APPLICATION OF DYNARANK STRATEGIC PLANNING IN THE QDR

OBJECTIVES OF STRATEGIC ASSESSMENTS FOR THE QDR

As part of RAND's work in support of the Quadrennial Defense Review, we applied the DynaRank process to a broad range of capability- and budget-oriented options within the QDR. While this came too late to affect the QDR itself, it documented and confirmed preliminary analysis that we had provided earlier and offered a testing ground for DynaRank. Below we describe the application of DynaRank to that work.

One important issue for us was to examine how a variety of options would be ranked or rated as a function of how seriously one considered the various components of the emerging strategy of shape, respond, and prepare now. For example, what options would look good only for contingency capability (respond) and what options would contribute to shape and prepare now as well? How would heavy emphasis on major regional contingencies affect the defense program's ability to satisfy the other components of strategy? If we remain focused on the current period of time, what vulnerabilities will that lead to with respect to long-term adaptiveness of the defense program to future enemies and capabilities?

There was also concern about the budgetary impact of the new components of defense strategy. What reductions in forces might be made to permit modernization within a budget that might be generally declining in real terms, or that might be constant in real terms but plagued with the consequences of underfunding in the FY98 program? What is the impact of emphasizing presence operations relative to buying capabilities to fight major theater wars? Above all, we wanted an understanding of whether there were defense options that were robust in the sense that they remained cost-effective across a range of emphasis on the strategy components and across a range of emphasis on the scenarios, cases, regions, and performance measures for the second and third tier of defense criteria.

This chapter describes how we applied DynaRank to an investigation of these QDR issues to further illustrate the setup and application of DynaRank to defense planning problems.
DEFINING THE HIERARCHY OF DEFENSE CRITERIA

The Respond Component of Strategy

This dimension involves the ability to respond to MTWs and small-scale contingencies (SSCs). The predominant planning scenarios for MTWs are a conflict in Northeast Asia (NEA) involving North and South Korea, and conflict in SWA involving Iraq. Concatenation of these scenarios leads to the two MTW criteria for force sizing. That is, a stressing case for U.S. planning involving two nearly simultaneous major theater wars. Other major theater conflicts can be imagined, such as a resurgent Russia or a militarily aggressive China, as well as conflicts involving India, Iran, etc. From the standpoint of the scorecard, each of these is represented by a group of columns in which the subordinate effectiveness measures involve variations in scenarios or cases within scenarios, and, subordinate to those, measures of conflict outcome.¹

The U.S. ability to deal with SSCs provides another set of criteria. Again, one has scenarios such as Bosnia, Panama, Haiti, and Somalia, variations in conditions associated with each (with or without allies, various constraints on the use of force, etc.), and measures of outcome such as friendly casualties and time to subdue hostile elements. In examining stressing cases for force structure it is possible to consider one or more of the SSCs happening simultaneously with an MTW.

A hierarchy of columns (effectiveness measures) for the Respond component (capability for contingencies) might then look as follows:

1. Top Level (strategy component)
   Respond (to contingencies)

2. Level 2 (scenarios)
   NEA
   SWA
   NEA & SWA
   NEA & Bosnia
   Bosnia
   Haiti
   Etc.

3. Level 3 (cases of scenarios)
   (under SWA)

¹The cases chosen for the scorecard reflected extensive scenario-space exploration such as described in Davis, Hillestad, and Crawford (1997).
Late reaction by U.S.
Restricted access to Persian Gulf
Long buildup
Etc.

4. Level 4 (measures of scenarios)
(under each scenario case)
Time to stop initial attack
Distance penetrated by enemy
Friendly casualties
Time to restore border
Time to defeat enemy and destroy warmaking potential
Etc.

A single DynaRank scorecard provides the capability to represent up to three of these levels of criteria. However, by linking subordinate scorecards it is possible to create as many levels of criteria as desired. For example, in the QDR work we used two levels of scorecard, with the first level representing all components of the QDR strategy and the subordinate scorecards representing cases of scenarios, measures of outcome, and other subordinate measures. We did not in fact address SSCs in our work.

