orientation of their planning and resourcing systems from service-driven demands for weapons and platforms to the top-down determination of capabilities to meet a range of probabilistically determined threats. Australia, Canada, New Zealand, the United Kingdom, NATO, EU organizations (such as the Military Staff of the European Union and the European Defence Agency) and countries of the EU, among others, employ Capabilities-Based Planning (CBP) to improve the linkages among alliance or national goals, strategic plans, military capabilities, and the allocation of defense resources. While the term “capabilities-based planning” seems to be out of fashion in the US, defense leaders clearly believe planning and executing strategy require the formulation of needed capabilities. The recently released 2010 Quadrennial Defense Review “advances two clear objectives”:

First, to further rebalance the *capabilities* of America's Armed Forces to prevail in today's wars, while building the *capabilities* needed to deal with future threats.
Second, to further reform the Department's institutions and processes to better support the urgent needs of the war fighter; buy weapons that are usable, affordable, and truly needed; and ensure that taxpayer dollars are spent wisely and responsibly.²

While many documents and articles discuss the planning required by CBP or to advance capabilities, few leaders give clear and explicit directions on the implementation of CBP and budgets. Partly this is due to the confusion that still surrounds CBP. No one has properly defined CBP and the debate about what the term means continues. Fitzsimmons summarizes the dilemma:

[. . .] it is remarkable that no official definition of the concept exists. But there are probably as many definitions in the Pentagon as there are phone numbers, and debate continues over just what the concept is, as well as whether it is appropriate or even feasible as a framework for defense planning and decision making. The persistence of these debates raises a fundamental question: What is CBP?³

In the authors' opinion, Fitzsimmons also provides the best answer, highlighting the need for a full management system. CBP “. . . should be an effective investment strategy that *develops and sustains*⁴ the capability priorities identified through the planning exercise.”⁵ Using this answer and the DoD's definition of capability – the ability to execute a specified course of action⁶ – this article suggests a method for successfully incorporating CBP in a defense (or other government organization) resource allocation process.⁷

WHY PLAN BASED ON CAPABILITIES?

CBP, or any planning system based on identifying needed security capabilities, offers several benefits; it focuses leaders of a defense organization on what the organization needs to accomplish instead of the platforms and systems owned or in need of replacement. Systems and platforms provide value only when used – what they do in times of need. Therefore, CBP aims to delay decisions on specific systems by first allowing planners to consider needed capabilities and then encouraging the development of more innovative alternatives. This process helps leaders overcome the tendency to replace platforms and equipment with the latest models of each. CBP also aims to broaden the range of missions for which forces are prepared, facilitating analysis of a great number of scenarios and future conditions.

Additionally, CBP makes the joint perspective predominant in all planning and programming activities, forcing the services to suggest alternative ways to meet capability needs and allowing DoD planners to choose among the alternatives. Finally, CBP assists planners by using risk as a strategic measure of effectiveness, helping them determine their exposure to unwanted outcomes.⁸ While ultimately CBP leads to choices among systems and platforms to provide capabilities, it attempts to move planners away from suggesting solutions too early in the planning process.

IN IMPLEMENTING CBP: STRATEGIC PLANNING AND SCENARIO SELECTION

CBP begins with strategic plans. An organization's leaders must first analyze the context of possible future environments in which the organization may be required to operate. Combining stated political guidance on strategic goals and objectives and

examining likely future conditions, leaders can begin to identify and address important strategic issues. Multiple methods of thinking about what the organization “should” do abound; Bryson notes,

To respond effectively to changes in their environments, public and nonprofit organizations [. . .] must understand the external and internal contexts within which they find themselves so that they can develop effective strategies [. . .]⁹

Context gives leaders the information they need to build scenarios with a sufficiently broad view of possible future environments. Bryson recommends developing the context using a SWOC analysis, which identifies and assesses Strengths, Weaknesses, Opportunities and Challenges facing the organization.¹⁰ The SWOC helps leaders create plans that shape and guide the organization, providing information on today’s capabilities and the decisions and actions necessary to change or update those capabilities. Bryson also notes that,

[. . .] any effective response to potential challenges or opportunities must be based on an intimate knowledge of the organization’s capabilities and the strengths and weaknesses they entail. Strategic planning, in other words, is concerned with finding the best or most advantageous fit between an organization and its environment based on an intimate understanding of both.¹¹

