Managing Innovation Portfolios

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An InnovationLabs White Paper
Version 3, February 2010
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Companion to the white paper:
Innovation Metrics
The Innovation Process and How to Measure It
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Purpose

The purpose of an Innovation Portfolio is to manage the risk inherent in innovation while optimizing the results achieved by innovation investments. As this is an approach that only makes sense in the context of the specific markets in which a given company competes, and in relation to the technology that prevails in a given industry, each company’s Innovation Portfolio will necessarily be different.

This document describes a process recommended for Innovation Portfolio management, defined as a series of key concepts that may be implemented in steps.

The “Innovation Portfolio” Concept

Applying the concept of portfolio management for innovation is identical to portfolio management for any other form of investment. The principle underlying any investment portfolio is that the inherent risks and potential rewards have to be evaluated in conjunction with one another. By allocating capital across a range of investments, the goal is to obtain the best return while controlling risk. The key, as articulated in portfolio theory, is that the risks taken must be non-correlated, meaning that various investments selected must perform differently under every specific set of economic or business conditions.

The particular challenge related to innovation portfolios is that the projects – investments – to be decided upon are never complete or mature, and so their future value is highly uncertain. Stocks represent companies that have histories which can be studied; bonds are backed by organizations that have ratings; real estate can be appraised according to accepted methods. But innovation portfolios consist largely of ideas, often under development and mostly untested.

Further complicating the problem of innovation portfolio management is the fact that innovation proceeds best when it proceeds rapidly from failure to failure, for this is how the learning process advances best; fail faster to succeed faster, we might say.

These failures occur as part of the journey from strategy to sales, the innovation process that translates organizational imperatives into added value in the market. Portfolio management is the second stage in this broader innovation process, an early-stage element of this strategically-managed sequence of activities.
The 9 Stages of the Ideal Innovation Process

While the process as shown appears to be linear, in practice there are countless opportunities for learning and feedback throughout. In fact, the entire process is thoroughly iterative and loops over and over on itself, as learning achieved in any stage may influence all the other steps as well.

For a more detailed description of the Innovation Process please see the companion white paper, Innovation Metrics.

This certainly makes sense, in that we identify our goals first, and then manage the process to achieve them. At the early stages of the development of an idea, its future value is almost entirely a matter of speculation. As work is done to refine it, and so to create business value, a lot of learning goes into making the myriad decisions that are inevitably necessary. The innovation process as a whole therefore seeks to optimize the learning, and to capture and apply what has been learned for the benefit of the organization. This will enhance the value of the portfolio as it increases the value of each and every idea within the portfolio (and you can’t say that about stocks and bonds!).

Hence, the process of creating and managing innovation portfolios occurs in parallel with the process of innovation development.
Innovation Portfolio Management

The process of preparing and managing Innovation Portfolios consists of these 5 steps:

Step 1: Model the Key Strategic Factors in the industry
Step 2: Define the characteristics or criteria to be considered.
Step 3: Define the weighting of the characteristics and score for attractiveness.
Step 4: Risk-Reward assessment and the ideal Innovation Portfolio.
Step 5: Assess proposed new projects.

This process enables you to consider a wide range of important issues related to each potential innovation investment, and to do so in a reasonable sequence.

Step 1: Model the Key Strategic Factors in Your Industry

In every well-managed organization there is an intimate link between strategy and innovation. The possibilities of strategy are informed by the possibilities of innovation, and innovation should be directed toward strategic targets. So the innovation management process begins by taking into account the key strategic issues that your organization faces.

These key factors could include:

1. The innovation strength of your competitors. When competitors are strong innovators, we may have to increase our own capability to match their capacity.
2. Specific initiatives our competitors are undertaking now. If they have announced their plans or projects then this may influence our choices.
3. Our position in the industry (leader / follower / etc.). If we are a leader and intend to maintain our position, then we must be prepared to back up our position with investment.
4. Our appetite for risk, one aspect of which may be the strength of our balance sheet. If our organization is entirely risk averse then it will affect the types of projects we are willing to undertake.
5. The rate of commoditization in our industry. At what rate are prices declining, and how innovative do we have to be to maintain profitability in the face of price drops.
6. How fast digital technology will sweep over our industry. If digital technology is or will have a significant impact on us, then we’ll have to invest to prepare.
7. The impact of globalization, the threats it brings with it, and the new markets it enables.
8. The overall rate of change in your industry. When change is very fast it requires an approach to innovation that is built around speed to market.
This is an illustrative list only, as there are other factors that may be more pertinent to your organization. The point is that innovation leaders need to prepare a complete list, and then choose a set of 5 - 10 that they feel are most important to focus on.

