a special excerpt exclusive to InnovationManagement.se

the innovation master plan

the CEO's guide to innovation

by langdon morris

this excerpt includes

chapter 4

Langdon Morris is recognized worldwide as one of the leading authors and consultants in the innovation field. A new chapter of his latest book, *The Innovation Master Plan*, will be presented exclusively at InnovationManagement.se every two weeks throughout the summer.
It will soon also be available at Amazon.com (but not quite yet).

The Innovation Master Plan

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chapter 4

taking action:

the ideal innovation portfolio

"There is money to invest. But practically no innovation."[1]

Russian President Dmitry Medvedev

To design the ideal innovation portfolio we begin with the work you did in Chapter One to define your future goals, vision and strategic intent, as we see that the purpose of the portfolio is to pursue them systematically despite the uncertain world, and to overcome the problem that President Medvedev laments, which is to find the right balance between investment risk and innovation output.

So now let's put the principles and concepts we've been discussing into action. We've defined a simple process for portfolio management consisting of only 127 steps, which will enable you to do this.

Oh, no, that's not right. Happily, there are only 8 steps…

Step 1: Determine the *Burn Down* rate of your existing revenue and profit streams
Step 2: Determine the *Growth Goals* for revenue, profit, and ROI for your portfolio
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Step 8: Assess proposed *New Projects* and choose your investments.

Once you've chosen which projects to invest in, you'll manage them, continuing to learn as you develop new products and services that become the innovations. The details of that process are the subject of Chapter 5, the innovation process, but it's important to note that you've already begun working on it through the act of designing your portfolio.

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1 Medvedev made this comment at a government meeting on modernization on January 31, 2011. A broader description of the innovation shortfall in Russia is reported in the article, "Dreams of an iPad Economy for Russia," by Lyubov Pronina, *Bloomberg BusinessWeek*, February 3, 2011.

linear processes and non-linear thinking

The sequential nature of time serves us by preventing everything from happening all at once, but it also presents a danger when we're engaged in complex activities that involve learning.

The danger exposes the conceptual flaw in the process that I'll describe below, because if we understand that the process has to be a rigidly linear series of steps that must be followed in one and only one sequence, then we won't succeed.

Since the pursuit of innovation is a learning process, then it would be ludicrous to follow any set of steps slavishly and only in the same sequence each time. Instead, it's entirely plausible that you will learn something in step 5, say, that would affect how you would prefer to approach steps 1 or 2. This would naturally cause you to go back and revisit those earlier steps, and voila, the linearity is suitably disrupted.

(As a small but pertinent aside, how many times have you been in a meeting when an interesting idea came up in the conversation but it was decisively killed when someone said, "Well, yes, but we won't be able to deal with that until the next budget cycle, you know…." The "budget cycle" argument delivers the *coup de grace*, stifling even promising and perhaps important ideas / innovations from getting any attention now. This is not an intelligent approach, although it is common, because slavishly following a linear thinking process can decrease responsiveness and increase organizational risk.)

Writing and reading are also linear activities, as the words on the page or the screen are obliged to follow one after the other in sequence. But in your brain the words and concepts are anything but linear. The human mind is so powerful precisely because it works by association, as one idea or experience reminds you of another, and it is precisely these connections that lead to insights, which in turn lead to innovations; learning and problem-solving by association has been the engine by which civilization progresses.

Examples of this brilliant power of the mind are all around us, and a few examples may help to remind us of the importance of associative thinking.

On the way to discovering penicillin, Louis Pasteur was investigating the nature of antibodies and recognized a potential solution in a moldy petri dish, which many others had not recognized. He is rightly famous for his comment that "luck favors the prepared mind," as indeed it does; "preparation" is a process of pre-populating the associative links, without knowing which potential links may eventually lead to useful connections.

Let's take a practical glance at this – have you ever been in a brainstorming session that went flat? Chances are that happened because the set of possible solutions you were working with wasn't broad enough, that you hadn't pre-populated your thinking process with a diverse enough set of concepts and models to draw from. Good brainstorming requires good raw material, and you can't do it well with the same old ideas you've already heard a thousand times. Brainstorming does work when you see the problem or the solution set differently.

Archimedes, he who supposedly ran through town naked while shouting "Eureka!" when he saw the problem differently, was also inspired by associative learning, in his case concerning the nature of water displacement. While the specifics

vary from story to story, the broader pattern is remarkably consistent: someone is working on a question or problem, and the solution is elusive. An unexpected event then occurs, which provides the previously-missing new information, and which illuminates the problem in a new way, and the solution is suddenly there in a flash.

Computers do not do this; only people do. And we do it all the time.

Steven Johnson explores this difference between computers and people in his book, *Emergence*. "The human mind is poorly equipped to deal with problems that need to be solved serially – one calculation after another – given that neurons require a 'reset time' of about 5 milliseconds, meaning that neurons are capable of only two hundred calculations per second. (A modern PC can do millions of calculations per second.) But unlike most computers, the brain is a massively parallel system, with 100 billion neurons working away at the same time. That parallelism allows the barin to perform amazing feats of pattern recognition such as remembering faces or creating metaphors."[2]

Johnson goes on to quote Ray Kurzweil's book, *The Age of Spiritual Machines*[3]: "Because each individual neuron is so slow, 'we don't have time … to think too many new thoughts when we are pressed to make a decision. The human brain relies on precomputing its analyses and storing them for future reference. We then use our pattern-recognition capability to recognize a situation as compatible to one we have thought about and then draw upon our previously considered conclusions.'"

The act of pre-populating the mind with a large scope of relevant information and patterns is a powerful enabler of innovative results when we marshall that power in the search for new patterns.

So if we're going to do a credible job of managing innovation, then we have to enable and empower the mind's unstoppable associative capacities to reach their full flower, and not enslave its magnificence as though it were a dull, repetitive machine that can only do things in a rote fashion. Feed the mind richly to get richly innovative rewards.