The recommendation then, is that DoD planners involve groups of capability developers to help build scenarios that acknowledge and reflect uncertainty.¹² The authors also recommend they take the far harder path: to imagine major shifts in the geopolitical landscape rather than small changes to the *status quo*. History has repeatedly shown that we need to expect the unexpected and to imagine a future very different from the current state. Consider, for example, planning for a fifteen-year time horizon at the beginning of the twentieth century. In 1900, would defense agencies have been able to predict the world reality as of 1915, in 1915, the reality of 1930, in 1930, the reality of 1945, and in 1945, the reality of 1960? Predicting such “tectonic shifts” in world landscape is nearly impossible: How do you tell a realistic future from science fiction? Or when can you expect what you think of as science fiction to become real? While this article offers no concrete answers to these questions, it reminds planners that the goal of strategic planning is to confront – rather than discount – uncertainty and to consider possible events and outcomes across a wide variety of futures.

To confront multiple possible futures, CBP prescribes that planners use different scenarios, starting with an assumed baseline scenario. Typical baseline scenarios reflect six dimensions:

- the political military context, e.g. how the situation came about, who is allied with whom, the degree of strategic warning, forward stationing of forces, etc.;
- the objectives and strategies of all involved;
- the forces, such as size, character, nominal capabilities;
- force effectiveness, accounting for cohesion, morale, etc. of all involved forces;

- the natural environment; and
- other assumptions.

For example, suppose military planners consider a scenario where an ally asks their country to intervene in a regional war between two small neighboring countries. An extremely simplified example of a baseline scenario for this possible future could be:

- Political military context – Countries A and B have had an on-going border dispute for over 200 years with flare-ups approximately every 25 years, but as the value of mineral deposits in the border region increases, the conflicts become more frequent as both sides claim the deposits. Countries A and B are each allied with larger Countries C and D, respectively, that have had a history of conflict as well. Your country is viewed as relatively neutral.
- Objectives and strategies – Countries A and B wish to have the glory of claiming victory in the historical dispute and gaining the riches from selling the mineral deposits. Countries C and D wish to maintain a strong level of influence in their respective allied countries and gain sole access to the minerals mined in the disputed territory. Your country wishes to ensure that war does not spread from these minor regional flare-ups.
- Forces – Countries A and B have low-technology armed forces, with primarily infantry and light tank brigades. Countries C and D have high-technology armed forces with extensive air forces and offensive firepower. Your country has a modern but small force, generally designed for defense of the homeland.
- Force effectiveness – Countries A and B have extremely cohesive, nationalistic forces. They perceive they are fighting for their honor and are not open to any foreign intervention (pro or con). Lack of modern technologies hinders their effectiveness. Countries C and D have forces equipped with the best technology available, but the forces are not very cohesive due to infighting among the different military branches and a mixed reaction to intervening in foreign countries for monetary gain. Your country has very cohesive forces but the country is small, the political sentiment is somewhat isolationist, and you have great hesitancy to intervene in another country's business.
- Environment – The region has a temperate but moist climate and several infectious diseases are still prevalent, which have been successfully eradicated in your country.
- Other assumptions – You expect the worth of the mineral deposits to increase 100-fold due to a mounting world shortage.

Planners then look for likely variations from the baseline scenario and consider the security consequences (e.g., what if mineral prices only increase ten-fold?). Next, they look for unlikely variations from the baseline that could have serious consequences (e.g., what if Country C instigates war to gain immediate mineral access and subsume its allied country?). Planners choose a set of scenarios they deem to be of high risk or extensive negative consequence, where risk is defined using three points: What can go wrong? What is the likelihood that it happens? And what are the consequences if it does?

