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# the innovation master plan

the CEO's guide to innovation

by langdon morris



this excerpt includes

## chapter 5

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).

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## The Innovation Master Plan

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ISBN #: Forthcoming  
[www.innovationlabs.com](http://www.innovationlabs.com)

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## chapter 5

# how to innovate

## the innovation process

“Great companies cannot be built on processes alone, but believe me, if your company has antiquated, disconnected, slow-moving processes – particularly those that drive success in your industry – you will end up a loser.”<sup>1</sup>

Louis Gerstner

Innovation is obviously one of the key business processes that drives success. It is, however, often misunderstood.

And one of the major misunderstandings is the confusion between “ideas” and “innovations,” as the following story will illustrate.

Not long ago I was talking with an executive who was dissatisfied with the innovation results his company was achieving. He knew that his firm wasn't producing enough innovations to meet their future needs, nor were they producing innovations of sufficient quality. Furthermore, their efforts to improve the innovation system weren't working very well. (I mentioned this situation earlier, and now I'll tell the full story.)

I asked him to explain to me how their process worked, and he told me about their elaborate system for gathering ideas from across the entire company. He was quite enthusiastic about this, and thought it was going well and would lead to success.

The person actually in charge of the project, the innovation manager, was a bright and enthusiastic young guy who was collecting ideas from many people at all levels of the company. But the executive then noted that most of the ideas were incremental rather than the breakthroughs they were hoping for. Furthermore, a lot of the ideas just weren't very good.

What he had, in fact, were not one, but two broken systems.

I recognized his problem, as I had heard the same story before. In fact, it wasn't even the first time I'd heard it that same week. It's a common problem, and in the last few years I've had conversations with dozens of executives – in high tech companies and energy companies, aerospace, health care, and consumer goods, and even universities and government agencies. They all complain that their innovation

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<sup>1</sup> Louis V. Gerstner. *Who Says Elephants Can't Dance*. HarperBusiness, 2002. P. 232.

systems are broken; they know this because they're not getting good enough ideas.

The underlying problem that these executives share, the common root cause of their dissatisfaction, is that they think they can fix a broken "innovation system" with improvements to their "idea system."

It never works, because "ideas" are not "innovations," and "idea collection" is definitely not "innovation management."

Yes, ideas are certainly an essential part of the innovation process, but the distinction between ideas and innovations is missing, and there are other aspects of the innovation process that are essential to success, but frequently get insufficient attention.

Idea collection systems are based on the expectation that people will share their good ideas, but as this is happening at random, there's no reasonable basis to suppose that they really will be good ideas, let alone great ideas. Experience has shown that in fact what usually turns up are a lot of bad ones and old ones.

This should not be surprising if we've done nothing to stimulate or encourage breakthrough thinking, as opposed to incremental ideas, so of course most of the ideas that turn up are incremental. They arise during the regular course of the work day, when people are generally focused on getting their work done, so of course they pertain exactly to what people are doing at the moment.

To create a realistic possibility of breakthroughs and new business model innovations, and to improve the quality of everyone's ideas of all types, incremental and breakthrough and business model, you have to structure the process in a much more purposeful way.

And just in case you're thinking that success is a question of how much money you spend, please think again. Recent studies show that success at innovation is not a function of how much you spend on R&D, but rather on the quality of your process.<sup>2</sup>

So here I'll describe the same process that I recommend to executives who want to know how to get better results from their own investments. Please keep in mind that the goal is not to get more ideas, but to get better ones, an abundance of great ideas that are fully aligned with your organization's strategic goals.

## the innovation funnel

Given the uncertainties of the future, the nebulous nature of many ideas, and the additional uncertainties related to turning ideas into business value, it's obvious that a lot of ideas are typically explored in the early, formative stages of the innovation process, they're studied, worked on, combined and recombined, edited in and out, up and down, and deeply massaged in order that the end result is a few completed, highly useful innovations.

Since there are many ideas in the beginning and fewer at the end, it's easy to visualize the innovation process as a funnel with ideas coming in the wide end on the

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<sup>2</sup> [http://www.booz.com/media/uploads/Innovation\\_1000-2009.pdf](http://www.booz.com/media/uploads/Innovation_1000-2009.pdf)



left, getting magically transformed through a lot of hard but mysterious work inside, and then a few finished and magnificent innovations emerging triumphantly to market through the narrow end at the right.