The Shaping Component of Strategy

Environment shaping involves activities such as maintaining presence through carrier operations or in-place forces, development of alliances, joint training with allies, prepositioning equipment, basing agreements, and diplomacy. In addition, previous use of force that demonstrates the willingness to react and the maintenance of modern ready forces also shapes the strategic environment.\textsuperscript{2} We broke down shaping activities by region, type of activity, and measure of that activity. We did not include diplomatic actions that did not involve defense activities or structure.

\textsuperscript{2}This indicates that the strategy dimensions of respond, shape, and prepare now are not completely independent, so it is difficult to estimate how much of an option's costs should be allocated to the three components. For example, increasing forward naval presence contributes to both contingency capability and environment shaping. We credit both contributions, but we do not cost them separately. Some readers familiar with multi-attribute utility theory might argue that the objectives (strategy components) should be made independent so that separate costing would be possible. Others might argue that it is unfair to credit an option for its contributions in two categories, because that represents in some sense a “double counting.” Upon reflection, we decided to proceed as we have—avoiding one set of problems by not separately costing by strategy component, and deliberately choosing to “double-count or triple-count” when an option has value in more than one strategy component.
Under these assumptions, the hierarchy for shaping is as follows:

1. Top Level (strategy component)
   - Shape the security environment

2. Level 2 (region)
   - Europe
   - Central/South America
   - Africa
   - Mideast
   - Northeast Asia
   - Etc.

3. Level 3 (environment shaping activities)
   - Naval presence
   - Stationed forces
   - Basing agreements
   - Prepositioned equipment
   - Joint exercises
   - Etc.

4. Level 4 (measures of shaping activities)
   - Carrier days in region
   - Port visits by Naval forces
   - Other Naval presence (noncarrier activities)
   - Quantity of U.S. ground forces deployed
   - Quantity of U.S. air forces deployed
   - Etc.

The “Prepare Now” Component of Strategy

This dimension of strategy is concerned with actions to prepare the U.S. military for the future, in particular actions that go beyond preparing contingency capabil-
ity for scenarios that are being addressed more routinely under the “respond” component, which is largely oriented toward the midterm and currently identifiable threats. We have called this “strategic adaptiveness” and have considered the various aspects of the future that require us to undertake activities now. Force modernization is one aspect of this. As opponents develop new capabilities, such as modern precision weapons, accurate long-range missiles, and weapons of mass destruction, it is essential that U.S. forces be prepared to cope with them. First, modernization might be measured against futuristic scenarios, or more subjectively judged by degree of ability to cope with enemy technology advances or technology breakthroughs—against threats that go beyond what we can already see for the midterm. A second aspect of the future is the changing strategic environment. If base access is reduced or alliances disappear, it may be necessary for U.S. forces to operate from longer distances, perhaps even conducting operations from the continental United States (CONUS) or space. A third aspect that must be considered is the potential effect of alternative future defense budgets. It is possible, in the absence of strong actions by Congress, that entitlement spending will cause dramatically reduced defense budgets and that this will in turn cause large changes in force structure or, alternatively, if force structure is protected, this will curtail the ability of the forces to modernize. Certain actions taken now, such as reengineering Army brigades, Naval battle groups, and Air Force squadrons, might enable services to better withstand severe budget shocks. The criteria for the prepare now component of strategy are as follows:

1. Top Level (strategy component)
   - Prepare now (strategic adaptiveness)

2. Level 2 (component)
   - Technological adaptiveness
   - Strategic adaptiveness
   - Budget adaptiveness

3. Level 3 (component)
   - (Under technological adaptiveness)
     - Information warfare
     - Threats to space activities
     - Weapons of mass destruction
     - Etc.
   - (Under strategic adaptiveness)
     - Greatly reduced access to airbases and ports
     - Chinese dominance in NEA
(Budgetary adaptiveness)
Reducible infrastructure
Graceful reductions in force structure
Etc.