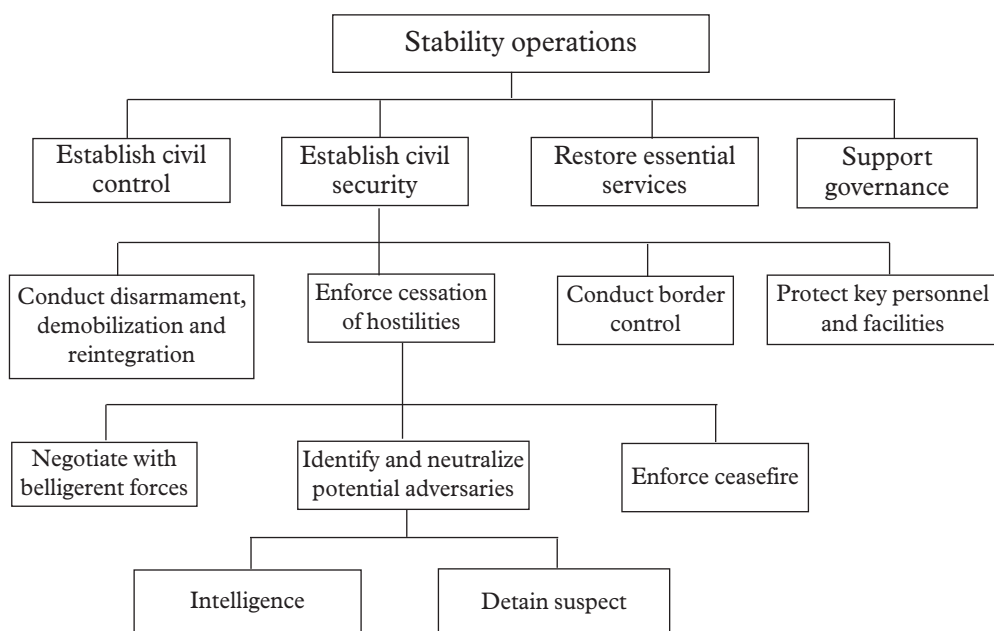
Perhaps more so in the security environment than other settings, planners must consider “Black Swan Events” – high-impact, hard-to-predict, and rare events beyond the realm of “normal” expectations.¹³ Using their assessment of risk and consequences, leaders then choose a subset of scenarios for in-depth study, leading to further considerations of perceptions of risk, politics, and the ability to cover a broad spectrum of situations.

DEVELOP CAPABILITY TREES OR HIERARCHIES

Once planners agree on a set of scenarios, they use the scenarios to identify “. . . the complete set of capabilities considered necessary to meet the quantitative and qualitative ambitions set out in the political guidance for defense planning through a structured, comprehensive, transparent and traceable process . . .”¹⁴ Capability trees provide a useful approach to continue to develop capability needs for each of the scenarios. A capability hierarchy, or tree, visually represents the elemental capabilities required to address the scenario. The hierarchy starts with general descriptions of a capability then refines each level, illustrating smaller and more precise capabilities needed to produce the more general capability. It uses an “and” logic. The base of the hierarchy shows elemental capabilities needed to address the scenario.

For example, imagine the following scenario. A small country experiences a civil war and its government appeals to international organizations for help in stabilizing the country. Using knowledge of stability operations, planners in a country or alliance organization begin to define exactly what they mean by “stability operations”; that is, they use a hierarchy to determine the elemental capabilities needed to provide stability operations. As Figure 1 illustrates, each level of the hierarchy further refines capabilities.

Figure 1: Example of a capabilities hierarchy for stability operations



The top level of the hierarchy simply states the desired capability of stability operations. On the second level, planners define four essential capabilities for providing stability ops: “Establish civil control;” “Establish civil security;” “Restore essential services” and “Support governance.” To define “Establish civil security,” planners define four more capabilities. Using the “and” logic, they work down the hierarchy until the point where the discussion of how to provide a capability becomes a discussion of alternative forces or weapons. When planners begin to use an “or” structure, they are talking about alternatives and should go back up a level.

In the case of “Detain suspect,” planners could consider different force units to provide the capability, e.g., military police, special forces or a regular army unit. Because they use an “or” logic, the planners recognize these alternatives provide the means to deliver the capability. Therefore, the elemental capability is “Detain suspect,” the lowest possible level on this branch of the hierarchy. Planners must define elemental capabilities so they can match them with existing and future weapons or units.

The most common pitfall with this approach is that organizations go too far down the hierarchy, to the point of specifying alternative forces or weapons, such as special forces. Planners must develop capability hierarchies to a level where they can identify possible units (systems) able to deliver a capability but not to a point where they specify only one system. Constructing a hierarchy differs from military operations planning – if planners forget this, their choices for delivery of capabilities will be affected by their own backgrounds. Armored division officers tend to require tanks and air force officers tend to require aircraft, etc. Planners must recognize the elementary capability level and stop their analysis before the choices of alternatives begins.