And then later on, when you conduct a periodic review of your innovation portfolio, refer back to these factors to verify that they are still valid, and still the most important overall strategic criteria to consider.

These key factors will also become the basis for Step 2.

**Step 2: Define the characteristics or criteria to be considered.**

The criteria that you will use to evaluate individual ideas and projects will depend on the strategic factors of the specific industries and markets that you compete in. Develop a list of the evaluation criteria that are important for you.

The following criteria *could* belong on your list, and there may be others as well:

1. Fit with strategic factors listed in Step 1
2. Uniqueness
3. Probability of technical success
4. Probability of commercial success
5. R&D cost to completion or to next decision point
6. Time to completion or to next decision point
7. Intellectual property protection or ease for competitors to copy
8. Durability of competitive advantage
9. Innovation platform*

*An innovation platform is a basis on which other innovations can be developed, and may therefore be more desirable than a stand-alone innovation. For example, the core iPod technology concept is the basis of many different iPod devices. Another example is the Starbucks retail chain, which sells a wide variety of coffee products and other related and unrelated goods.

Your list may have anywhere from 5 to 15 criteria.
Step 3: Define the weighting of the characteristics and score for attractiveness.

Basic risk and reward are important assessments, and there are other characteristics that you will want to consider as well. Some of these will be more important in your evaluation than others. Hence, the table shown on the next page enables you to consider all the criteria you consider important, and to give extra weight to the characteristics on which you place greater importance without neglecting the aspects that matter less.

Each idea or project under consideration would be evaluated on the same weighting table so that score for each could be meaningfully compared with the others.

When you review the portfolio on a periodic basis, such as quarterly, you can reexamine the rating for every project to see if its importance has changed due to changes in the external environment, or perhaps due to whatever has been learned in the innovation process itself since the last evaluation.

This way, projects that may suddenly gain or lose perceived value can be managed accordingly by adding or removing resources to accelerate results or even stopping the work entirely.

<table>
<thead>
<tr>
<th>Innovation Portfolio Evaluation</th>
<th>Idea or Project Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategic Factors</strong> (for example)</td>
<td>Weight (1 - 5)</td>
</tr>
<tr>
<td>1. Rate of change</td>
<td></td>
</tr>
<tr>
<td>2. Innovation strength of our competitors</td>
<td></td>
</tr>
<tr>
<td>3. Specific initiatives our competitors</td>
<td></td>
</tr>
<tr>
<td>4. Our position in the industry</td>
<td></td>
</tr>
<tr>
<td>5. Our appetite for risk</td>
<td></td>
</tr>
<tr>
<td>6. Impact of digital technology</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
</tbody>
</table>
### Table 1

**Strategic Factors and Innovation Criteria**

<table>
<thead>
<tr>
<th>Innovation Criteria (for example)</th>
<th>Weight (1 - 5)</th>
<th>Rating (1 - 5)</th>
<th>Score (Weight x Rating)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Uniqueness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Probability of technical success (technical risk)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Probability of commercial success (commercial risk)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4. R&amp;D cost to completion or to next decision point</td>
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<td>5. Time to completion or to next decision point</td>
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<tr>
<td>6. Intellectual property protection or ease for competitors to copy</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>7. Durability of competitive advantage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Innovation platform (vs. stand-alone)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
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</tbody>
</table>

### Step 4: Risk-Reward Assessment and the Ideal Innovation Portfolio

There are two different perspectives through which to examine your ideal portfolio. The first concerns the balance between risk and reward, while the second concerns the balance between the four types of innovation.

#### The Risk-Reward Matrix

A 2x2 matrix provides a simple and effective framework for thinking about the balance between risk and reward. The model is self-evident - the lower-right quadrant is a dangerous place to hang out, the upper left is ideal.
On an ideal basis, how would you distribute your investment? Some projects, strategic goals, or initiatives that are mandatory may not fall in the upper left quadrant, and they may even be in the lower right. How can you mitigate those risks?

Now that you know what your goal is, you have established the necessary context to evaluate the projects that you’re already working on.

First, use a matrix like the one above to assess each project that’s in the current portfolio. This will of course be subjective, but that’s appropriate at this stage, since there are probably many unknowns. The point here is to hone your judgment over time, while engaging in a constructive conversation with others about what...
constitutes suitable reward and acceptable risk, and where individual projects fall on the matrix. The dialog is as important as the scores, because through dialog you may uncover new opportunities, even as you also explore how to mitigate risks and overcome problems.

