

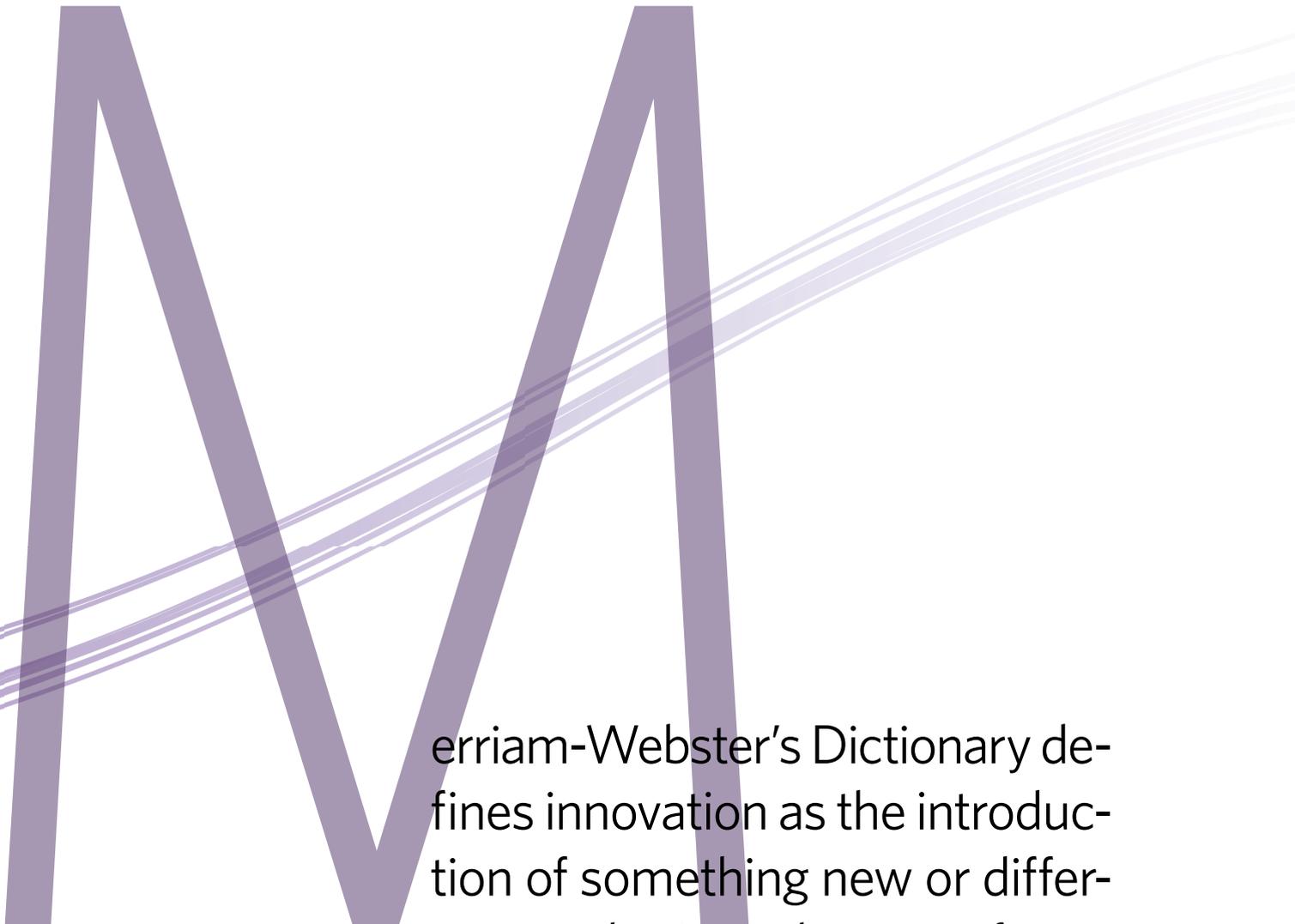
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Synergy
Innovation You Can Measure
Eugene A. Razzetti



A large, stylized purple letter 'M' is positioned on the left side of the page. Overlaid on the right side of the 'M' is a line graph consisting of several thin, light purple lines that trend upwards from left to right, suggesting growth or progress.

erriam-Webster's Dictionary defines innovation as the introduction of something new or different, or the introduction of new things or methods. DoD wants innovation both for and from its warfighters. But if you're a warfighter or program manager:

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- What does innovation look like?
- How do you know when you've been innovative?
- How do you know if the innovation (once identified) will do any good, especially if you're talking about spending a large amount of time and funding to develop it?
- How much good will it do for the amount of time and funding invested?
- How do you know that a gain in one area won't result in an attendant loss in another?

SYNERGY
A COMBINED ACTION OR OPERATION.
A MUTUALLY ADVANTAGEOUS
CONJUNCTION OR COMPATIBILITY
OF DISTINCT BUSINESS PARTICIPANTS
OR ELEMENTS (AS RESOURCES
OR EFFORTS).
MERRIAM-WEBSTER

- Redundancy: Wherein several organizations perform similar activities to achieve the same objectives; leading to
- Commonality: Wherein several organizations perform the same activities to achieve the same objectives; leading to
- Synergy: Wherein one organization, by doing one activity for several similar organizations, achieves more than could be accomplished

by all the similar organizations each doing the same activity.