Recognizing that construction of hierarchies is an art, not an exact science, planners must agree to move ahead with a “good enough” hierarchy for each scenario. Once they agree on a capability hierarchy for each scenario, they can begin to see elemental capabilities that address multiple or all scenarios. Planners then aggregate across scenarios to determine defense’s collective need for an elemental capability.

To help determine collective need for a capability for the organization as a whole, planners consider the relative importance and likelihood of each scenario and the stated level of effort or national goals (or coalition or alliance goals), then agree on the relative importance of capabilities. Planners also determine whether the capability is likely to be needed sequentially or concurrently in the hierarchies and in the scenarios. In the end, a country and its defense planners provide a master list of elemental capabilities across scenarios, showing the conditions under which concurrent use of capabilities may occur. This estimation requires much subjective assessment on how best to combine the “quantitative” amounts of an elemental capability derived from the capability hierarchies. No “one size fits all” or best aggregation method exists.

FROM CAPABILITIES TO BUDGETS: PROGRAM BUDGETING AND THE PROGRAM STRUCTURE

Once planners list desired capabilities and the quantities needed concurrently, they begin to determine where gaps exist relative to the current force structure. Master capability lists reveal gaps in (or “excess”) capability, but do not address funding of the

actual forces and weapons systems used to fill the gaps and provide capabilities. Planning systems such as CBP do not provide a framework for connecting to a resources management system. Translating desired outcomes or capabilities into outputs using capabilities hierarchies or trees does not directly lead to a budget listing inputs required. Traditional legal budgeting generally requires allocation along such lines. Decision-makers need a framework in which to analyze alternative weapons and forces, their costs and their substitutability or complementarity.

Thus to implement CBP (or any planning system) requires organizations to explicitly link inputs (budgets) to outputs thought to reflect the choices and preferences made during the planning process (capabilities). As Novick, Schick and others note, decision-makers have used the framework of program budgets to direct their focus to planning, allowing assessment of strategies and the efficiency of public expenditures in achieving goals.¹⁵ Bourdeaux notes that

research [. . .] and the general literature suggests [*sic*] building a program structure that aligns resources with strategic plans and ties services or products to outcomes, objectives, goals and mission.¹⁶

Program budgeting through the program structure provides a two-way flow of information from threats or challenges to national interests, to policies and strategies to respond to the threats, to capabilities needed to implement strategies, to forces or weapons systems needed to provide capabilities, to budgets and back again:

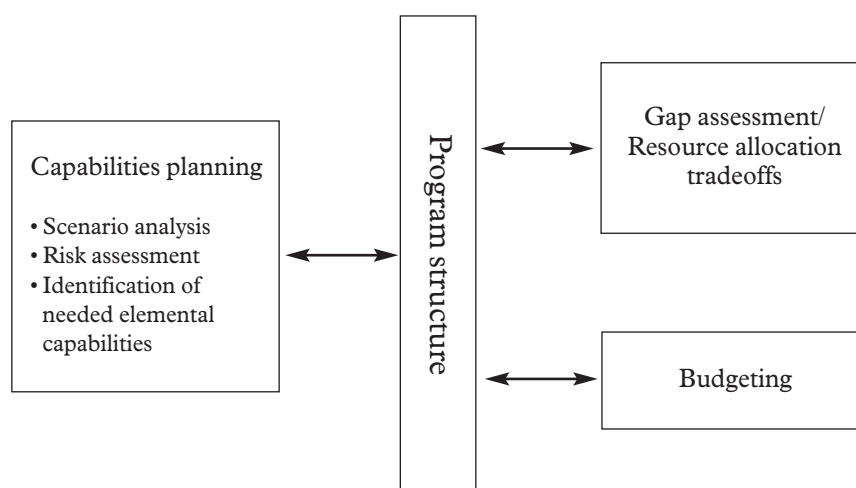
National interests ↔ Threat ↔ Policy/Strategy ↔ Capabilities ↔ Forces ↔ Budget

Planners can link strategic plans to a resources management system if they translate desired goals and objectives into outputs (force units and weapons systems) then list them in a program structure. To facilitate a comparative evaluation of different activities in relation to each other and in relation to their relative costs, resource decision-makers employ a program structure to connect inputs to outputs.

