



Opportunity Cost Vs. The Cost of Opportunities

David Matheson

SMARTORG®

99 Almaden Blvd., Suite 975
San Jose, CA 95113
T: +1.650.470.0120 | F: +1.650.328.1612
info@smartorg.com |
www.smartorg.com

Key Takeaway: Understanding the costs of your available opportunities – in difficulty, time and money – is the key to assessing the opportunity costs of your portfolio choices.

One of the biggest factors in valuation of an innovation portfolio is opportunity cost. Because of scarcity of resources, it's rare that an organization can vigorously pursue all of the innovation opportunities it comes up with. Unless you have sufficient management bandwidth, technical capability, time and money to execute every idea in your innovation portfolio, you will only be able to fully pursue some of the projects.

SmartOrg uses several tools to compare projects by cost, difficulty, and potential return. Some of these tools apply to single projects, to enable comparisons of different approaches to generating value.

OPPORTUNITY COSTS WITHIN INDIVIDUAL PROJECTS

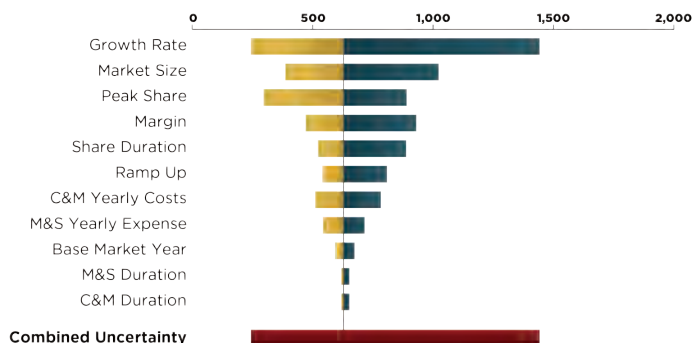
Opportunity cost is the value given up when we make one choice instead of another. But choices are not just between different things: you must also choose between different approaches to pursuing a single thing. Within a given project, you have a number of different choices that can lead to very different outcomes. By focusing on the uncertain factors that drive the upside of a project, a team can often develop ways to dramatically increase its value.

Udi Chatow, Business Manager at Applied Materials, offers advice based on his experience both at Applied and at HP. He says, "Ask yourself, 'what can I do to maximize success of my program?'" The critical steps to answer that question are:

1. Working through the potential strategies
2. Creating and understanding the proof points
3. Creating learning plans to pull in the big risks as early as possible
4. Be ready to pivot

Find Strategies to Exploit Upside Factors

The Tornado Chart, so named for its appearance, shows the overall range of the project valuation based on the uncertainties of different factors.



The bars show how each factor's uncertainty compares with the others'. The factors with the longest bars have the greatest sensitivity and therefore impact on the overall project valuation.

Moreover, the bars that extend furthest to the right represent the factors with the greatest potential for moving the project value to the upside. These are the areas where the portfolio and project managers can focus attention and resources to transform the project and exploit its upside potential. Choosing to play it safe and manage a project for low risk and mediocre returns incurs the opportunity cost of missing the potential upside. On the other hand, taking big risks in hopes of bigger rewards can lead to a failure that incurs the opportunity cost of the returns from the low-risk approach. There is a way to balance the two and drive upside potential without undue risk.

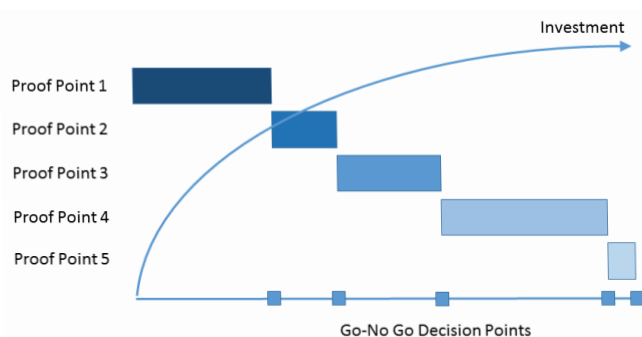
Once you have identified the uncertainty factors in a project., for each factor, identify the issues that drive upside and downside. Assess the quantitative range on each (the 10-50-90 range, or quantities with a 10 percent, 50 percent and 90 percent likelihood of occurring). From these, you can create a tornado diagram, with the broadest ranges on top and the smallest on the bottom.

Focus your attention on the top uncertainties, and create ideas on how to drive upside (and avoid downside). What steps can you take or what data must you collect to push each factor to the higher end of its range? Initiate learning plans around these ideas.