In light of this I would also therefore simply like to remind you as you read the following passages, that it would be a mistake to follow a process like this, even one that's labeled step 1, step 2, etc., without paying attention to the nonlinear nature of genuine learning. Oh, and that reminds me – Chapter 5 also expresses a sequence of steps for the innovation process; please don't follow that one slavishly, either.

step 1: determine the burn-down rate of your existing revenue and profit streams

A few pages ago we discussed the burn-down rate; it's the first thing you need to assess as you design your portfolio, because it tells you what the innovation portfolios need to achieve in terms of financial contribution to your firm's growth.

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2 Steven Johnson. *Emergence: The Connected Lives of Ants, Brains, Cities, and Software*. Touchstone, 2001. P. 127.

3 Ray Kurzweil. *The Age of Spiritual Machines: When Computers Exceed Human Intelligence*. Penguin Books, 1999.

So how fast is the market changing?

Will the rate of change in the market tell you how fast your products and services are becoming obsolete?

Can you draw a reasoned graph that shows the consequences of obsolescence, in the form of declining future revenues and profits?

Even if you can only guess, you still have to take a stab at it. We'll examine the specific nature of the changes in step 3 of the process, and learn from them what sorts of innovations might make sense to pursue. The purpose here is simply to give a specific form to your knowledge that things are changing and you'd better be preparing new sources of revenues and profits.

step 2: determine the growth goals of revenue, profit, and ROI for your portfolio

Knowing the rate of obsolescence will then tell you with at least moderate confidence how much new revenue and profit you'll have to create in the future simply to stay even with where you are now.

But of course it's not enough to stay even. Investors expect growth, and any company that doesn't deliver growth will be penalized. So your innovation efforts will have to not only replace the eroding revenues of existing products and services to prevent the pie from shrinking, but will also have to provide new revenue sources to grow the overall size of the pie as well.

So here in step 2, calculate the revenue and profit targets that your innovation portfolio should be designed to achieve.

You also need to know your cost of capital, and there is most likely a benchmark minimum ROI that all of your organization's investments are expected to achieve.

subjectivity

By now you understand that the decisions you have to make at each step of the innovation process necessarily involve assessments of risk and varying likelihood of success across a huge range of variables. There may be few facts to rely on, but a myriad of opinions and speculations, which is to say, a lot of guesswork. Hence, most of these decisions and factors are based on subjective judgments.

Consequently, the assessments and decisions that you'll make offer structure and guidance to your thinking process, and they must be made explicit so that they can be tested as you move forward through the process. Without explicitness, your process will lack rigor, and consequently it will be impossible to improve systematically.

step 3: model the key strategic factors in your industry.

Now it's time to look at the external landscape of competition and change. You've already read Chapter 1 and thought about the intimate link between strategy

and innovation. This linkage is a two way street, as the possibilities of strategy will be informed by the possibilities of innovation, and likewise innovation efforts will naturally be directed toward targets you've already identified as strategic.

You also thought carefully about the action steps suggested there, so you've already grappled with the strategic factors, and you should have a clear picture of how the landscape is evolving.

In case you haven't already thought this through, I'll recap a few highlights here.

To manage the innovation process you'll have to understand the factors that are driving change in your industry, and assess how they're likely to impact your organization in the future. This will help you to get a better look at both your vulnerabilities and your opportunities.

Is technology driving your industry forward? If your core products use computer chips, then the progressive improvement of chip performance creates strategic opportunities and risks for your firm. (Potato chips, however, are different.)

Or perhaps it's demographic factors, such as the aging of the population, that are central concerns. In Chapter 2 I mentioned that in Japan the overall population is forecast to decline from about 130 million to about half that, 65 million, by the end of this century. This will have a decisive impact on every Japanese company, and on every company doing business in Japan. (Does that leave many companies out?)

Do natural resources play a key role in your company's economic life? If you're in energy, mining, food, or chemicals, then resource cost and availability are at the center of your thinking.

Is yours a service business? Then do you know where you're going to recruit future generations of employees? And do you know how much training they'll need, and where they're going to get that training from?

Each industry, and within it each type of company, has it's own issues, and you've doubtless already spent a great deal of time thinking about this. (You're certain to spend a great deal more as time goes on.) Your goal has been to develop a strategic perspective, a viewpoint that explains what's happening, and why.

You're not necessarily going to be right about it, and although it's probably more fun to be right, the point isn't so much about right and wrong as it is about improving your sensitivity to change, and being prepared to take action because you've already thought things through.

Then, when things do change (which they will), and one of your key assumptions is perhaps invalidated by subsequent events, you can say, "Cool! We didn't expect that! Now, what does it mean, and how do we have to adjust our thinking?"

Too often, however, the key strategic assumptions remain hidden, and the consequences when they are overturned are therefore disastrous. So, by example, going back to the banking collapse, the two key hidden assumptions underneath the whole mess were that the mortgage market was permanently stable, and that the self-interest of the banking institutions constituted a valid mechanism for self-regulation. What actually happened was that the motive to earn amazing profits drove the underlying market away from sound practices and therefore towards instability, and the same lust for profits drove the banks beyond the limits of prudence and they put themselves at risk. Or, to put it bluntly, Greenspan's assumptions blew up in his face, and in everyone's face. Don't let that happen to you!

You also need to factor in your position in the industry. Cisco, as a leader in networking hardware, has different strategic options and strategic challenges than Juniper Networks or Alcatel, which in the current market configuration are chasing Cisco. Likewise, GM's options are different than Toyota's, and Southwest Airlines faces a different world than United, Air France, or Emirates.

Later on, when you've been running your innovation portfolio process for some time you'll naturally undertake periodic reviews, and you should revisit these factors to verify that your assumptions about them are still valid, and that they are the pertinent strategic criteria to consider.

List the 5 – 10 strategic factors that are essential to your business model; they will become the basis for Step 4.

step 4: set the overall strategic direction

A key factor that will influence your portfolio design is the realization that at any given time in any given market only a few critical value drivers are most important to customers, and your company may or may not be in position to deliver on those preferences. Whichever company happens to have the right mix typically gains a temporary advantage, with the emphasis on "temporary" since both technology and the market's needs often change, and usually without much warning.

But it's not just the preferences of customers that matter. The capital you have available will significantly affect your ambitions, and so will your intellectual property, the customer base you're currently supporting, and the capabilities of your team.