Typically, for our initial work we used subjective judgments about how the various modernization, force structure, and efficiency options would affect each of these criteria. It is possible that a more extensive effort could develop specific scenarios or cases and attempt to model or otherwise measure the extent to which certain options affect these criteria.

**DEFINING AND CATEGORIZING THE OPTIONS**

We considered as options a wide variety of programs calling for acquisition, reengineering, or reducing forces (or defense agencies). They included options to reduce Army, Air Force, and Navy force structure in various ways; options to acquire new capabilities such as advanced aircraft and tactical missile defense; and options to reengineer forces for additional efficiency or effectiveness or both. The options we evaluated were drawn from (but did not include all the ideas of) future vision documents of the DoD (Shalikashvili, 1996; Barnett, 1996; Defense Science Board, 1995, 1996; DDR&E, 1996), the Army (Army TRADOC, 1996); the Navy (CNO, 1997; and National Research Council, 1997), and the Air Force (O'Hanlon, 1995; MacGreggor, 1997), as well as informal discussions with experts and independent papers by outside analysts. We organized the options by whether their primary focus was force structure, modernization, or efficiency (which includes reengineering options). Figure 3.1 shows some of the elements of this categorization. By and large, the options were ones that seemed at least plausible by 2010, the nominal last year for our assessments. Informally, we have considered the 2020 era, but we do not discuss that analysis here.

Why did we choose this level of representation of the options? There are multiple reasons. First, many items involved the force elements being discussed during the QDR (e.g., carrier battle groups). Second, we chose some items based on the availability of cost and effectiveness data at this level of resolution and on the fact that many of these options were considered in previous analysis at RAND and elsewhere. Lastly, additional options were chosen to provide a reasonably broad coverage of the choices available to the services and DoD. However, we do not claim that the options were an exhaustive representation of those choices. We examined 60 options across the above categories.

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3We were also acquainted generally with ideas later published in the Strategic Assessment 1997 by National Defense University’s Institute for National Strategic Studies. Because of our midterm focus, however (out to perhaps 2010), we did not in fact represent some of the more radical restructurings well. Also we did not represent some of the ideas from other sources mentioned here that focus on the longer run and possible military peer competitors.
For most of our analysis, we used annualized costs of the individual options as the sole measure of cost. That is, we used only one cost dimension and that was obtained by amortizing acquisition costs over the expected life of the system, adding operating and support costs, and discounting future costs. This is admittedly crude, and certainly not enough resolution for programming choices, but was considered enough to allow us to obtain first-order estimates of cost for cost-effectiveness estimates. As a baseline, we used the 2001 Program Objective Memorandum (POM) forces and budget assumptions.

COST AND EFFECTIVENESS EVALUATION OF THE OPTIONS

We evaluated the options with a mix of quantitative and subjective models, and subjective judgments. Campaign models provided the MTW outcomes, games and

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TMD = tactical missile defenses.
CCBGs = contingency-capable battle groups.

Figure 3.1—Options Were Organized in Force Structure, Modernization, and Efficiency Categories

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4A subjective model explicitly identifies key considerations and distinguishes among cases. A "subjective assessment" might be something like assuming—without explanation—that a much smaller force structure, even if armed with high-technology precision weapons, would have serious problems in a protracted land war in Asia. Another example is assigning a high subjective value for a theater missile defense system because of the weapons of mass destruction (WMD) threat. We did not, in this particular study, actually use models to compute the consequences. In prior analyses and games, however, that subjective value was manifest.
expert judgment provided effectiveness estimates for capabilities in SSCs, simple presence models provided measures of presence for the shaping component, and subjective judgments were used to fill in the remainder of the scorecard. We used a hierarchy of scorecards to make the assessments so that contingency capabilities (MTW, SSCs, and multiple MTWs and SSCs) were represented in one scorecard, shaping activities were represented in another, and the aggregate results of these assessments were rolled up into a strategy scorecard and combined with subjective assessments of strategic adaptiveness in the main scorecard. Figures 3.2 through 3.4 show portions of the scorecards that were used for several elements of the hierarchy. Although the analysis was merely a prototype, and although we would now do a more in-depth analysis, the results were instructive and in some cases seemed credible.