Create Learning Plans Based on Proof Points

Often teams only work on things in their comfort zone or design projects around showing accomplishments. Move beyond execution plans: use learning plans to humbly pursue really big ideas.

The learning plan lays out the proof points in the sequence in which you will investigate them. The order is important: starting with the hardest proof points helps you avoid going down the path of confirmation when a showstopper lies in wait for you.



Each proof point leads to a go-no go decision. If a proof point fails, there is no sense in continuing with the learning plan as originally laid out. That's the time to re-examine the vision and determine whether there's a viable alternative vision to pivot to. If not, it's time to cut your losses and redirect your resources and focus to another opportunity.

1. Define one or more big visions for the project, even ones that may be a little unrealistic.
2. Identify proof points: what evidence would you need to see to believe the vision is achievable? Look at the problem outside-in, staying away from your areas of strength.

3. Assess the difficulty (probability of success and required investment) of demonstrating each proof point. Order the proof points from hardest to easiest to demonstrate.
4. Start with the hardest ones. Construct a learning plan to deliver evidence on the hardest proof points as cheaply and quickly as possible. As Udi Chatow points out, failing too late wastes time and effort, and failing early lets you redirect your resources to other opportunities faster.
5. As the learning plan delivers each proof point, double down. If a learning plan fails to deliver a proof point, abandon it or pivot it to an alternative vision.

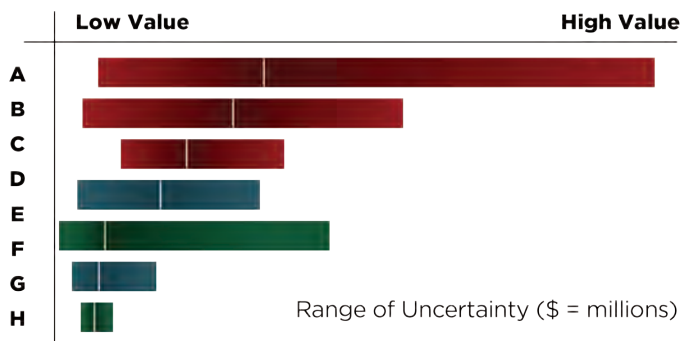
OPPORTUNITY COSTS WITHIN A PORTFOLIO OF PROJECTS

Organizational FOMO (Fear Of Missing Out) can make it difficult for an innovation portfolio manager to choose which projects to pursue and which ones to set aside. The projects that don't get your full commitment will either be set aside completely or, worse, be underfunded and understaffed, never getting the resources necessary to reach either success or failure. It's usually straightforward to understand the cost of opportunities you pursue, but sometimes you can lose sight of the opportunity cost of the portfolio choices you make.

De-Clutter and Dynamically Focus

One view of the projects in an innovation portfolio is a Significance Ranking. Each bar in the chart represents the range of value of a single project, where the range is determined by the combined uncertainty in the success factors of that project. (These correspond to the Combined Uncertainty bar in the project's Tornado Chart.) The thin white line in each bar is the most likely value. In this example, the most likely value of Project A is the largest of the portfolio projects, but more significantly, the potential upside of Project A stretches far to the right. With a well-crafted and executed Upside Exploitation Plan,

the actual value of Project A could be more than the combined value of Projects E, F, G and H.



Note that each project, regardless of its significance, requires a certain amount of management attention to pursue. Managing Projects E, F, G and H takes away from the attention available to manage Project A for maximum upside. The champions for small projects may not see the opportunity cost from not redeploying their efforts to higher-growth projects. However, you can see that Project F also has a big upside; finding a way to pivot this project toward that upside can make it more valuable than Projects C or D. Set aside less significant projects – or pivot them to more growth – to reduce your portfolio’s opportunity cost and increase its overall value.

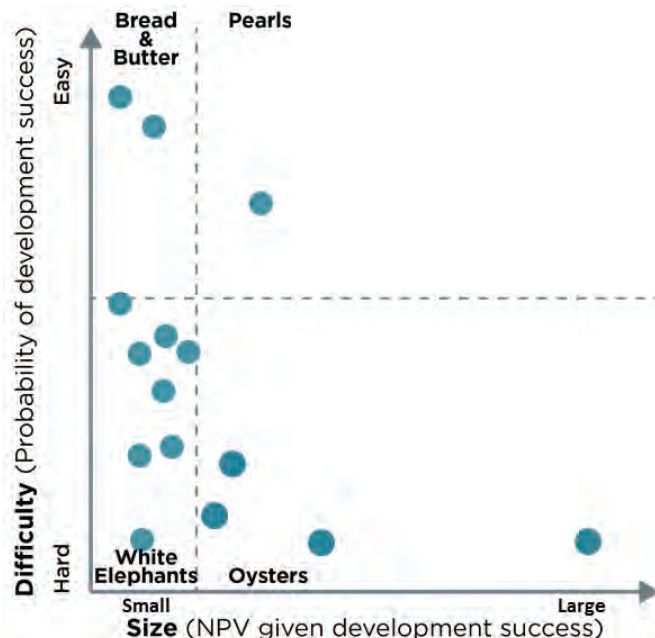
Fit Your Portfolio to Its Difficulty and Resource Allocation Profile