The program structure classifies – *for budgeting purposes* – outputs relative to purpose by major policy, function served, capability desired, geographical area or other meaningful defense or security construct. Resource decision-makers classify the outputs, called major programs, in relation to major activities or strategies that help an agency achieve its goals.¹⁷ More specifically, Bourdeaux states that programs:

[. . .] Can be defined based on long-term, intermediate, or short-term outcomes (and their associated products and services). Programs can also center around customers served, populations served, geographic service areas, or organization arrangements.¹⁸ (p. 24)

Figure 2 shows the bridge that the program structure provides between planning, resourcing and resource allocation tradeoffs.

Figure 2: Using a Program Structure to Connect Capabilities to Budgets

To make tighter connections between capabilities desired to achieve strategic goals and the resources to fund them, the authors recommend that resource decision-makers use major capability areas as programs in the program structure. Major programs based on major capability areas such as direct combat, intelligence and reconnaissance, command and control, protection, deployability, stability operations and information superiority, more closely link capability-based plans to resources. For resources management purposes, the authors' experiences suggest that the greater the difference between capabilities desired and major programs, the more difficult it is to connect budgets to outputs and outcomes.

To illustrate a capability-based program structure, consider the "Detain suspect" elemental capability from the Stability Ops example, above. Stability Operations could be a major program in the program structure. Note that the program structure corresponds to a program budget; thus, defense uses it *for resourcing purposes* rather than organizational, operational or other purposes. At the next level, decision-makers can organize functional or capability related sub-programs – again for resourcing purposes – to support stability operations. An example might be "Cessation of hostilities." Under this sub-program, decision-makers list program elements that support "Cessation of hostilities." The program elements are all force units and weapons systems whose primary purpose is to provide "outputs" in support of this capability. Arraying units or systems under the capability for which they primarily exist shows explicit connections from policy objectives to the amounts budgeted for a specific unit or weapon to achieve them. If the alternative designated to "Detain suspect" is army unit "x" that "Detains suspect" as its primary purpose, the program structure might include:

- (Major Program) 2. Stability Operations Forces (major program)
- (Sub-Program) 2.1. Cessation of Hostilities (sub-program)
- (Program Element) 2.1.1 Army "unit x"

By arraying force units and weapons systems using a program structure, decision-makers see complementary, substitutable, or stand-alone program elements and their relationship to the budget. Using the program element as the basic building block of the program structure also allows resource managers to generate budgets and information relative to many managers' needs. The database of program elements – such as military policy units or aircraft “x” – contains the number of operational units, number of personnel (military and civilian), and planned expenditures by procurement category (military personnel, operations and maintenance, procurement, military construction, research and development, etc.) for the complete force unit or weapons system to operate. Thus, planners can compare alternative ways to provide a capability by various budget expenditures, by personnel requirements, etc.

The main difficulty in implementing program budgets comes from having to list units and systems in only one place in the program structure. Operationally, forces and systems may support different missions, often supporting different capabilities. This illustrates why public budgeting has never completely “solved” the problem of “What do I get for what I spent?” Operationally, defense plans for and uses many force units or weapons systems to meet more than one goal and in support of more than one capability.¹⁹ For budgeting, resource planners must array forces and units so that they see total amounts of money going to each, in one place. The capability of “Detain suspect” may show up in capability areas other than stability operations. Trying to divide the budget for a force unit or weapon system into multiple programs (or capabilities), however, provides a level of complexity far beyond most organizations' ability to track and respond to funding requests.

Accordingly, the “rules” of a program structure dictate that a force unit or weapons system shows up in only one place – under the major program where it serves its primary purpose. This does not lessen the unit's ability to provide capabilities in other areas, nor does it stop organizations from “reimbursing” one another for using the same force unit or weapons system for different purposes. It simply provides decision-makers with a direct link from the ability to provide a major capability to the forces and units needed to do so, and their associated funding requests.

A mapping from elemental capability in the master capability list to chosen alternative (force unit, system, etc.) in the program structure can be made as long as resource planners and capability planners list every force unit or weapons system in the program structure once and only once (mutually exclusive and collectively exhaustive) into groups of substitutes and complements. As was true with the PPBS system in the 1960s and its evolution today, along with the experience of many countries and organizations, the difficulty remains in identifying and agreeing upon the primary use of a force unit or weapons system. This will be true, no matter what planning system and program structure planners use. Nevertheless, aligning the program structure with major capability areas allows inter-program (loosely defined capability) tradeoffs, and within a capability area, intra-capability tradeoffs (the outputs provided at the elemental capability level).