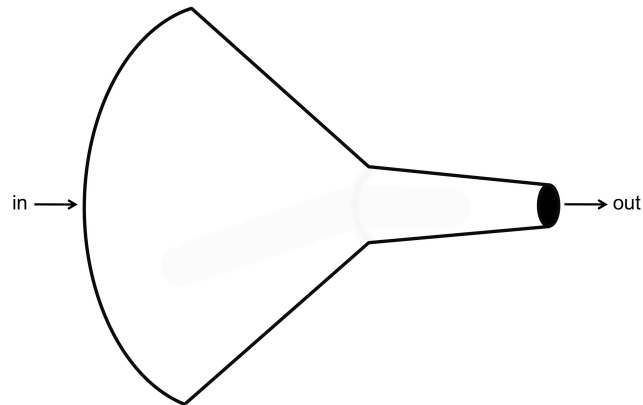


Figure 15  
The Innovation Funnel

What happens inside the funnel are steps, or stages of work progressing from vague to very specific. At the end of each stage is a check point, a gate, and only the good ideas get past a gate and go on to the next stage. Companies may define the steps or stages differently, but the metaphor of the funnel consisting of stages endures, and “stage gate” models also endure because we know that we have to exert some influence over what happens inside the funnel since there’s too much money, importance, and risk involved to leave it unattended.

But as the story above suggests, starting with idea collection really doesn’t work at all, and in many organizations it ends up being counterproductive.

Ideas are of course the seeds of innovation, just as ore is taken from the ground as the raw material of steel, and waving fields of wheat provide the raw material for bread. But it takes a lot of preparation work to get raw ore from a mine and transform it into steel, and likewise there is work involved in preparing a farmer’s fields to grow the wheat long before there’s any grain to harvest or bread to eat. It’s the same with innovation; we just don’t start by collecting raw ideas, because we have a lot of preparation to do first to ensure that we get good ideas. It has to be a system.

### a systematic process

Those who start their innovation process with idea gathering are starting in the middle, and as they haven’t done the necessary preparation they probably won’t end up with the high quality ideas they want. To carry the mining and farming metaphors forward, due to the lack of preparation they end up with a lot of useless dirt, or a pile of weeds, rather than ore or wheat.

We've already explored the principle that innovation must be a core element of every organization's strategy, which is the "why," and that is the beginning the innovation process. By clearly defining strategic intent we automatically steer towards development of new possibilities that could plausibly add value at the strategic level.

But this step is omitted if we jump headlong into gathering ideas, and it's why most of the ideas that come from unstructured idea collection efforts aren't very interesting, and therefore why the results are disappointing.

Here's the entire model.

## step 1 strategic thinking

In Chapter 1 we discussed the linkage between strategy and innovation in detail. We began with the goal of creating strategic advantage, and thinking through specifically how innovation is going to add value to your organization's strategic intents, and how this will lead us to target innovation opportunities with the greatest potential to provide strategic advantage.

This is also the first step in the innovation process, through the translation of strategy into a set of specific intents and expectations.

## step 2 portfolio management & metrics

In Chapters 3 and 4 we explored the design of your innovation portfolio, and discussed concepts including the four types of innovation and the five resulting portfolios, the nature of ambiguity, and the critical principle of non-correlation. This is step two of the innovation process.

We also discussed at length one of the important underlying facets of innovation management, the necessity of failure. Innovation is by definition doing something new, and as we proceed on the innovation journey we do not in fact know if we're going to succeed with any given project or effort, but we do have confidence that we'll succeed eventually because we will learn diligently.

Along the way we know that there'll be surprises, wrong turns, and attempts that will never come to fruition in and of themselves. So we manage innovation portfolios aggressively to balance the inherent risks of the unknown with the targeted rewards of success, to assure that our bets on the future are not correlated to any particular market structure, and to balance our pursuit of the ideal with the realities of learning, risking, and failing in order to ultimately succeed.

This is the sort of situation that drives many laser-focused executives crazy, but history has shown that there's no way to avoid it. The engaged and adventurous spirit, on the other hand, is thoroughly pleased by the very uncertainties that are encountered along the way, which is fine as long as you don't lose focus on the need

to ultimately succeed, and as soon as possible.