Despite all of these variables, though, there are really just three choices concerning your overall innovation strategy (although in practice they will naturally support many variations).

Option #1 is to lead.
Leaders create new products and services in advance of the competition, usually by anticipating the needs of customers, and thereby gain competitive advantage.

Option #2 is to follow.
Followers wait for other firms to set the pace and then they cleverly copy them. Lest your instinct is to think less of the followers, please note that many of the most admired firms in history have been successful followers, and it's a valid approach in many situations.

Option #3 is to choose a niche and defend it vigorously
The firms that have limited innovation resources usually have to choose a portion of the market where they can carefully cultivate a customer base and build some protection around their offer. They may take advantage of specialized or local knowledge, or enhanced levels of service, or an offer that is so specifically targeted that customers are happy to remain loyal.

leaders

Some companies are so proficient at innovation that they take the lead in a market and remain there for extended periods of time; they lead the race wire to wire. Usually they succeed at this because they have effectively anticipated customer needs.

We have already discussed the enviable characteristics of many leaders, including Cisco and Wal-Mart, but almost all of them also faltered at some point in time, a list that includes Coca Cola, IBM, Blockbuster, Nokia, Sears, and Boeing.

Maintaining leadership over an extended period takes a great deal of luck, or skill, or both, to create a defensible competitive advantage that endures. It requires exceptional discipline and a very strong innovation culture to adapt over extended periods, and while it can be done, and it's certainly worth aspiring to, the challenges should not be underestimated.

And as I have noted, the number one challenge is mindset.

followers

It's so tough to stay in front that many companies prefer to direct their innovation efforts in response to what competitors are doing. The difficulty of maintaining market leadership is usually high, and as time passes leaders see all sorts of challengers emerging from the dark, surrounding forests to lay claim to this or that part of their markets. Followers wait, and watch, and when something good emerges they copy it, hoping to leap past the originator, the approach that Peter Drucker labeled "fast-follower."

Spanish retailer Zara perfected the fast follower approach in the clothing industry by setting up a manufacturing and distribution system capable of producing the latest fashions very quickly, enabling Zara designers to copy high fashion styles and distribute the knock-offs to its stores worldwide within weeks.

In rapidly-changing technology markets, the evolution of the smart phone market shows the vulnerability of a leader's position pretty clearly. After its introduction in 2007 Apple iPhone was definitely the world-leading smart phone, but Android entered the market a year later, in 2008. By the 3rd quarter of 2010, Android sales made up 25% of the total smart phone market, while the iPhone's were 17%.[4] While the Android phone's design owes a great deal to the iPhone, as the look and feel of the device is clearly a copy of the approach that Apple pioneered so effectively, Android's business model is proving to be as effective or more effective than Apple's.

Hence, while a current leader enjoys the front running position in an existing market structure, innovations and copies may emerge that signify changes to the market structure; would-be leaders are vigorously searching for these opportunities, and when they find one it often provokes a major change, a structural change in the market.

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4 Dawn Kawamoto. "Android Gains Mobile Phone Market Share as Apple and All Others Lose," Posted 11/10/10; http://www.dailyfinance.com/story/company-news/android-gains-mobile-phone-market-share-as-apple-and-all-others/19710980/.

The transition between two structures is frequently the occasion when an established leader is displaced by a new competitor.

The emergence of the iPhone and its predecessor the iPod are both examples of structural change. The iPhone significantly altered the overall cell phone market, and so did the iPod. But shouldn't it have been Sony that dominated the MP3 player market? The company had decades of experience in making brilliantly conceived and designed miniature music devices, having produced millions of tiny radios and Walkmans, practically inventing the category, and leading it wire to wire. And Sony owned BMG music, one the largest music publishing houses in the world. All it would have taken is for the company to put A and B together for Sony to dominate the MP3 era.

But Sony didn't do it; Apple did, creating the iPod and iTunes, which remain the leaders today, having so far turned back challenges from Sony, Dell, and Microsoft, among others.

It is worth noting that you could also say that Apple followed, copied, and outperformed Sony; how you frame it may just depend on your time horizon, and your knowledge of history.

The benefits of following are also evident in the story of Netscape and Microsoft. Do you even remember pioneering Netscape, which introduced the Navigator browser and rocketed to prominence in 1994? So many millions of people downloaded early versions of Netscape every month that the company was able to go public just 9 months after introducing its signature product.

Why did people choose Netscape? Simply because it worked better. This gave the company a brilliant head start in the browser market, which of course came to the attention of Bill Gates at Microsoft. Realizing what was happening, Gates quickly organized a crash program to create Internet Explorer, which quickly caught and then passed Netscape. Many observers have alleged that Microsoft used illegal business tactics to manipulate the market by forcing PC manufacturers to bundle Explorer with their machines while excluding Navigator, and there was a great deal of courtroom activity on this dispute. Nevertheless, by 1998 Netscape had lost its leadership position and had to seek refuge as a subsidiary of AOL.

AOL itself had pioneered the internet as a mass market medium, but was soon overtaken when free email services were introduced by clever start up companies that were immediately gobbled up by Yahoo, Microsoft, and Google. They displaced AOL's pay-for-access subscription business model, rendering it obsolete.

Meanwhile, Google's search algorithm was introduced in 1998, grew rapidly, and the company went public in 2004 and continued to grow quickly thereafter. The explosive success of Google's search engine made AOL's closed world and clunky interface obsolete, which rendered AOL's Netscape acquisition irrelevant; Netscape was eventually disbanded in 2003 ending a tumultuous ten year run, having been caught and passed by its competitors not once, but twice. (It continues to live on, however, in the Mozilla browser, which is embedded in Firefox.)

In 2008, with the internet world still evolving very rapidly, Yahoo spurned a merger offer from Microsoft based on its belief that it would do better on its own. But it proved to be a poor choice, as the company fell into decline while Google's search algorithm continued to produce better results than Yahoo, and Google's

business model attracted more users.

With Google continuing to grow, Microsoft turned its attention to the search engine, and introduced Bing in 2009 in an attempt to take market share away from Google. After the first year, however, Bing remained stuck at 3% of the global market, while Google maintained 85%.