Scarcity of technical resources, such as engineering and marketing hours, affects each project’s chances of technical success, its potential value, or both. To be pursued vigorously, each opportunity requires technical resources such as engineering and marketing hours. Given the resources and time available, each opportunity has characteristics that affect the probability that the opportunity will successfully yield a new product or feature that generates revenue. Each project in an innovation portfolio can be rated on a difficulty scale from easy to hard, based on the estimated probability that the development will be successful.

If difficulty is an estimate of the project’s risk, mar-

ket-adjusted net present value (NPV) is an estimate of its reward. The NPV of a project – given the assumption that the project is successfully developed – comes from a model of the project’s commercial impact: cost of goods sold, average selling price, unit volumes over time, etc. SmartOrg teaches its clients to incorporate ranges of uncertainty for each of these model factors and use Tornado Charts to see both the market-adjusted NPV and the high and low ranges of value.

Plotting the difficulty against the market-adjusted NPV for each project in the innovation portfolio gives the Innovation Screen by Difficulty. Difficulty level and effort level are two different things: sometimes, an easy project with a high probability of success may still take a lot of time and money. Easy either means there are fewer proof points required to demonstrate success, or the proof points already have evidence for success. At the top of the Innovation Screen by Difficulty are easy projects; at the bottom are difficult projects that may not pay off. To the left are projects with low NPV; to the right are projects with higher expected returns.



SmartOrg has named the four quadrants of the Innovation Screen by Difficulty:

- Small, easy projects are the organization's Bread and Butter
- Small, difficult projects are White Elephants
- Large, easy projects are Pearls
- Large, difficult projects are Oysters (which may create Pearls)

Oysters seem to be less desirable than Pearls, but appearances can be deceiving. While Pearls are reliable sources of high returns, it turns out that you need to cultivate a lot of Oysters to create the next crop of Pearls.

Pursuing White Elephant projects creates opportunity cost in the form of resources that could be used to drive growth through creating and cultivating Oysters. Examine each White Elephant project to determine if it can pivot to be a high-potential Oyster; if it can't, cancel it and redirect those resources to other projects to increase the overall upside potential of the portfolio.

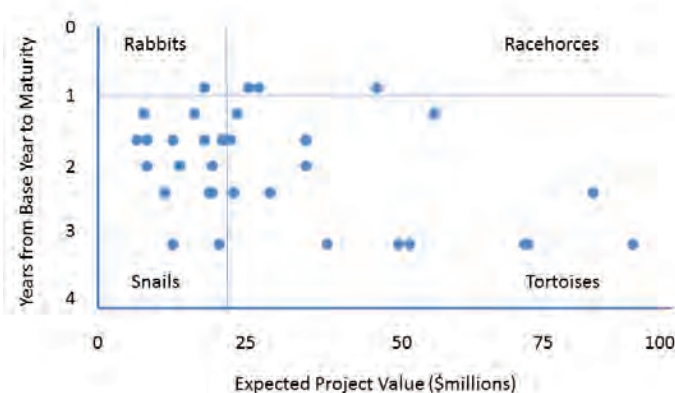
Shawn Williams, Vice President of Research and Development at Rogers Corporation, applied these principles to Rogers' innovation portfolio. He identifies two key factors in opportunity assessment: seeking upside potential and being mindful of follow-on or derivative development. He also says, "Culling the portfolio is a necessary component of success." By reducing clutter and seeking to maximize the upside of each project, he was able to transform the portfolio in stages from the beginning of 2016 to the end of 2017, increasing its potential revenue generation by 120%.

Recognize the Time Value of Money

The second key tool is the Innovation Screen by Time. CFOs are familiar with cash velocity, the rate at which cash invested in business operations generates revenues and billings that replenish that cash. The same principle applies in innovation. Some projects require a few months to turn R&D investment back into cash-generating innovations; others may take years. A small-return project that com-

pletes quickly frees up investment dollars for the next project: the quick turnaround boosts cumulative returns and generates the funds for new innovation investment. Conversely, a small-return project that ties up funding for years creates the opportunity cost of preventing you from conducting several small projects in the same span of time.