Or in the words of Jonathan Ive, head of industrial design at Apple. “One of the hallmarks of the team is inquisitiveness, being excited about being wrong because it means that you’ve discovered something new.”<sup>3</sup>

Behind these differing personalities lies the greater difficulty, in that people in the two roles often have problems communicating with one another. Like it or not, the operating executive has to put up with the adventurer, because without adventure there isn’t likely to be innovation. The adventurer, for his or her part, thoroughly understands that delivering innovation is a strategic imperative, and is usually more comfortable with the uncertainties involved in getting there.

The crux of the portfolio as a solution is that by managing the entire collection of ideas and projects that constitute our innovations-in-progress as we would manage any investment portfolio, and by instituting the right metrics according to which we will diligently assess our own efforts and correct our course as needed, we have the best chance to arrive at our destination, competitive advantage.

Steps 1 and 2 together provide a platform and context for everything that follows, and thus they constitute the preparation stages, pre-funnel, or strategic alignment.

### step 3 research

The key outputs of step 2 are the design of the ideal innovation portfolio, which is what we believe, as of today, describes the right mixture of short and long term projects across all four types of innovation that we anticipate will enable us to achieve our strategic objectives, along with our increasing skill at portfolio management. What we actually do will doubtless be different from whatever we envision today, but that’s fine. We need clear directions in which to go, and we fully expect to learn along the way and change course as necessary, both as a result of what we learn, and as the outside environment continues to change and opens up both new threats and new opportunities.

The portfolio describes the ideal future products and services we’ll target, but even if they’re the right ones, we probably don’t yet know how to make and deliver them, because if we knew, then we’d just do it and we wouldn’t need an innovation process to get us there. So there is by definition a gap between what we know today and we *will* know once these new products and services have been discovered, developed, and applied. We compare our current knowledge with the knowledge we will need, and this shows us where the gaps are; filling them with brilliant new knowledge that leads to insights is the purpose of *research*, the third step in the innovation process.

As competitive advantage is the goal of innovation, however, and our

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<sup>3</sup> Leander Kahney. *Inside Steve’s Brain*. Portfolio, 2008, p 93.  
Ive made the comment at Radical Craft, The Second Art Center Design Conference,  
[http://www.core77.com/reactor/04.06\\_artcenter.asp](http://www.core77.com/reactor/04.06_artcenter.asp)

competition is probably busy doing the same things, the knowledge we really want and need isn't going to be waiting around on the corner in a red suit for us to cruise by. Instead, it's probably hidden, and it may require considerable skill as searchers for the unknown for us to find it.

## the knowledge domains

Although the gaps in our knowledge will almost certainly encompass a huge range of topics, it's also likely that our questions can be organized into either of two broad categories that we call "tacit" and "explicit" knowledge. Within each category there are two subcategories, and beyond that of course an infinite variety of pertinent subtopics.

Explicit knowledge is that which can be articulated and readily transmitted to others. It has been codified. Explicit knowledge domains are:

1. Science and technology, including the basic sciences, such as physics or chemistry or biology, emerging fields such as biotech or nanosciences, and applied fields like computing and the internet. These are abundant sources of new explicit knowledge.
2. Business disciplines, such as manufacturing, supply chain, finance, marketing, and communications are rich with explicit knowledge, as is knowledge pertaining to the current and observable *uses* that consumers make of products and services.

Tacit knowledge is difficult to transfer to another person, often because it includes unspoken or unrecognized elements or components. Tacit knowledge domains are:

1. Large scale social and economic trends that define the flowing and changing world of events, trends, beliefs, attitudes, and values, but which are often hard to track to a source, and which are highly unpredictable.
2. Customers often make choices according to unspoken needs, desires, and behaviors (which are also changing), and also according to the hidden *meanings* that products and actions contain for them.

The knowledge we seek will most likely be found in all four of these domains. We'll have to integrate together whatever we learn in order to create robust solutions, using new knowledge to transform a wide range of unknowns into knowns, and through which to expose significant new innovation opportunities.