Parts of the scorecards not shown include the cost dimensions (annualized costs), the remaining options, and the additional regions for the shaping scorecard. Each scorecard had an identical list of 60 options of the types described above.

**WEIGHTING MEASURES AND RANKING THE OPTIONS**

Utilizing these scorecards, we next examined the effects of weighting different components of the criteria in the different scorecards on the cost-effectiveness ranking of options. We attempted to determine whether there were robust options, ranking high regardless of the weighting, and whether there were options strongly dependent on weighting-specific scenarios, measures, or strategy components. We also used the approximate cumulative graphs to determine the accumulation of effectiveness and cost/savings as we selected the highest ranked options in order of ranks. The following are the general conclusions we reached by this process:

- The options in the efficiency category appear to be the most robust to changes in emphasis on criteria.
- The best modernization options address “Achilles' Heels” or make hard objectives feasible.
- The justification for modest reductions in active force structure is fairly robust where such options are politically feasible.
- Important strategic options involve reengineering.

**ROBUST CAPABILITIES**

We looked at the effect of varying the emphasis or the weighting of criteria on the cost-effective ranking of options. For example, the highest ranked options fell into the efficiency category. Figure 3.5 shows that with high weight on the shaping component of strategy and with equal weights on all components of strategy, most of the same options appear at the top of the list when ranked by cost-effectiveness. These types of comparisons can be shown using the DynaRank Rank display.
## Top Level QDR Scorecard

<table>
<thead>
<tr>
<th>Capability for Contingencies</th>
<th>Environment Shaping</th>
<th>Strategic Adaptiveness</th>
<th>Annualized Cost/Savings</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>SWA</td>
<td>E. Asia</td>
<td>2 MRCs</td>
<td>Tech</td>
</tr>
<tr>
<td>Poland</td>
<td>Late</td>
<td>Long</td>
<td>DPRK</td>
<td>China</td>
</tr>
<tr>
<td>Goal --&gt;</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Option No.</th>
<th>Option Description</th>
<th>Option</th>
<th>Wt</th>
<th>Wt</th>
<th>Wt</th>
<th>Wt</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>Double weapon effectiveness of 20 wings</td>
<td></td>
<td>100</td>
<td>64</td>
<td>96</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>12</td>
<td>Reengineered brigades</td>
<td></td>
<td>100</td>
<td>60.3</td>
<td>92</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>49</td>
<td>Reengineered brigades</td>
<td></td>
<td>100</td>
<td>60</td>
<td>92</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>28</td>
<td>C4ISR enhancements</td>
<td></td>
<td>100</td>
<td>90</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>27</td>
<td>TBMD</td>
<td></td>
<td>100</td>
<td>80</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>31</td>
<td>Double weapon effectiveness of 10 wings</td>
<td></td>
<td>100</td>
<td>64</td>
<td>94</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>20</td>
<td>AF prepo (2 theaters)</td>
<td></td>
<td>100</td>
<td>61</td>
<td>90</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 3.2—A Portion of the Main QDR Scorecard
## SWA Contingencies Scorecard

<table>
<thead>
<tr>
<th>Option No.</th>
<th>Option</th>
<th>Goal</th>
<th>Mid Level Criteria</th>
<th>Base Level Criteria</th>
<th>Top Level Criteria</th>
<th>Aggregate Column</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reduce 1 Army Division</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Reduce 2 Army Divisions</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-2</td>
</tr>
<tr>
<td>3</td>
<td>Reduce 3 Army Divisions</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-4</td>
</tr>
<tr>
<td>4</td>
<td>Reduce 1 Guard Division</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-6</td>
</tr>
<tr>
<td>5</td>
<td>Reduce 2 Guard Divisions</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-0.33</td>
</tr>
</tbody>
</table>