Too often, acquisition processes stop at commonality, confusing it with both innovation and synergy. Defense acquisition has come too far, and DoD's need is too great to be content only with commonality. Commonality is a poor substitute for either synergy or innovation.

Synergy versus Innovation

Further in the dictionary, Merriam-Webster defines synergy as the combined or cooperative action of two or more stimuli for an enhanced effect. It means that the whole becomes greater than the sum of its parts, and that one plus one can equal 2.5.

In business, synergy can mean that when separate departments within an organization cooperate and interact, they become more productive and efficient than if they had operated separately. For example, it is more efficient for each department in a small organization to deal with one finance department rather than each requiring a finance department of its own.

We can work more effectively with synergy than with innovation because synergy can be quantified, whereas innovation (if not the result of pursuing synergy) often cannot. In this article, I discuss synergy in general and representative synergies for the warfighter in particular, and I discuss how to look for synergies and how to measure their effectiveness. I also attempt to prove that the pursuit of synergy is of greater practical value than the pursuit of innovation.



What is required for the identification of synergies, above all, is a mindset from program managers that says one and one must equal 2.5, or it's not worth doing.

Evolving Synergy

Redundancy ⇌ Commonality ⇌ Synergy

In the development of synergies, the program manager and the program management office must look for three progressively supporting behaviors:

How Do You Know It's Synergy?

For our purposes in defense acquisition, synergy refers to the measurable behavior of whole systems not predicted by the behavior of their component parts taken separately. Synergy can play a vital role in planning and financing the conduct of modern warfare. DoD deals with how (and to what degree) the department should integrate those capabilities and assets of diverse component commands,

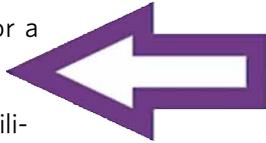
INNOVATION AND CREATIVITY NEED
TO MEASURABLY PROVE THEMSELVES
AT THE EARLIEST STAGES OF THE
ACQUISITION PROCESS, BEFORE
VALUABLE TIME AND FUNDS ARE
ASSIGNED TO THEIR FRUITION.

and how combining the capabilities can create something greater than their total.

In the same way, DoD must plan the integration of cultures as it plans for the cooperative success of U.S. and coalition forces. That will likely require a reasonable amount of time for the component commands to work together and achieve a cultural end state that reflects the goals of the commander.

Successful synergistic culture change builds upon the strengths of the components.

DoD has the potential for a high degree of synergy. However, in terms of population, assets, and capabilities, its optimization remains elusive.



DoD must develop or combine its material and non-material assets synergistically to achieve and maintain optimal performance of systems and maximum safety and effectiveness for warfighters.

Likely Synergies for the Warfighter

The warfighter and the program manager need to identify synergies across the entire spectrum of operations. The development of courses of (corrective) action requires both synergies potentially realized from the proposed courses of action implementation and the metrics needed to meaningfully evaluate them. The following are synergies that I recently developed to further assess courses of action for a major Navy command.

Enhanced Survivability

Enhancing survivability means quantifiably reducing the risk of loss of personnel and equipment as a result of:

- Development of and qualification in uniform operating doctrine and procedures
- Comprehensive weapons training programs
- Improved personnel protective equipment (e.g., body armor)
- Greater equipment reliability and reduced down time
- Greater speed/maneuverability over land or water.

Force Multiplication

Force multiplication refers to small forces doing the work of larger forces, or of forces with different specializations. An example is the use of barrier materials/equipments or perimeter sensors to preclude stationing of personnel, allowing small numbers of personnel to guard or monitor large areas.

Operational Reach

Operational reach is the distance over which military power can have mass effects and be employed decisively. It may be influenced by the geography surrounding and separating the opponents. It may be extended by locating forces, bases, and aggressive logistics resupply; by increasing the range of weapons systems; or by maximizing the use of the host nation and contract support.

Like-Process Consolidation

For purposes of this article, like-process consolidation means taking processes that have been done by a number of commands and assigning them to a single command or organization. Areas of like-process consolidation in anti-terrorism/force protection include:

- Perimeter security and sentry assignment

TOO OFTEN, ACQUISITION PROCESSES STOP AT COMMONALITY, CONFUSING IT WITH BOTH INNOVATION AND SYNERGY.

- Weapons training
- Operations or command centers
- Replenishment and resupply
- Personnel training and administration
- Operational reporting.

Metrics—Quantifying Synergy Effectiveness

What can't be measured can't be managed.

Paraphrased quote from social ecologist Peter Drucker

As warfighters must have the ability to objectively measure the success or failure of their operations, so must program managers be able to measure or quantify the potential profit or loss from intended procurements. They must be able to measure the components of the acquisition and compare their findings against established standards.

Applying specific metrics to the acquisition allows program managers to:

- Optimally plan the entire acquisition based on mission requirements and available resources
- Establish competition goals
- Evaluate programs while still in progress and assess the ability of the program to meet established goals
- Highlight specific areas for additional support or focus.