GAP ANALYSIS

As stated above, the program structure can be useful for determining what capability outputs exist within the current force structure. Because the program structure shows a force unit or weapons system under only one program, it does not allow complete analysis of capability gaps. Without it, however, planners and resource managers cannot make comparisons of the costs and benefits of elemental capabilities and program elements.

To determine where capabilities gaps exist, capability planners examine each elemental capability against existing units and systems in the program structure and determine whether existing forces can provide the desired capability. When the organization can provide the capability, planners should order or value each alternative force unit or weapons system for comparison purposes. For example, one of three alternatives – a military police unit, a special forces unit or a regular army unit – might provide the capability “Detain suspect”. Planners determine the number of existing military police units, special forces units and army units with respect to the elemental capability “Detain subject”, then determine how to value them relative to one another. Suppose planners assess military police units as the best way to provide the elemental capability, and assign them a score of ten out of ten. Suppose they also assign special forces units a score of seven out of ten and regular army units at six out of ten. Using this valuation and the number of units/forces available determines the amount of existing capability. Planners must take special care to account for concurrency and exclusivity of forces since one alternative (such as a regular army unit) can provide multiple elemental capabilities.

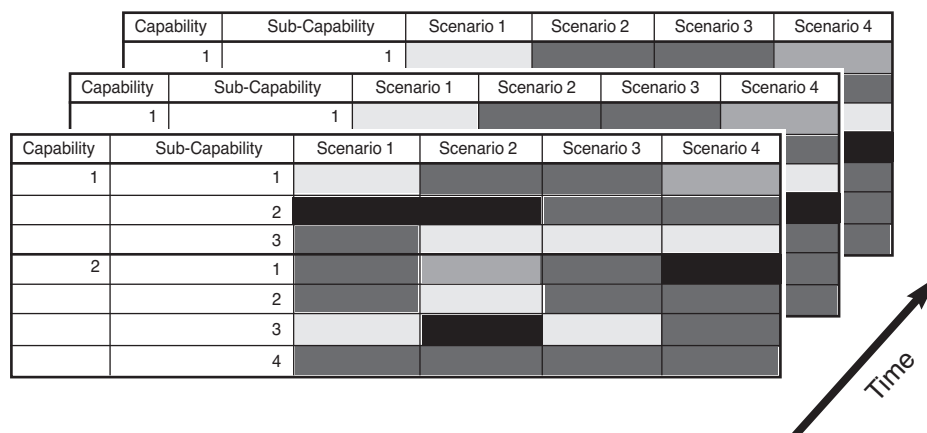
Once planners know concurrent needs for each elemental capability, they estimate gaps across all elemental capabilities. The gaps where too few or no force unit or weapons system provides the elemental capability become apparent. In addition, planners may find existing forces not needed to provide any elemental capability. These would be candidates for retirement, potentially freeing additional funds to help eliminate the gaps.

After identifying gaps, planners prioritize the capability gaps. To do this, planners first need to determine the relative importance of each elemental capability. Planners determine relative importance based on some combination of: in how many scenarios a capability is used and how many times it is used in each scenario. Sometimes, however, planners deem a capability critical if it alone determines the success of a mission in a particular scenario. While a mathematical approach may provide an initial estimate of relative importance, planners ultimately rank elemental capabilities subjectively.

Once planners have a sense of each capability’s relative importance, they can assess the risks posed by the gaps. This generally involves evaluating the relative importance (in terms of risk) of each scenario and the importance of each elemental capability. Figure 3 illustrates an example of the product of such an analysis. It shows a simplified version of one of the ways planners aggregate and determine where they have capability and where they do not. The figure shows capabilities by number, then sub-capabilities by number, then ratings of the organization’s ability to provide the

sub-capability using colors (■ = high ability; ■ = reasonable ability; ■ = some ability; ■ = no ability, for example).

Figure 3: Capabilities, Sub-Capabilities and Ratings of Ability to Provide Sub-Capabilities



After prioritizing desired capabilities, strategic planners, capability planners and resource managers consider alternative ways to fill the gaps. There may be many different ways to eliminate the gaps without resorting to major weapons platform purchases, such as changes in doctrine, organizational structure, training, systems (materiel systems, armaments), support (stocks and sustainment), personnel and infrastructure. The scenario dimensions above can help facilitate development of alternatives since they highlight all the important facets that contribute to a scenario's risk. The analysis of alternative ways to eliminate gaps should include cost-effectiveness and cost-risk concepts and the ability to trade-off one alternative for another. Maintaining the ability to make trade-offs means that planners should not have over-specified elemental capabilities. If planners define an elemental capability so that only one alternative can address it (e.g., defining an elemental capability so that only a Predator unmanned aerial vehicle with two Hellfire missiles can fulfill it) then they negate the purpose and spirit of CBP.