These are particularly fast moving markets in which it's rare for any company to sustain leadership indefinitely. So will another company be able to replace Google in the leadership position? As we see that innovations come in waves, leading to changes in the beliefs and attitudes of customers, and which in turn alter how they feel about various competing offers, it's entirely possible that one day Google will be pushed aside. Will it be Facebook? Twitter? Or a company that doesn't even exist today?

It's fascinating to see these changes occurring when you're on the outside, but often frightening from inside; no matter how enormous your competitive advantage is today, it may erode to nothingness tomorrow. Who's out there lurking, waiting to leap past your company?

own your niche

Not many companies have the resources to invest in innovation on the scale of Google, or Microsoft, or Cisco. But they do know that innovation is critically important to their success, and to their survival, so they invest in innovation selectively.

This is the third approach to innovation strategy, picking a spot where innovation can improve your business and focusing your innovation efforts there. This strategy is available to every company, no matter how small, and no matter what the industry.

For example, can you innovate in hair cutting? I wasn't sure, until I realized that the national discount chains are indeed a business model innovation targeting people who want it done inexpensively. And recently I read that the founders of a hair salon in LA noticed that customers had basically two options, high end salons or discount chains. So they opened a service in the middle that was successful from the start by targeting the needs of their customers very precisely.[5]

Can you innovate in hotels? Of course. Hotel companies are innovating all the time to attract customers with just the right combination of comfort and style amenities, and frequent guest programs to create loyalty. Have you ever chosen a hotel for the loyalty points towards a free room (or an airline for the frequent flyer miles)? I admit, I do it all the time.

Can you innovate in food? This also happens all the time. The typical supermarket carries about 50,000 products, but the food industry produces 15,000 additional new ones each year. It's shotgun innovation and trial by fire to see which products survive, from incremental additions to existing lines (a new flavor of Fritos) to entirely new product concepts, to entirely new retail chains like Whole Foods,

5 *Entrepreneur* Magazine, Oct 10, 2010, p 20.

which is also defining its own niche by focusing on health foods and rolling up local stores and regional chains to aggregate economy of scale.

How about house cleaning? I didn't realize that anyone could innovate in house cleaning as a one-person business, because after all a clean house is a clean house. But then I learned about my friend's quite innovative maid, who brings fresh flowers each week when she cleans the house, and also cooks up some fresh bread or cookies while she's there, leaving her customers' houses smelling fresh. My friend says she'd give up Starbucks (OMG!)[6] before she'd give up her thoughtful and innovative maid.

These few examples are intended to show that innovation can indeed happen in every industry, and if you look carefully you'll see it occurring throughout your industry, too. But it's not happening in every company, and the stragglers are likely to fall farther behind.

the dreary stragglers

There are other approaches to innovation, but neither of them are appealing.

Some companies try half-heartedly but never succeed at developing innovations ahead of their competitors. Even their copies are uninteresting, and while they may have strong technical skills, they lack fire, or insight, or innovative instincts. Or perhaps they have a business model which casts them as contented followers rather than fast followers. These companies tend to become marginalized, and fade away as change accelerates.

And the last group consists of those that fail at innovation because they fail to try. They lack nerve, or talent, or awareness, and probably capital as well. These companies are not good bets for survival.

There's not much more to say about these two approaches, and so unless they get inspired to pursue innovation and make huge leaps in their skills they'll remain uninteresting from an innovation perspective, and vulnerable from a strategic one. They'll be permanent followers, and many of them will be early casualties of change.

Companies and industries are too complex to merely select a single strategy to apply across the board. Inevitably you choose specific strategies for specific markets; in some you lead, in others you follow, and in others still you pick your spots or stay out of the innovation race entirely.

So the point of this discussion in terms of your innovation portfolio is to choose thoughtfully and explicitly. What, you should ask, does it take to be a leader in this industry? Do we have the capability to achieve that? Or are we better following, and copying? Or defending a specific niche?

6 "OMG" is texting language used among young people that stands for "Oh my God!" In other words, a big surprise.

step 5: define the characteristics or criteria according to which new ideas will be evaluated

Once you have a perspective on how things are changing and which strategy you intend to follow, then you can decide what factors to emphasize in designing your overall innovation portfolio and selecting individual projects.

We usually group these factors into two categories, external strategic drivers, and internal innovation criteria. The two lists identify the criteria according to which you will evaluate the merits of individual ideas, as shown on the form a couple pages below.

By establishing the criteria in advance, you'll avoid the danger that a given idea is the pet project of a senior leader and gets supports beyond its inherent merits. Instead, all proposed projects will be evaluated (or re-evaluated, if this is a review session looking at an existing portfolio) according the same set of criteria, and the scores that they receive can be legitimately compared to each other.

external strategic factors

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

As an example, these six, derived from the discussion in Chapter 2 concerning driving forces of change, may (or may not) be relevant to your business:

1. Leverages Commoditization
2. Leverages Digitization
3. Leverages Social Mediziation
4. Leverages Globalization
5. Insulates us from Turbulence
6. Insulates us from Acceleration.

Remember your list could be different; should be different.

internal innovation criteria

Here the focus is on the characteristics of a given idea and the capacity of your organization to transform that idea into a compelling innovation opportunity.