### Figure 3.3—A Portion of the Subordinate Scorecard Used for the SWA Contingencies

(See Plate IV for color illustration)
### Shaping Scorecard

<table>
<thead>
<tr>
<th>Top Level Measures</th>
<th>Europe</th>
<th>Greater Middle East</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mid Level Measures</th>
<th>Overseas Presence</th>
<th>Power Projection Capabilities</th>
<th>Security Alliances and Coalitions</th>
<th>Overseas Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Base Level Measures</th>
<th>Deployed Forces</th>
<th>Infrastructure incl. Prepositioning</th>
<th>Security Assistance Inc. FMI</th>
<th>OOTW</th>
<th>Rapidly Deployable Forces</th>
<th>Deployable within Months</th>
<th>Sustainability Forces</th>
<th>Operational Prowess</th>
<th>Cohesiveness and Planning</th>
<th>Deployed Forces</th>
<th>Infrastructure incl. Prepositioning</th>
<th>Security Assistance Inc. FMI</th>
<th>Overseas Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Option No.</th>
<th>Option</th>
<th>Deployed Forces</th>
<th>Infrastructure incl. Prepositioning</th>
<th>Security Assistance Inc. FMI</th>
<th>OOTW</th>
<th>Rapidly Deployable Forces</th>
<th>Deployable within Months</th>
<th>Sustainability Forces</th>
<th>Operational Prowess</th>
<th>Cohesiveness and Planning</th>
<th>Deployed Forces</th>
<th>Infrastructure incl. Prepositioning</th>
<th>Security Assistance Inc. FMI</th>
<th>Overseas Presence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reduce 1 Army Division</td>
<td>90</td>
<td>100</td>
<td>100</td>
<td>80</td>
<td>60</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>80</td>
<td>80</td>
<td>60</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Reduce 2 Army Divisions</td>
<td>82</td>
<td>100</td>
<td>100</td>
<td>80</td>
<td>60</td>
<td>100</td>
<td>100</td>
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<td>80</td>
<td>80</td>
<td>60</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Reduce 3 Army Divisions</td>
<td>82</td>
<td>100</td>
<td>100</td>
<td>80</td>
<td>60</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>80</td>
<td>80</td>
<td>56</td>
<td>80</td>
<td>60</td>
</tr>
<tr>
<td>4</td>
<td>Reduce 1 Guard Division</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>80</td>
<td>60</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>80</td>
<td>80</td>
<td>60</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

**Figure 3.4**—A Portion of the QDR Scorecard Used for the Shaping Component of Strategy
(See Plate V for color illustration)
Robustness of Efficiency Options (Shaded Options)

<table>
<thead>
<tr>
<th>Option Rank—High Shaping Wt.</th>
<th>Option Rank—Equal Wts.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Replace 3 CVBG with 3 CCBG</td>
<td>• Replace 3 CVBG with 3 CCBG</td>
</tr>
<tr>
<td>• Med home port for CVBG</td>
<td>• 12 Reengineered brigades</td>
</tr>
<tr>
<td>• Smart ship technology</td>
<td>• Med home port for CVBG</td>
</tr>
<tr>
<td>• 12 Reengineered brigades</td>
<td>• Reduce 3 Guard Divisions</td>
</tr>
<tr>
<td>• Reduce 3 Guard Divisions</td>
<td>• DOD Agency reduction</td>
</tr>
<tr>
<td>• DOD Agency reduction</td>
<td>• Larger AF Squadrons</td>
</tr>
<tr>
<td>• Larger AF Squadrons</td>
<td>• Smart ship technology</td>
</tr>
<tr>
<td>• ATBM</td>
<td>• .75 F22 Buy</td>
</tr>
<tr>
<td>• - - -</td>
<td>• Reduce ships in 3 CVBG</td>
</tr>
</tbody>
</table>

Figure 3.5—Comparison of Ranked Lists with Different Emphasis on the Strategy Components