In many situations, often the most interesting and compelling ones, the convergence of new science, technology, and business tools with social and economic trends and customer needs leads to the creation of new markets. Here the explicit and tacit come together, and it's where we probably want to be exploring to assure the future of our organization.

This is a tall order, though, and we've got to be careful not to underestimate the intellectual challenge as well as the management challenge of doing it well.

Let me offer some concise examples, just to ground this important concept in stories that that you may already be familiar with.

The most successful of the internet companies, including eBay, Yahoo, Google, Facebook, and Amazon, to name five, all exist because of a new technology (which is also a new tool), the internet (explicit knowledge), and they are surfing on (and have created) large scale social trends to fulfill previously unmet needs that address meanings that are important to users (tacit knowledge). eBay, of course, a new kind of consumer-to-consumer marketplace, has largely replaced the garage sale with something far more effective; Yahoo and Google have redefined how people get information, and how advertisers try to reach the very same people while they're getting information; Facebook is a new kind of community, and Amazon leads the way in the distribution of every kind of product imaginable.

More or less the same story could be told to explain the successes of Apple and Microsoft, and before them Xerox and IBM, and P&G, and Starbucks, and Wal-Mart. If we look by industry, we see much the same thing – airlines and aircraft manufacturers; energy companies; food companies; distribution companies; technology companies; even financial services companies, all use science and technology, and business knowledge (explicit knowledge), to address market trends and emerging and often undefined customer needs (tacit knowledge).

So let's explore what research in both areas could mean.

## explicit knowledge

Research in the sciences and in technology follows a well-understood pattern. The exploration of basic concepts leads to suppositions about how things “could be,” which then take the form of hypotheses. Scientists design experiments to test hypotheses, and then compare the results with their expectations. The name for this is “the scientific method,” the disciplined approach to obtaining repeatable results.

In this way, explicit knowledge accumulates day by day, year by year, generation by generation. This has been the pathway of science throughout the course of human history, the process driving the growth of human knowledge. Newton famously remarked that he stood on the shoulders of giants, and then subsequent generations of scientists have stood on *his* shoulders, leading us to the present day when we all stand upon the towering edifice of the accumulated knowledge of civilization, a vast collection that continues nevertheless to grow every day through the efforts of countless scientists, scholars, and students.

The accumulating store of human knowledge is expanding at a phenomenal rate, now doubling every few years, and leaving us with an inexhaustible supply of facts, models, and concepts at our disposal. For example, about 30 million different chemical substances are known to exist, and new ones are being developed every day; perhaps one of them will pertain to your business.

For businesses, certain types of new ideas and knowledge are protectable through the patent process, which takes new concepts, expresses them in explicit terms, may result in competitive advantage and valuable assets that can be defended in courts of law.

And similarly, all the other domains of business knowledge contribute to our ability to design and manage global enterprises that serve millions of customers, and organize tens or hundreds of thousands of employees and suppliers into coherent operations that address market needs on a local or global scale to earn revenues and profits, constituting the economy.

## tacit knowledge

Since businesses must have customers, and customers often make choices according to non-obvious criteria, our quest to understand who they are and what they want, and to understand the evolution of our society and the current and future values and needs of customers as large groups taken together as segments and markets, leads us to inquire not only as to how technology works, but also what users want and need to do with it, what it means to them, and especially what they'll buy, and why. Therefore, we also require another type of knowledge, knowledge about people, and their views, and the choices they make. We call this "tacit" knowledge.

Unlike the explicit nature of the hard sciences and many business disciplines, our understanding of human behavior is developed by the social sciences, including anthropology, psychology, sociology, and economics. These fields explore hidden and unspoken understandings, tacit understandings, which often constitute the most interesting and important aspects of human communications and human life. These are also the elements that compose human culture, the subtle and elusive factors that shape our values, beliefs, and attitudes, telling us who, at root, we are.

The accumulation of knowledge in the explicit domains of science, technology, and business is as old as humanity, and it's well understood. The tacit domains, however, while equally old, are much less well understood in the business context, so I'll describe them here in more detail.