Last, planners evaluate new systems and new approaches on their contribution to all capability categories. The remaining problem, not addressed in this paper, is a portfolio analysis. Planners must determine the combination of alternatives that produces the greatest increase in capabilities in the most important capability gaps while remaining within the budget. The final steps include positioning the new capabilities within the program structure, developing an acquisition strategy, and ensuring all necessary costs are included in the budget as well as the Future Years Defense Plan (FYDP).

CONCLUSION

This article explores one of the greatest difficulties in defense planning and resourcing: bridging the divide between planners who develop a joint strategy for the current and future capabilities of the armed forces and the budgeters who must translate this plan into inputs purchased. To avoid misalignment between planned capabilities and budget systems resulting in the inability to connect plans to resources, the authors provide one method for mapping plans to resources using program budgets and the framework of a program structure. The authors describe how to support the choices of decision-makers from desired capabilities through to budgets and back, emphasizing systems thinking.

Future analysis might include an examination of and summary of lessons learned from countries and organizations that have met with at least limited success in implementing a planning-to-resourcing system. Research extending agency theory might help organizations better implement such a system. Since measures of cost and performance (output) do not always provide sub-organizations within defense (or the government agency) incentives aligned with goals and objectives of the MoD or DoD, sub-organizations may engage in activities that the MoD or DoD, if they had the sub-organization's information, would consider suboptimal.²⁰ Additionally, researchers might examine, among other topics, the impacts of 1) scenario risk analysis, particularly in an alliance setting (where different countries provide different capabilities and no central budget funds the joint (alliance) capabilities; 2) cost and cost-effectiveness analysis; and 3) risk on resource allocation in an alliance setting to increase the understanding of how planning based on capabilities can better link to resource management decisions.

NOTES

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3. M. Fitzsimmons, "Whither Capabilities-based Planning?", *Joint Forces Quarterly*, Issue 44, 2007, pp. 101–105.
4. Italics added by the authors for emphasis.
5. *Ibid.*
6. Joint Chiefs of Staff, Washington DC: US Department of Defense, 2005.
7. The authors do not attempt to prescribe steps for carrying out CBP through the execution process.
8. For more on these benefits, see *op. cit.*, also, P. Davis (MR-1513-OSD), *Analytic Architecture for Capabilities-Based Planning, Mission-System Analysis, and Transformation*, Washington DC: Office of the Secretary of Defense, US Department of Defense, 2002.
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10. For another example of how to identify strategic issues, Casey and Peck use Whole Goals® and Force Field Analysis with defense and other organizations. http://elg.net/index.php?option=com_content&view=article&id=5&Itemid=5&28e5bbf660cb545fc854f5c048c7be7c=54526e30ccc035811d7a014361103390 (This is the reference to their publications and information).
11. *Ibid.*, p. 125.

12. The authors use the term “planners” rather loosely in this article, combining strategic planners with capability developers or planners. In either case, they mean the people responsible for connecting strategic goals and objectives to capabilities or desired outcomes for defense or national security.
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17. Bourdeaux, “The problem with programs”, *op. cit.*,
18. *Ibid.*; B. Holmstrom and P. Milgrom, “Multitask Principal-agent Analyses: Incentive Contracts, Asset Ownership and Job Design”, *Journal of Law, Economics and Organization*, 1991.
19. It is important to remember that the program structure functions to better facilitate tradeoffs among strategic goals and resources, not to suggest how military units are organized or how they function.
20. See B. Holmstrom and P. Milgrom, “Multitask principal-agent analyses”, *op. cit.*, for an analysis of multi-task principal agent incentives and contracts. R. Wintrobe, “Modern Bureaucratic Theory”, *Perspectives on Public Choice*, 1997, reviews the literature on bargaining games between government agencies and their sponsors, while C. Prendergast, “The Provision of Incentives in Firms”, *Journal of Economic Literature*, 1999, pp. 7–63, reviews the literature on the provision of incentives in firms.