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

1. Uniqueness of the idea
2. Probability of technical success
3. Probability of commercial success
4. R&D cost to completion or to next decision point
5. Time to completion or to next decision point
6. Intellectual property protection or ease for competitors to copy
7. Durability of competitive advantage

8. Durability as an innovation platform*
9. Leverages existing competences and capabilities.

* I haven't yet discussed the concept of the innovation platform. Briefly, it's a basis on which other innovations can be developed, and may therefore constitute more desirable investment than a stand-alone innovation. For example, the core iPod technology concept is used in many different iPod devices, as well as the iPhone and iPad, because elements of the hardware and software of iPod enable a wide variety of devices to function. Similarly, auto companies typically design a basic frame, engine, and chassis configuration upon which they can then build many different coupes, sedans, and convertibles. On the outside the cars look different; on the inside they have significant similarities, which saves a lot of money in development and in manufacturing. Platform thinking was popularized by Black and Decker's power tools division, which developed a standardized battery system for tools that enabled it to significantly reduce development costs for many derivative power tool products.[7]

Innovation Portfolio Evaluation Form

Innovation Portfolio Evaluation	Idea or Project Name:			
External Strategic Factors	Weight (1 - 5)	Rating (1 - 5)	Score (Weight x Rating)	
1. Leverages Commoditization				
2. Leverages Digitization				
3. Leverages Social Mediaization				
4. Leverages Globalization				
5. Insulates us from Turmoil				
6. Insulates us from Acceleration				
Total				

Internal Innovation Criteria	Weight (1 - 5)	Rating (1 - 5)	Score (Weight x Rating)
1. Uniqueness			
2. Probability of technical success (technical risk)			
3. Probability of commercial success (commercial risk)			
4. R&D cost to completion or to next decision point			
5. Time to completion or to next decision point			
6. Intellectual property protection or difficulty for competitors to copy			
7. Durability of competitive advantage			
8. Innovation platform (vs. stand-alone)			
9. Leverages existing competences and capabilities			
Total			

Table 1
External Strategic Factors and Internal Innovation Criteria
in the Innovation Portfolio

7 Marc Meyer and Al Lehnerd. *The Power of Product Platforms*. Free Press, 1997.

The criteria listed under External Strategic Factors and Internal Innovation Criteria are examples only. Yours will most likely be different. The external ones shown here are based on the topics covered in Chapter 2, The Driving Forces of Change. It's not necessarily the case that the highest scoring ideas are the best ones, nor that lowest scoring ideas are the worst, but the process of determining the scores should be informative in your discussion and decision making process.

Your lists may include anywhere from 10 to 20 criteria, but if it grows longer than about 15 then the comparison is likely to get progressively muddled.

In this step your focus is simply on determining the criteria, which you will put onto a form, like the one shown. In the following step 6 you'll determine the weight of each criterion according to importance, and then you'll have created a simple working form for portfolio assessment.

step 6: determine the weighting of each characteristic and score each idea

Some characteristics are critically important to your business, much more important than others, so weighting the various factors will put emphasis where it belongs.

Determining the right weight is likely to be a fairly simple discussion, and it may not be difficult to reach agreement. However, if there is a wide range of disagreement then this may indicate that people hold differing assumptions about the structure of the market. This is a marvelous discovery, because if there are differing assumptions then someone is probably wrong, and you have arrived at a key point of learning. When you figure out who's right, and which assumptions are therefore valid or invalid, you may be able to make significant improvement in your basic underlying strategy or strategic intent.

However, you may need to devise a specific experiment in order to figure that out.

Another reason the scoring tool is useful is that when you review the portfolio on a periodic basis, perhaps quarterly, if any factors in the external environment have changed significantly you can reexamine the affected projects to see if the changes alter your scores, and by implication if some projects should be elevated in importance, or reduced. Perhaps changes in the external environment make a given project less attractive, or more so, such that a project which was only nice-to-have is now suddenly indispensible. Or conversely, maybe a project that was a top priority imperative last year is suddenly irrelevant. Projects may gain or lose perceived value and can be managed accordingly by adding or removing resources to accelerate results or stop the work entirely; this is a good thing, because it means that a disciplined process is helping you to optimize the use of your resources.

So let's say that you're looking a portfolio of 25 projects, and everyone on your team has scored them, and the scores have been compiled so you know the average for each criterion, and you know the range. Further, everyone has chosen the two or three that they think are most important, and the ones they think aren't worth

pursuing at all. There's a pile of papers sitting on the table that contains all this information.

Figure 10
Evaluating an Innovation Portfolio

First, please, put the papers on the wall so you can see all 25 at once (as you see in figure 10), and group them according to a criterion such as highest scoring to lowest, or group all the ones that anyone has selected for the top 3 list or their bottom list. Chances are there will be some that fall into more than one category; put those separately, maybe in the middle.

Now it should be much easier to see the patterns, and it's therefore possible to have a reasonable and fruitful discussion.

- Are there more projects than you can fund?
- Are there fewer good projects than you want?
- Are you weighted too heavily towards particular markets, or towards particular types of innovations?

All of this should be visually evident, enabling you to focus on portfolio design and decision making rather than just on the details of particular projects and personal preferences.

So let's say you've gone through this process and you've agreed on the 3 best projects. The others aren't right for now, but they may become relevant in the future, so the information about them is indexed and archived somewhere readily accessible so you can get at it later if you need to.

In the mean time you've got three possible new projects, plus a lot already under way. Now you need to look at them all together as a portfolio, and assess the risk – reward profile of the portfolio as a whole to make sure your risks are not correlated, and that your projects are sufficiently diverse in targets and in approaches.

step 7: risk-reward assessment and your ideal innovation portfolio.

Your appetite for risk is a function of many factors, which might include:

- The rate of change
- Your competitive position
- The historical or competitive rate of investment in innovation in your industry
- The strength of your balance sheet
- The personal views and attitudes of senior managers concerning risk
- The current economic situation
- Your perception of the overall risks and opportunities that your organization has before it.

Your confidence in the ability of your firm's innovation process and innovation managers to produce the needed results is also going to be a significant factor. For example, a history of non-success may reflect extensive or prolonged incapacity, and will have already led to a bias towards acquisitions. Following processes as described here should begin to remedy the situation, and over time the results should improve and your confidence in it should increase. But that will not happen immediately.

As you integrate all these factors together in your thinking, an ideal portfolio will take shape, and it will be specific to your company and your industry.

There are two lenses to apply when planning a portfolio at this level of detail. The first is the balance between risk and reward, while the second concerns the balance between the four types of innovation.

the risk-reward matrix

A simple 2x2 matrix allows you to consider the balance between risk and reward, especially if you haven't already thought about the two together. The model is self-evident - the lower-right quadrant is the wrong place to invest, while the upper left is usually very attractive.

So what kind of risks are we talking about?

A given idea may not work out, which would involve cost to the organization in terms of lost investment of time and money.

