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Naval Research, Development, and Technology: Deciding What to Buy and How to Buy It

Concerns have been raised that the current draw-down in defense force structure has been accompanied by too slow a drawdown in infrastructure (assets devoted to research, development, technology, engineering, production, and support). Meanwhile, proponents of acquisition reform have questioned whether the various organizations within the Department of Defense (DoD) need to retain as much of their infrastructure *in house* as they have. In response, the Department of the Navy (DON) has been critically examining its infrastructure. A RAND research team led by Kenneth V. Saunders supported this effort in three ways:

- By proposing a framework for setting funding priorities among different lines (capabilities, categories) of research, development, and technology (RD&T) and applying that framework
- By reviewing the latest approaches taken by private-sector decisionmakers for determining which corporate functions to retain internally and which to shift to outside sources
- By combining the methods studied in the first two tasks as a way of drawing inferences about specific Naval facilities and organizations.

Saunders and his colleagues report on these tasks in *Priority-Setting and Strategic Sourcing in the Naval Research, Development, and Technology Infrastructure*. RAND's work on this Navy-funded project was encouraged and coordinated by the Office of the Secretary of Defense, which is interested in the generalizability of the approach and in the applicability of the resulting methods to science and technology investment policy across DoD.

SETTING PRIORITIES

The RAND framework for establishing Naval RD&T funding priorities consists of four steps.

Assemble a List of RD&T Capabilities. This step is not as straightforward a task as might be imagined. Should RD&T capabilities be expressed in terms of capabilities operationally relevant to the function or mission they support (for example, ballistic-missile defense), weapon systems supported (such as fixed-wing aircraft), or disciplines (such as naval oceanography)? After many attempts at different configurations of capabilities, the RAND list consists of 53 capabilities along all three dimensions. Such a "messy" classification scheme reflects the untidy choices facing decisionmakers.

Define Criteria. The RAND team selected two discrete criteria for setting priorities. The first criterion is the relative future value of a line of RD&T to the Navy, including the Marine Corps. That value might be seen as the contribution of the next dollar of funding to DON's ability to achieve success in various joint missions over the next 20 to 30 years. The second criterion is the expected future breadth of demand for the products of DON's RD&T infrastructure: *Narrow-breadth* lines of RD&T are those that only DON is interested in; generic, or *wide-breadth*, lines are those in demand across the public and private sectors.

Rank the Capabilities. RAND's project staff, aided by outside experts, took their best cut at ranking the 53 capabilities. Consensus was built through Delphi techniques, which involved iterations of "blind" (individual) assignment of scores followed by open discussion. The

resulting two-dimensional ranking of capabilities is shown in the figure. These RAND rankings should be viewed more as a starting point for debate within DON than as a recommended position. But three general trends can be discerned in the figure that would probably remain in an official Naval ranking:

- Most of the highest-value RD&T categories tend to be associated with the information revolution—with computers and communications.
- RD&T categories associated with classical combatant platforms (e.g., submarines) are not assigned the highest value, because current platforms are already so good and because greater leverage for the future can be obtained by focusing directly or indirectly on the advances in the weapons, sensors, communications equipment, computers, etc., they are expected to carry.
- Basic-research categories tend to be located toward the lower right, because great uncertainty is attached

