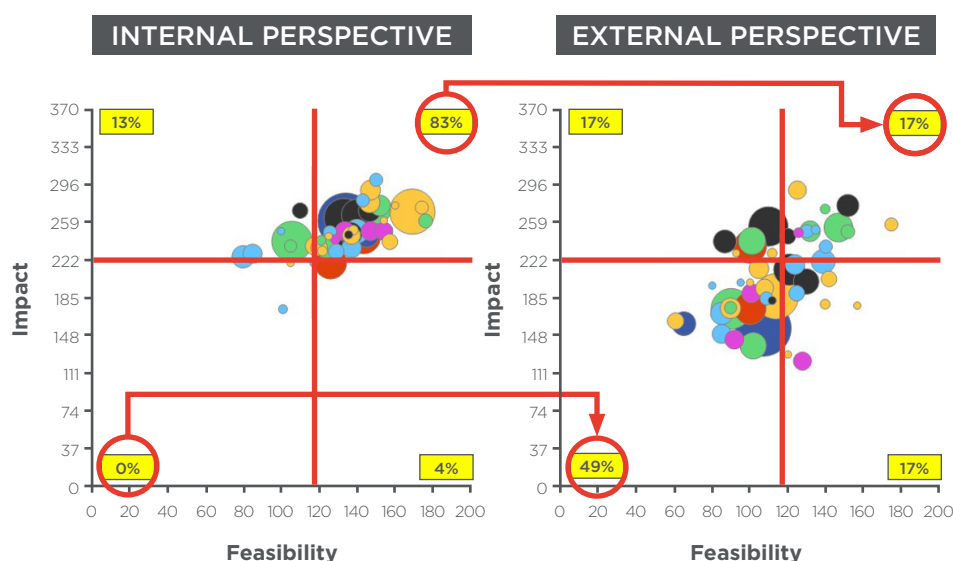


## GOVERNMENT

# R&D EVALUATION AND ROI NEED NOT BE MUTUALLY EXCLUSIVE CONCEPTS

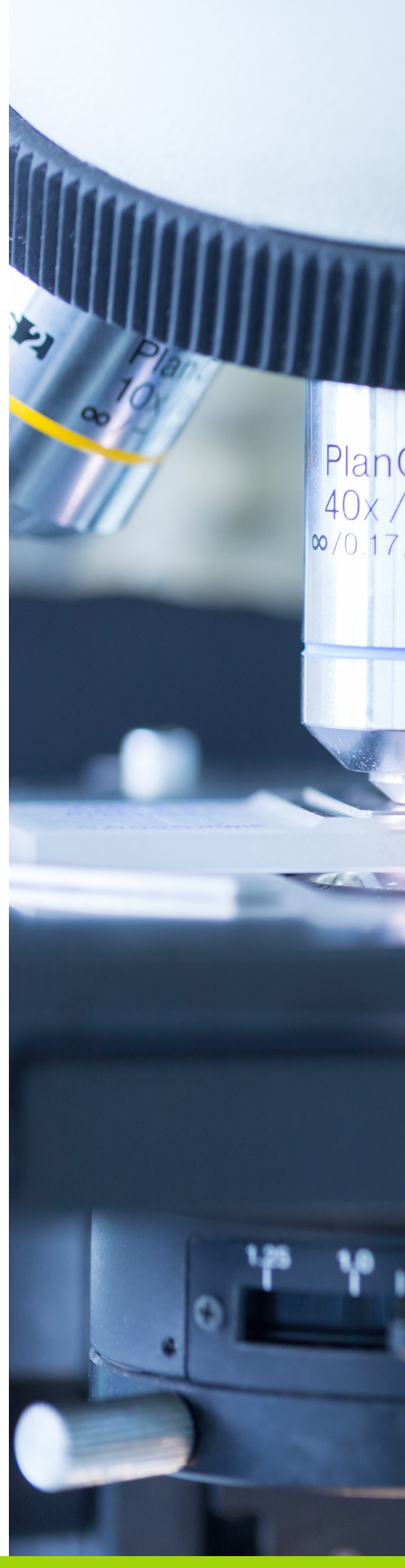
After 20 years of evaluating research and development (R&D), I've learned a thing or two. The most notable lesson? Organizations are completely and irrefutably incapable of assessing the value and risks of their R&D. I've known this for a long time, but occasionally I am faced with a situation that reinforces the lesson. Take, for instance, the plots below based on a multivariate analysis.