Some options represented cost savings with essentially no effect on performance, while others improved performance and saved money. For example, the availability of a Mediterranean home port would not only improve the ability to maintain naval presence, but would also save money in terms of the number of carriers needed to provide the increased presence. A postulated reengineering of the Army to move to a corps/brigade structure with modern, smaller brigades and a smaller overall support structure could improve the ability to deploy quickly and mount a more substantial early defense at lower cost as a result of smaller manpower requirements. There might or might not be penalties for environment shaping, and there would be penalties in large manpower-intensive wars. Higher combat sortie rates for aircraft permit the same force to be more lethal and permit the job to be done with fewer deployed aircraft. These types of capabilities, while often showing small marginal improvements, are important because of their “win-win” nature and the fact that cumulatively, they can add up to large improvements in capability at a very reasonable cost. Figure 3.6 shows a DynaRank cumulative plot of option costs and effectiveness with the options added one at a time from left to right and with the highest ranked options by cost-effectiveness added first.

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5Obviously, adding a homeport would not have the same benefit as an additional battle group for fighting two long MTWs in which the United States lacked adequate land bases. However, we did not highlight such a case in our effectiveness measures because it seems relatively less important than the cases we used or than the ability to maintain peacetime presence. That, of course, is a judgment.
Figure 3.6—Efficiency Options Save Money and Often Improve Effectiveness as Well

Note that the options that improve effectiveness and save money are chosen first. Effectiveness builds up and savings accrue at the same time. Next, options that save money and do not reduce effectiveness are accumulated. Effectiveness stays constant while savings continue to accrue. It turned out that many of the options in this category are also efficiency options.

OBSERVATIONS ABOUT THE PROTOTYPE APPLICATION OF DYNARANK

DynaRank is just one of many possible tools for resource-allocation analysis of force structure and force capability. It is, however, the only tool we know of that can integrate the analysis of the contributions of capabilities to all components of the new defense strategy. And it is one of few tools that permits the direct integration of cost and effectiveness in the evaluation of many disparate policy options. It requires that the analyst be explicit about objectives and criteria and, in turn, it permits a dynamic, interactive investigation of the choices, allowing variation of emphasis on the criteria at any stage in the hierarchy of measurement from individual scenario outcome measure, to emphasis on scenario, to emphasis on strategy component. It permits the linkage of a detailed representation of an option to operations and ultimately to the high-level defense strategy. As such, it can be an information tool as well as an analysis tool, capturing what is known about linkages, performance, and costs.

The primary purpose of the tool is to assist the discovery of rationale about policy options and classes of options. Standard use includes looking for robust capabilities, attempting to identify the cases in which certain options are important, trying
to screen out some capabilities, and mixing performance with cost. We believe that DynaRank should be used in a dialogue with decisionmakers, allowing them to select the emphasis on criteria, observe the implications, and iterate the weighting to develop the rationale for a choice. The use of the tool is not about discovering the "correct weights" because we believe there are no correct weights. Rather, by examining the consequences of weights on strategy criteria, cases, scenarios, etc., it is possible to study the implications of emphasis. During use of DynaRank, we have observed decisionmakers who were intent on the emphasis of a particular criteria change that emphasis once they discovered the implications in terms of policy choices.

We have illustrated how DynaRank led us to certain tentative conclusions about policy choices during the period of the QDR and other projects. We believe that this is not a one-time analysis and the process must necessarily be ongoing as budgets change, new capabilities become apparent, or new threats, scenarios, and cases become important. Thus, we also believe that embedding this type of tool and process within DoD, perhaps as part of the PPBS process, is important to maintain the rationalization for the new defense strategy, protecting transformation process, and shaping activities as threats change, budgets decrease, or people attempt to protect force structure at the expense of modernization.

Finally, we note that our analysis was merely a prototype. In some cases we postulated both new forces and their effectiveness; in other cases, cost estimates were quite soft. Further, we did not really do justice to the issue of preparing for the longer term (e.g., 2020) or to the subtleties of environment shaping and strategic adaptiveness. Nonetheless, some of the conclusions seem robust and others at least point toward what should be checked in more depth. And, ultimately, it was a prototype effort without the benefit of close interactions with policymakers. In future experimental work, we intend to increase substantially interactions with policymakers, and with DoD and service staffs.