Well, of course it might not work out, but often we've got to try to find out, and there's no guarantee that we'll get it right the first time.

That might lead to a second try, and then a third, etc., until we do get it right, and attain the eventual payoff. But it's also possible that any given idea leads to no specific payoff at all, that it's a dead end.

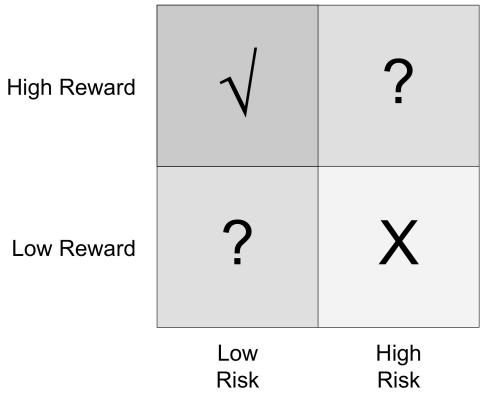

Figure 11
The Risk Reward Matrix[8]

(Note that for the moment we have probably set aside the benefit of the learning as a criterion (which we of course expect from every project) because now we're into assessing the financial and market perspectives. If we want to go ahead with a project because of what we will learn from it, absent the financial rewards, then that's fine, but we shouldn't weigh down our portfolio with those projects. Let's call them "pure research" and put them in a separate category.)

Ideally, 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?

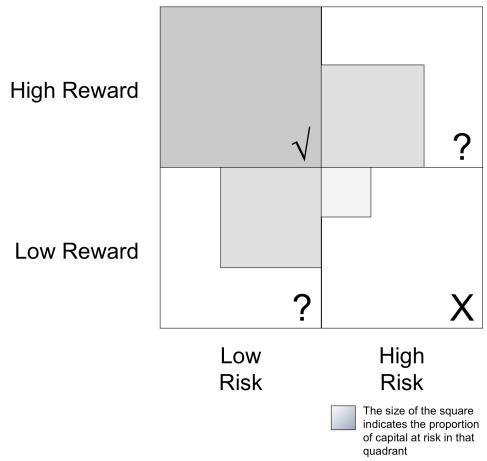

Figure 12
A Weighted Risk-Reward Matrix

Once upon a time we were working through the portfolio design process with a team of people who worked in a financial services company, and of course we

8 Some of the concepts presented in this section have been adapted from the book *Third Generation R&D* by Philip Roussel, Kamal Saad, and Tamara Erickson, 1991. Chapter 6 is particularly helpful.

introduced this matrix. Since they'd never used it before we tried it out with the ideas that they were already working on, the existing portfolio.

As we plotted the location of each idea, one after another, the warm light of awareness began to dawn around the room; the majority of the current projects fell into the least desirable quadrant, they were high risk and low reward.

Nervous laughter was followed by some chin rubbing. "Well," one of them said awkwardly, speaking for everyone, "That's interesting…."

Now that you know what you're aiming for, you have established the necessary context to evaluate the projects that you're already working on.

Use the matrix to assess each project that's in the current portfolio. This will of course be subjective, but that's inherent in this process. The point here is to hone your judgment and to engage in a constructive conversation about what constitutes suitable reward and acceptable risk, and where individual projects fall on the matrix relative to the others.

The next step is to identify the quantity of funds that are currently committed to or being invested in each project in each quadrant. You can represent each project as a circle, with the size of the circle corresponding to the amount of money that you're planning to commit, or the amount already spent, depending on the question you want to address.

This will show you the distribution of risk-reward across the entire portfolio, by project.

Lastly, you can now make a square in each quadrant to aggregate the individual projects, and size 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.

How does it look? Are you happy with the distribution, or is it out of balance?

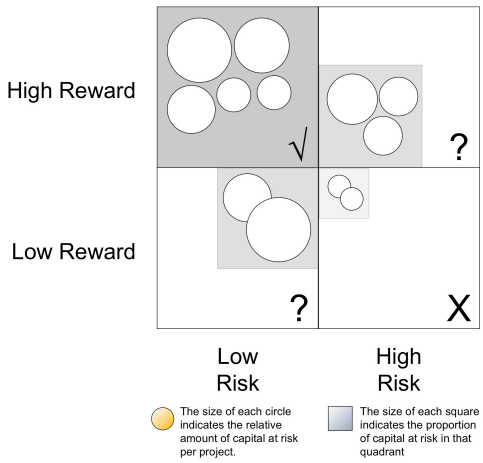

Figure 13
A Weighted Risk-Reward Matrix Showing Individual Projects
A circle represents each project in the portfolio, and the size of the circle corresponds to the relative capital investment it entails. The quadrant squares represent aggregate capital in that quadrant from all the projects.

four types of innovation means five portfolios

I've already mentioned the need for balance across the four different types of innovations, breakthrough, incremental, business model, and new venture innovation. You will go through the process above for each of the four types, and then again to aggregate them into the fifth, overall portfolio.

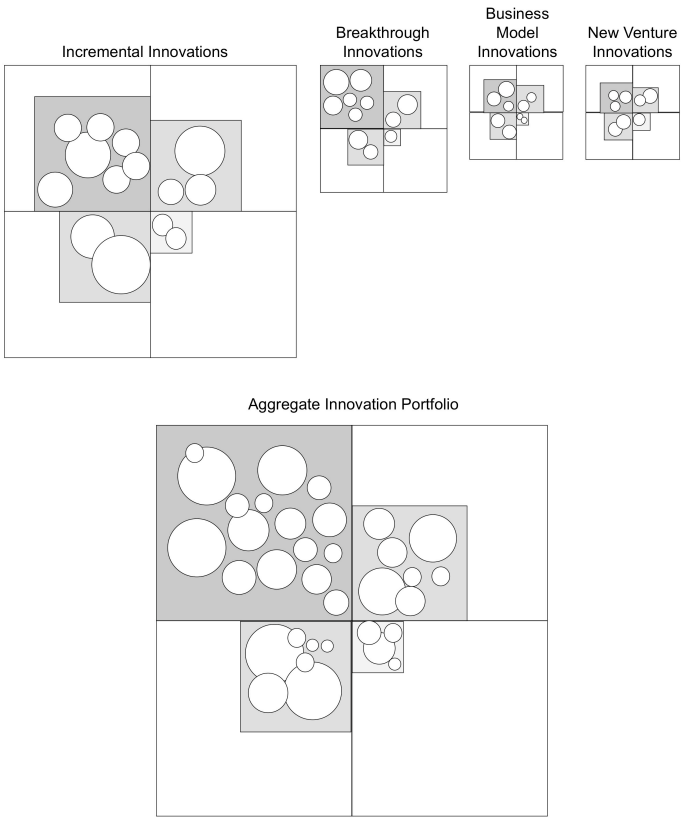

Figure 14
Five Innovation Portfolios

The majority of overall investment here is in Incremental innovations, and the balance distributed across the other three types. But what do the dynamics of your industry call for?