Figure 4
A Weighted Risk-Reward Matrix Showing Individual Projects

The next step is to identify the quantity of funds that are currently committed or being invested in each quadrant. Make a circle to represent each project in the portfolio, and position it in the relevant quadrant. This will show you the distribution of risk-reward across the entire portfolio, by project. Also, show the amount of investment in each quadrant by summing the individual projects and sizing the square accordingly. This will enable you to see at a glance how your portfolio is distributed, both by number of projects per quadrant and relative investment per quadrant.

The Four Types of Innovation

The next step is to consider the balance of investment across the four different types of innovation - breakthrough innovation, incremental innovation, business model innovation, and new venture innovation.
Step 5: Assess proposed new projects

Now you’re ready to prepare evaluations of all proposed new investments. The description here assumes that this will be done in a collaborative setting, involving a group of people who ideally represent many different elements of the organization, and who therefore can provide input from many different points of view.

The actual decisions about going forward or not going forward may reside with individual managers or small teams, but the input of a larger group should help to make the best possible decisions.

An Innovation Champion could play the role as facilitator for this process. The role of the facilitator is not to comment on the merit of the ideas, but rather to help guide the process so that it is efficient for all participants, fair for all, and optimally productive for the organization. (This is a key role for an innovation champion.) The facilitator should introduce everyone to the process you will use, and present the ground rules.

For each idea under consideration, the idea manager or idea owner should present an overview of the elements of the idea using the already-completed data sheet describing the project, along with Table 1.

This person should already be aware of the organization’s larger portfolio framework, and they should express their opinion about which type of innovation best describes the idea, and the risk/reward quadrant it inhabits. They should be prepared to describe how fast it might be able go through the funnel, from its current state all the way through to completion and sales.
The participants then discuss all the accumulated information and decide if they agree with the ratings.

1. Does the group agree with the placement on portfolio?
2. What about the placement on the funnel?
3. Does the group agree with the owner’s assessment of risk?
4. How does the project contribute to the Ideal overall Risk/Reward matrix? Is it an important contribution? Or is it too risky? Too slow? Not enough return?

For each proposed idea, participants should contribute their creative ideas for modifications to the ideas, further research, etc.

Other factors to consider may include:

1. The timelines of the projects - will they deliver value at the right time in terms of market demand and the pace of competitive innovation?
2. Risk: Do we have the right balance of risk?
3. People: Are the right people running or contributing to the projects?

It’s not necessary for the group to reach consensus on all of these points, as healthy disagreement about the future value of an idea is normal and natural. If, on the other hand, they all agree that it’s a poor risk, then stopping the project now may be the best choice.

All investments that are being considered should then be mapped on the risk-reward matrix, and the figures recalculated to indicate the new balance if the project were to go forward.

Ideas that get funding support could become the topic of a workshop, possibly led by an Innovation Champion, to accelerate the preparation of business plans, customer research, tacit knowledge research, etc.

A periodic review such as this should take place regularly, for updates and evaluation concerning ongoing ideas, and for evaluation and consideration of new ideas as well.

Portfolio Valuation

So, now you have a portfolio of different types of innovations, at different stages of development, from raw ideas through to nearly finished new products and services. Now we must address the issue of portfolio valuation, for like all types of investment, the value of this portfolio has to be measured so we know how we’re doing as investors. Given the inherent uncertainties in innovation some may consider this to be an art, or perhaps even black art, but in either case it’s a necessary one.

Valuation of the innovation portfolio should increase significantly year over year as the organization gets better at the innovation process, but choosing the right metrics, of course, is the key. Hence, the development of your innovation portfolio should be consistent with the design and implementation of a comprehensive approach to innovation metrics.
As noted, for additional thoughts on metrics, please see the companion white paper, “Innovation Metrics: The Innovation Process and How to Measure It,” downloadable at http://www.innovationlabs.com/publications/innovation-metrics/. In this white paper you’ll find a detailed discussion of both qualitative and quantitative metrics that can be applied to each of the nine stages of the innovation process.

Among the possibilities discussed are financial valuation approaches that relevant for later stage projects, including NPV, asset valuation, and/or option value of work in progress. Incremental innovation metrics might include tracking the percent of products/services revenue attributable to innovation within existing product/services lines.

It’s also a good idea to track the number and percentage of ideas and projects that are non-incremental and outside of the company’s traditional markets, which both communicates the importance of creating options to address uncertain futures, and address the need for such options to exist.

Conclusion

In conclusion, let’s consider the opposite approach. Let’s say you invest in innovation, or even that you invest a lot. But you don’t track the investment systematically, and you only manage the investments individually and not in aggregate. Where are you then? You are, to put it bluntly, relying on luck, when you could rely instead on sound practice. It’s not a very appealing option.

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