Plotting the time to maturity against the NPV for each project in the innovation portfolio gives the Innovation Screen by Time. At the top of the Innovation Screen by Time are projects that mature quickly; at the bottom are projects requiring a longer time to pay off. To the left are projects with low NPV; to the right are projects with higher expected returns.



SmartOrg has named the four quadrants of the Innovation Screen by Time:

- Small, fast projects are Rabbits
- Small, slow projects are Snails
- Large, slow projects are Tortoises
- Large, fast projects are Racehorses

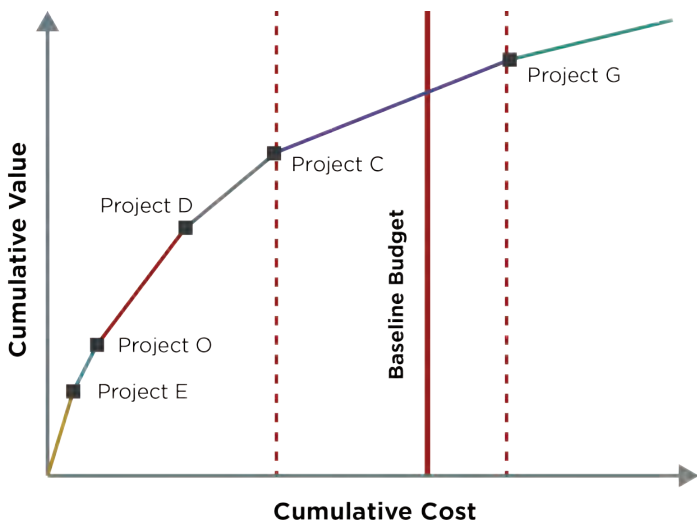
Investment dollars you devote to an innovation project get locked up until that project results in a product or feature that starts earning revenue. The longer the time to maturity, the longer those funds are locked up and unavailable to fund anything else. With all other things being equal, you want to fund Rabbits rather than Snails and Racehorses rather than Tortoises.

However, other things may not be equal. If a large project is a Tortoise (slow) but also a Pearl (easy), it may be more valuable than an equally large Race-horse that is a difficult Oyster. A guiding principle for using the Innovation Screen by Time is to try to speed up difficult projects by structuring them such that if they fail, they fail quickly. Failing quickly helps you avoid wasting more resources on a losing cause, and it gives you time to pivot to another approach or another project with a greater chance of success.

Invest Efficiently

Opportunity cost also stems from scarce financial resources. Fully funding one project over another means incurring the opportunity cost of forgoing the second project. However, fear of incurring the opportunity cost of cancelling some projects outright often leads to too many underfunded projects.

Because underfunding can lead to failure of projects that would otherwise succeed, this strategy often has a greater opportunity cost than committing to some projects and cancelling the rest. The CFO Chart helps in allocating the budget efficiently by ranking projects by their ROI, or return to cost ratio. In the example, the budget is sufficient to fund Projects E, O, D and C, and no other combination would yield greater total value. The vertical lines indicate that management can choose to cut the budget to just fund those four projects without losing potential value, or choose to increase the budget to capture the value from funding Project G.



OPPORTUNITY COSTS SHOULD DRIVE PROJECT AND PORTFOLIO PIVOTS

For stakeholders to support decisions driven by an opportunity cost mindset, you must create a culture where people don't see getting their projects cut as a failure. The keys to such a culture are credibility and comparability. When projects are evaluated objectively and on a consistent basis of comparison, stakeholders can agree that the evaluations are fair. Even if the project owner doesn't like the decision to cancel a project, that owner can accept the decision because it was made fairly on objective evidence.

Understanding the costs of your available opportunities – in difficulty, time and money – is the key to assessing the opportunity costs of your portfolio choices. With the proper tools and training, you will gain the capability to understand the drivers of value in each of your projects, to find and unlock upside potential, and to make the most of your opportunities while minimizing your opportunity costs. You can identify which projects are worth pursuing and which ones should be set aside. In this way, you will make changes that boost the power of your portfolio to deliver breakthrough growth.

Webinar Replay: You can see the replay of the May 15, 2018, webinar “Opportunity Costs Vs. The Costs Of Opportunities” here. The webinar, sponsored by SmartOrg and KNect365, features David Matheson of SmartOrg, Udi Chatow of Applied Materials, and Shawn Williams of Rogers Corporation.

© 2018 SmartOrg, Inc.