Analysis is designed to provide insight into the risk and reward balance of the investment portfolio. In the plots above, axes are composed of multiple strategic criteria with client-assigned weighting factors. Target performance for each criteria serves to generate the four quadrants of the portfolio plot. Individual R&D programs are shown as bubbles.

There is nothing wrong with either the math or the evaluative method itself. The problem is bias. Interpretation of these plots is an art that could easily become a Ph.D. dissertation, but the bottom line is, for organizations wishing to make an impact or drive return on investment (ROI), one good way to do so is to invest in R&D programs that fall in the upper-right quadrants (high impact/high feasibility) of the above charts. The yellow percentages represent the amount of investment in the programs in each quadrant, so you begin to see the problem when you compare the internal and external perspectives. Internally, the organization thinks it has 83 percent of its investment on target. Externally, business, R&D, and technology/domain subject matter experts think the reality is closer to 17 percent – a very significant difference.

Of even greater concern is the investment in the bottom-left quadrant. These are efforts that not only have limited impact, but actually carry significant risk. Internally, the analysis points to no investment in this quadrant. According to the external review, however, almost half the organization's investment is located there.



Another lesson I have learned is that neither perspective is completely correct – the reality lies somewhere between the two. However, many organizations either don't subscribe to this reality (“What could others possibly know about our portfolio?”) or they give it only lip service, with token external participants invited into their evaluation process – ideally, people who will toe the party line.

Unfortunately, many R&D organizations fall into this trap – unable to improve the efficiency of their investments because they are unable or unwilling to look at their portfolios with a critical eye. This is a shame, not just for the loss of intellectual rigor, but, more importantly, for the magnitude of the financial catastrophe that it represents. Ponder for a moment the following: If you assume that investments in the bottom-left quadrant will ultimately fail due to technical risk, product margins, competition in the marketplace, or any number of other reasons, and you conservatively estimate that 30-40% of R&D organizations suffer from internal bias, then billions of dollars are being wasted.

The country can't afford this type of loss. At a time when we are scraping for every additional dollar to pay for hugely expensive and increasingly pressing capability or product developments, we can't afford to throw half of every investment dollar away.

One approach to solving the problem are independent reviews – or what are often called Red Team reviews – with subject matter experts (SMEs) whose job it is to test assumptions, review risks, and assess the realism of success. A Red Team is designed to raise “red flags” when they have concerns – thus the name. Red Team Reviews should not be convened by the organization involved, because it will inevitably stack the deck with people known to the organization and who can be counted on to sugarcoat the results.

A CEO or chief technology officer faced with the above analysis has clear decisions to make. I can imagine questions like, “Why are we making these investments? What can I salvage? Whom can I trust? How do I use this to fix my problem?” But here's the thing – while pointing to issues of bias, the above analysis nevertheless has power because it provides the clues that hint at solutions. At least this CEO knows he or she has a problem, because he or she can read the chart on the right. CEOs in organizations that only have the chart on the left have an even bigger problem, plus he or she is not even aware the problem exists.

For the CEO examining both charts, the solution is simple – it's called “Vector Analysis.” Imagine plotting both the internal and external views on the same chart and then drawing a vector between the two data points for each program. The length of the line represents the degree of disagreement and the slope of the line represents the nature of the disagreement. Astute analysts can unpack both attributes and identify major points of disagreement and why that disagreement exists. Armed with this information, decision-makers can agree on specific corrective actions that will improve the situation. Actions can run the gamut from project termination, restructuring, focused investigation of particular concerns, and so forth. Over time, the portfolio can be reconfigured and repositioned.

R&D budgets are tight and the results of R&D programs are critically important in an increasingly complex world. R&D organizations must move beyond parochial bias and embrace intellectual rigor and honesty – there is only one path to that end, and that is through external and independent review. There is a metaphor used in the defense industry that describes bias as a “self-licking ice cream cone.” CEOs and CTOs that rely on their internal R&D portfolio management teams, processes and enterprise systems to conduct R&D evaluations, are running the very significant risk that what they will get is a self-licking ice cream cone. We see this time and again, as in the real example shown in the charts above.

Navigant's R&D management professionals have worked for years with defense, homeland security, life science, and space communities to provide objective and independent reviews of billions of dollars of R&D investment. We estimate that only one-in-five R&D organizations conducts a truly objective portfolio review, and yet, many CEOs wonder why their portfolios are not generating more value. The solution is straightforward: conduct an independent review that acts to supplement internal reviews. Both are necessary, and decisions made based solely on internal processes (even well-intentioned ones involving external customers and SMEs) will ultimately result in a suboptimized portfolio and one that disappoints in terms of ROI or transitions of new capabilities.



## CONTACTS

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