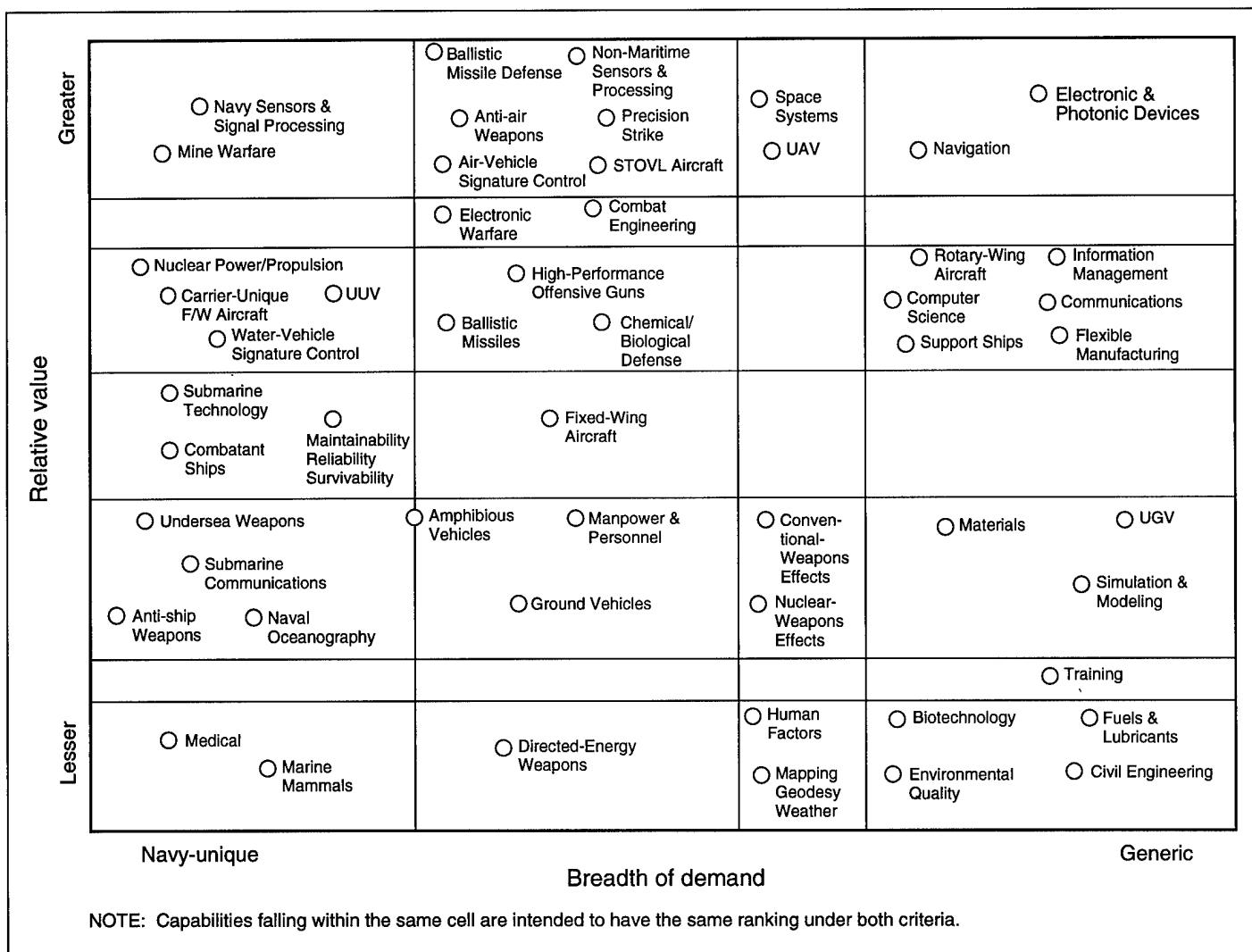
to when or where basic research will pay off—not to whether it will pay off (it will).

Establish Funding Priorities. Where the relative values of several RD&T capabilities are judged the same, the higher DON funding priorities would go to those that are Navy-unique, to ensure their continuation. Generally, funding priorities would be highest in the upper left part of the figure and lowest in the lower right, and would steadily decrease from upper left to lower right.

DEVisING NEW SOURCING STRATEGIES

Some lines of RD&T will undoubtedly fall victim to budget cuts, but others could be saved if more-economical ways of pursuing them could be found. One promising approach is *strategic sourcing*—deciding, with the fundamental goals of the organization in mind, how and where to obtain services.

To gain insights into the rationale and goals of strategic sourcing, the RAND researchers conducted case stud-



RAND's Ranking of Naval RD&T Capabilities

ies of two private-sector organizations—Eastman Kodak and Cummins Engine—forced to be more competitive and to cut costs. The Cummins case may be particularly pertinent to DON. In moving toward buying some parts instead of manufacturing them, senior Cummins decision-makers faced internal criticism that they were “hollowing out” the firm, that it would be difficult to decide what was so important that it could not be outsourced. These concerns revealed lack of a strategic framework, a failure to realize what corporate activities actually added value to the firm’s principal products. Decisionmaking had too often been an exercise in compromising among organizational constituencies, some of them peripheral to the central mission. Strategic sourcing led decisionmaking back to that mission—reason enough to implement this approach.

Other case studies—of the airline industry and of DoD compartmented programs—illustrate another aspect of strategic sourcing: the establishment of long-term, strategic relations with suppliers. Such relations are characterized by trust, an absence of micromanagement, and growth toward a partnership of common interests. Outsourcing services thus does not necessarily imply surrendering quality and reliability to cutthroat competition for low bids. Quite the contrary. In strategic sourcing, the organization searches for opportunities and means to get suppliers to participate in achieving its long-term strategic goals.

In some cases, it may not be enough to outsource RD&T. More advantage may be gained by stopping RD&T funding entirely and buying the eventual product off the shelf. This approach could have been taken, for

example, for various microprocessors and other electronic products, even though they may not have fully met military specifications. For such products, it may be worth asking what benefits those specifications yield and at what cost.

The success of any transition to more-strategic, more-flexible sourcing will depend on how that transition is effected. DON might consider transition aids used in the private sector, such as special temporary transition teams set up with decisionmaking power and responsibility. And, where infrastructure is given up, teams of experts could be retained in-house to ensure “smart” buying.

STRATEGIC SOURCING, THE PRIORITY GRAPH, AND THE RD&T INFRASTRUCTURE

Clearly, the criterion prescribed above for sourcing decisions—relevance to central mission—is related to the dimensions in the figure. Lines of RD&T that are most important to retain in-house would be those expected to contribute most to future Navy and Marine Corps missions and least likely to be sustained outside DON. Others might be candidates for outsourcing.

The figure could also provide guidance to decision-makers attempting to determine which facilities might have to be closed. Whereas lines of RD&T falling toward the upper left on the diagram need to be supported *somehow*, institutionally or physically coherent elements of the infrastructure (offices, installations, etc.) supporting capabilities toward the lower right may represent opportunities for savings.

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