step 8: assess proposed new projects

Now all the diligent prep work you've done comes together. You're ready to make decisions on your existing and proposed projects in order to determine which are most attractive. You will document why you think so, so that as the work proceeds you can validate your assumptions and your decisions, or discover that it's time to reconsider based on what you have learned along the way.

The process I've described assumes that this will be done in a collaborative

setting, involving a group of people who represent many different areas of expertise from within your organization, and who therefore can share their thoughts and assessments from many different points of view.

It will be very helpful to have a facilitator involved in designing and running this session. Regardless of how much we remind ourselves that it's a learning process, we also know that opinions may be influenced by factors including ego needs, idea-fixation, career path ambitions, pet peeves and pet projects, and personal visions of the future, so a neutral facilitator's guidance can help the effort to remain focused on creating future value for the organization as a whole.

The facilitator is likely to be someone whom we would call an "Innovation Champion," a term that will be explained in detail in Chapter 7. 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's efficient for all participants, fair for everyone and each idea, and optimally productive for the organization. Facilitators also make sure that all the underlying information has been gathered – weightings agreed upon, assessments prepared, numbers aggregated and averaged, ranges calculated, and all those pieces of paper have been posted on the wall.

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

evaluating individual ideas

For each idea under consideration, the idea manager or idea owner should present an overview, the heart of the idea, to an evaluation team or innovation committee.

They can bring with them an already-completed data sheet describing the project, along with the information that I presented above as Table 1. However, sometimes the need to "fill out a form" is a barrier, and in that case you may choose to invite them to come and share their idea while team members or the facilitator document the salient points of their idea in the appropriate parts of the collection form.

The person or team that brings the idea should have been asked to think about the portfolio model, and should be prepared to state their opinions about where their project belongs concerning the type of innovation it is, and the quadrant on the risk/reward matrix where it resides. And they should be prepared to talk about how fast it can progress through the innovation funnel from idea (or wherever it is now) to completion. (The details of the funnel are presented below, in Chapter 5.)

The team should discuss the idea and the nature of the opportunity it represents. It's not necessary to reach consensus at this stage, as healthy disagreement about the future value of an idea is normal and natural.

- Does everyone agree about the risk-reward quadrant? If not, in what ways do they disagree?
- Can a small investment in experimentation resolve the disagreement?
- Does the group agree with the owner's assessment of risk? Can the scope of

risk be validated in some way?

- How does the project affect to the overall Risk/Reward matrix? Is it an important contribution? Or is it too risky? Too slow?
- Is the potential return nicely attractive? Or insufficient?

All investments that are seriously considered should be plotted on the risk-reward matrix, and the totals recalculated to show what the new balance would be if the project were to go forward.

For each proposed idea, participants may also have creative ideas for improvements, further research, etc.

Other factors to consider may include:

- Timelines: Will these projects deliver value at the right time in terms of market demand and the pace of competitive innovation?
- Risk: Do we have the right balance of risk?
- People: Are the right people running or contributing to these projects?

Significant ideas or even good ones that are in need of further development could become the topics for focused workshops, during which the implications and possibilities will be explored in greater detail. This will also help the ideators to prepare the next steps, which may include business plans, customer research, tacit knowledge research, etc.

At Shell Oil, the game changer process was developed to help people with "big ideas" to explore these possibilities and turn the best ones into business plans that are then considered for funding by an internal venture board. Engineers are coached through the process, which occurs in a series of highly structured two day workshops that take place over a period of a few months.[9]

By managing their portfolios over time using a process like this, a team of executives can significantly improve the portfolio's performance. And as they engage this type of thinking they get more in sync with the evolving market, and better at identifying and supporting the projects that have greatest potential, and certainly better at shaping the future of their enterprises.

the last word…

During 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 ideas in pursuit of business value, the key to success is learning, as the learning shapes the myriad design decisions that are inevitably needed.

The innovation process therefore seeks to optimize the learning that is achieved, and to capture what has been learned to improve the idea in focus, and for the benefit of the overall innovation process, as well as for the portfolio management process.

Innovation portfolio management is like venture capital investing, early stage investing, where it's impossible to precisely predict the winners, but nevertheless a

9 http://www.shell.com/home/content/innovation/bright_ideas/game_changer/

few great successes will more than make up for many failures.

If we knew which projects were going to fail, then of course we'd stop working on them. But we don't know, and that's the charm of pursuing innovation, as well as its unceasing annoyance.

In fact, a healthy percentage of projects *should* fail, because failure is an indication that we're pushing the limits of our current understanding hard and persistently enough to be sure that we are extracting every last bit of value from every situation, and at the same time preparing for a broad range of unanticipated futures.

Given these factors, the process of creating, developing, and managing innovation portfolios shouldn't be handled from the CFO's perspective as a purely financial matter since these mandatory investments include a greater degree of ambiguity than most other forms of investment. Instead, the finance office and the chief innovation officer are partners in the process.

Discipline is essential to success, and so is encouragement. At Tata Group, one of India's most respected companies, an annual awards program for innovators from across the company celebrates dozens of teams that have tried and succeeded with new ideas. A few years ago, a new award category was added to the Innovista program, an award for projects that were not successful, but which constituted commendable failures. So when company chairman Mr. Ratan Tata stands up in front of an auditorium packed full of people to announce the award winners in the "Dare to Try" category, he sends an important message to the entire company about the necessity of innovation and the willingness of Tata senior management to embrace failure on the way to ultimate success.[10]

Dare to Try is defined this way: "This award is given to the most daring team which made a sincere and valiant attempt for a major innovation but could not obtain the desired results. We all know that 'intelligent failures' are stepping stones for path-breaking innovations. This award celebrates that spirit."