Table 1. **Subjective Synergy Metrics**

Metric	Desired Movement /Change
<i>Intelligence collection and dissemination accuracy</i>	Increase
<i>Risk/vulnerability</i>	Decrease
<i>Detection and reporting accuracy</i>	Increase
<i>Connectivity</i>	Increase
<i>Assessment of preparedness</i>	Increase
<i>Mission accomplishment</i>	Increase
<i>Maintenance of situational awareness</i>	Increase
<i>Accuracy of scanning and other electronic sensors</i>	Increase
<i>Weather prediction accuracy</i>	Increase
<i>Fallout and decay prediction</i>	Increase



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Tables 1 and 2 describe core subjective and objective metrics that measure the potential effectiveness of identified synergies.

Subjective Metrics

Subjective metrics, such as those in Table 1, are observable but not quantifiable in terms of hard numbers, such as miles per hour or hits per gun per minute.

Objective Metrics

Objective metrics, like those shown in Table 2, are more easily recognized, understood, documented, and defended in the acquisition process.

When to Employ Identified Synergies

There have been many long and scholarly books on the subject of strategic planning, in which top management inventively implements previously developed goals and objectives, but comparatively little on the actual creation of that strategy. Employment of identified synergies should occur as early as possible in the strategic planning (i.e., the acquisition) process, once the gaps and risks have been identified, as shown in Figure 1.

Regrettably, program managers may have little or no control of initial threat and assessment and during strategic planning. Thus, synergy identification may not occur prior to commencement of the acquisition process. It then becomes imperative to identify and employ the synergies and their associated metrics at the earliest point in the acqui-

Table 2. **Objective Synergy Metrics**

<i>Metric</i>	<i>Desired Movement/Change</i>
<i>Response times (hours)</i>	<i>Decrease</i>
<i>Equipment downtime/time degraded (hours)</i>	<i>Decrease</i>
<i>Speed of movement (miles/hour)</i>	<i>Increase</i>
<i>Throughput (pieces/hour)</i>	<i>Increase</i>
<i>Situational awareness/common operational picture (square miles)</i>	<i>Increase</i>
<i>Commonality/interoperability (instances)</i>	<i>Increase</i>
<i>Unit costs (dollars)</i>	<i>Decrease</i>
<i>Delivery times (hours)</i>	<i>Decrease</i>
<i>Required training time (hours)</i>	<i>Decrease</i>
<i>Route distances (miles)</i>	<i>Decrease</i>
<i>Decontamination time (hours)</i>	<i>Decrease</i>
<i>Personnel casualties (personnel)</i>	<i>Decrease</i>
<i>Extent of operational disruption (days/hours)</i>	<i>Decrease</i>

sition process in order to shape and control technology development.

The synergies and their associated metrics should be locked in during concept decision and revisited throughout the acquisition process. The program manager needs a robust, pre-approved set of synergies and metrics in order to shape concept design, and to direct and limit technology development. Synergies also provide continuing guidance and feedback during the systems acquisition and sustainment stages, providing decision (i.e., go/no go) criteria for milestones A, B, C, and for initial operating capability and final operating capability.

Synergy + Metrics = Objectives

Implementing synergies begins with aligning them and their associated metrics with the gaps or shortcomings to be addressed in the acquisition, and developing the objectives of the acquisition. The threat and risk assessments (see Figure 1), if properly conducted, should provide the required specificity for identifying the requirements and the synergies, and for planning the acquisition.

Let's assume that we need a watercraft to perform two related missions. One mission requires a maximum sustained speed of only 15 knots. The other mission requires a maximum sustained speed of 25 knots. (Note: The two speeds are for demonstration only and do not reflect any actual programs or analyses.) A watercraft capable of 25 knots is capable of performing both missions. The proper analysis by operators and engineers determines that a single watercraft capable of 25 knots can perform both missions. The development of a watercraft capable of 25 knots is now a defensible objective (or top-level requirement) for program

PROGRAM MANAGERS MUST IDENTIFY AND IMPLEMENT POTENTIAL SYNERGIES AS EARLY AS POSSIBLE FOR SYSTEMS YET TO BE DEVELOPED.



A Different Mindset

The intent of this article has been to stress the importance of the synergy mindset in warfighters and program managers. My intent is not to trivialize the importance of innovation or, for that matter, creativity. The lesson learned should be never to settle for redundancy or commonality. Innovation and creativity must measurably prove themselves at the earliest stages of the acquisition process, before valuable time and funds are assigned. Innovation must be subjected to the rigors of structured analysis, the most exacting of which is determining what synergies are created or satisfied, and to what degree.

Program managers must identify and implement potential synergies as early as possible for systems yet to be developed. Moreover, they must develop or combine existing material and non-material assets synergistically. Any less of a commitment from DoD impairs our ability to achieve and maintain maximum performance from systems and to ensure maximum safety and effectiveness for the warfighter.

If the innovations are worth the doing, they will survive the scrutiny of the synergy identification process. And be welcomed.

The author welcomes comments and questions and can be contacted at generazz@aol.com.

Figure 1. **The Role of Synergy Identification in Strategic Planning**