Since you're going to design your portfolio, you'll also design the criteria according to which you're going to assess its performance. What you measure in business has decisive impact on what your organization delivers, so as you proceed you'll need to think about what you really do need to measure. The topic of metrics will be taken up in detail in Chapter 6, where I'll discuss possibilities you may want to use in assessing your portfolio's performance.

Think of your innovation portfolio as a tool to help you manage risk and get the best possible return for the capital you have to invest. It has to be designed thoughtfully, with due consideration for the strategic factors that are driving your business and your industry forward. Taken together, the projects that you select are the ones you believe most likely to enable you to achieve your strategic goals, to compete effectively and create competitive advantage, to grow your business, to sustain your success.

Implementation of the portfolio occurs throughout the subsequent stages of the innovation process, which means that it will take some time before you know if the

10 Please Google "Tata Innovista" for more information.

portfolio you designed actually delivers the value you intended.

Over time, as you manage toward this ideal portfolio, your team's ability to assess individual projects will improve, and the capacity to create value through the entire process will improve as well. As the projects that constitute an innovation portfolio mature they will provide senior executives and board level directors with increasingly attractive new investment options, and thus a welcome (and expected) return on the invested efforts and funds.

•••

Please return to InnovationManagement.se for the subsequent chapters of *The Innovation Master Plan* by Langdon Morris.

You can learn more about his work and access additional writings and his blog at www.innovationlabs.com.

About this Book

This book is intended as a companion to my previous innovation book, *Permanent Innovation*.

During the four years since *Permanent Innovation* was completed, we've continued to refine our understanding of the innovation process through work with many organizations, and we've found that senior managers have a continuing interest in guidance in the design and management of their innovation initiatives. *The Innovation Master Plan* addresses many of those needs, and deals with aspects of the innovation process that *Permanent Innovation* didn't address.

In the course of preparing *The Innovation Master Plan*, I've also discovered some opportunities to improve *Permanent Innovation*, and as a result a revised edition is now available.

(You can download *Permanent Innovation* at
www.permanentinnovation.com)

About the Author

Langdon Morris

Langdon Morris is a co-founder and partner of InnovationLabs LLC, one of the world's leading innovation consultancies. He works with organizations around the world to help them improve their proficiency in innovation.

He is Senior Fellow of the Economic Opportunities Program of the Aspen Institute, Editor of the Aerospace Technology Working Group Innovation Series, Associate Editor of the *International Journal of Innovation Science*, a Contributing Editor and Writer for InnovationManagement.se, and a member of the Scientific Committee of *Business Digest*, Paris. He is formerly Senior Practice Scholar of the Ackoff Center of the University of Pennsylvania and Contributing Editor of *Knowledge Management* magazine.

He is author, co-author, or editor of eight books on innovation and strategy, various of which have been translated into six languages, author of many articles and white papers, and a frequent speaker at workshops and conferences worldwide.

He has taught or lectured at universities in the US, France, Portugal, Taiwan, and Argentina, including Stanford University, the Ecole Nationale des Ponts et Chaussées and the Conservatoire National des Arts et Métiers, Paris, the University of Belgrano, Buenos Aires, and Chaoyang University of Technology, Taiwan.

early praise for

The Innovation Master Plan

"A fantastic piece of work, and a guide you must hold at hand when traveling in Innovation-Land. Use it as a reference in outlining your plan to future growth and profits. The business world has to be different, just start to build it ... with this Master Plan."

Léopold Demiddeleer
Solvay

"Authentic Leadership among the companies of the 21st century is naturally a commitment to sustainable growth, profit, and image. And this can only be achieved with a complete dedication to sustainable innovation at the core of the organization. Langdon Morris' intelligent, passionate and inspiring messages in his master plan make sustainable innovation possible. This dynamic, focused and simple process takes us from concepts and ideas to reality. It is hugely important and productive to guide us in creating valuable innovations for our organizations. Langdon is a true innovation leader, and wherever you are in your innovation journey it is wise to follow these best principles."

Signe Gammeltoft
L'Oréal

"*The Innovation Master Plan* is another revolutionary innovation masterpiece by Langdon Morris, a framework which brings practicality to the concept of innovation. This book will compel and inspire any executive reader to adopt an innovation culture and framework for their organization in order to survive and succeed in the 21st century."

Genevieve Bonin
PwC

"*The Innovation Master Plan* is one of those books that captures your imagination and keeps you grounded in reality at the same time. Langdon Morris describes the driving forces impacting our businesses and the worlds we live in everyday. He exposes how the 'great ones' have innovated, and provides one of the most simple and powerful models to transform your business and empower people to be more innovative; altering the innovation landscape. A powerful call to action!"

Jacqueline Byrd, Ph.D.
Creatrix, Inc.

"For anyone who is wrestling with the challenges of innovation in their organization *The Innovation Master Plan* is a must read. Langdon offers a comprehensive handbook that maps this uncertain territory by asking (and helping you answer) five key innovation questions; Why? What? How? Who? Where? Having taught "Needfinding" and design research methods at Stanford for the last 2 decades, it's clear to me that this book is a significant contribution to the field that will benefit students and experienced practitioners alike."

Michael Barry
Stanford University and Point Forward

more praise for

The Innovation Master Plan

"I love this book a lot.
I can be an innovation leader, because I keep providing my own industrial and educational visions to the related parties.
I can be an innovation champion, because I support all kinds of innovation activities in the industrial and academic societies.
I can be an innovation genius, because I learn, think and practice all sorts of innovation methodologies.
Most of all, I can be a master of innovation."

Justin Lin, Ph.D.
Chaoyung University of Technology

"Thought-provoking, enjoyable, and indeed inspirational! The key messages here are incisive and convincing. A very worthwhile achievement that deserves the widest readership."

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