While explicit knowledge of the sciences is shared through verbal and written expression and through communications media, tacit knowledge is almost always communicated subtly, through body language, and unspoken agreements, and through cultural norms and values that everyone who lives in a particular place and time automatically learns, although they are rarely discussed openly. As part of a community we learn what clothes to wear, and which flag to wave, and which car to drive, and what behaviors are proper and improper, and all that and much more expresses important aspects of our identity. The norms that we often feel compelled to conform to are our culture, communicated to us throughout the days of our childhood in thousands of ways that are spoken, but millions more ways that are demonstrated just in the course of living. Culture is the aggregate expression of the spoken and unspoken elements of a shared sense of who we are.

For most of us, the choices that define a cultural identity constitute "common sense," as they're what we feel, believe, expect, and even experience, although the concepts we use to organize our approach to "reality" are often beyond conscious awareness.

Cognitive scientist George Lakoff has put this very simply: "One of the most fundamental results in cognitive science, one that comes from the study of



commonsense reasoning, is that most of our thought is unconscious - not unconscious in the Freudian sense of being repressed, but unconscious simply in that we are not aware of it. We think and talk at too fast a rate and at too deep a level to have conscious awareness and control over everything we think and say. We are even less conscious of the components of thoughts - concepts. When we think, we use an elaborate system of concepts, but we are not usually aware of just what those concepts are like and how they fit together into a system.”<sup>4</sup>

In this comment Lakoff has explained not one dimension underlying the tacit dimension, but two. First, he says, too much is happening in our brains for our conscious mind to be aware of it all.

A good question at this point would be to wonder why so much of our experience remains beyond our conscious awareness. Studies of the human brain reveal that the sensory organs generate information at a prodigious rate, as the combined channel capacity of the nerves associated with the eyes, ears, skin, taste and smell systems is on the order of eleven million bits of data per second. Meanwhile, consciousness lags considerably behind at a paltry forty bits per second.<sup>5</sup> This means that the brain is processing approximately 300,000 times more information than consciousness is made aware of, and by default our system of consciousness is therefore obliged to filter the flood of experiences into the limited capacity of our conscious awareness.

Lakoff's second point is that we organize reality into concepts, but we generally do so without significant awareness of where the concepts come from or how they fit together. We learn them as a natural part of our maturation, and they sneak into our being in such an insidious way that they are integral parts of us, so much so that we often cannot imagine our lives or ourselves any other way.

But people who were raised in cultures other than our own may indeed have been raised differently, and the “other way” that is inconceivable for us is entirely natural and normal for them.

Conflict between cultures then often arises when people have different and perhaps opposing concepts, models, or cultural norms. Religious, ideological, and political discord is often the result, which may even lead, as we see far too commonly in today's world, to war.

Conflict also occurs within cultures, often when change occurs in the broader environment that causes the prior norms to be in opposition to a new reality. Hence, technological and social change often leads to generational conflict when succeeding generations may have vastly different experiences of what reality is, or views of what it should be, than their parents and grandparents. What constitutes “proper behavior” comes into dispute.

A somewhat trivial example of this, but one that you may well be familiar with, is social etiquette around texting. It seems that many people in their twenties, for whom texting is an integral part of their experience, think it entirely normal to send and receive text messages any time, including during conversations, meetings and

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4 George Lakoff. *Moral Politics: What Conservatives Know that Liberals Don't*. Chicago, The University of Chicago Press, 1996.

5 Manfred Zimmermann. "Neurophysiology of Sensory Systems." *Fundamentals of Sensory Physiology*, Robert F. Schmidt, ed. Berlin, Springer-Verlag, 1986. p. 115.

meals. However, many people in their fifties, for whom texting is not at all a part of their way of life, find this rather offensive.

A non-trivial example of this type of social conflict is the conflict that we know as the uprising of Tiananmen Square, which gave all the appearances of a cultural conflict between youth and elders, underlain by different views of history and of the future. (Although it may also be explained as a more traditional power conflict between those who had it and those who wanted it.)

Either way, it remains difficult to resolve disagreements when our beliefs are assumed rather than studied, and the roots of our values are hidden, which is precisely what we mean by “tacit.”

This discussion is important because these tacit factors are often most critical to the success of innovation efforts, in that the design of every innovation must address the tacit factors just as it must also address the explicit ones.

Therefore we need to conduct research that exposes these hidden elements; we call this “tacit knowledge research.”

What we wish to accomplish through tacit knowledge research is to develop a detailed understanding, or model, that explains how people think, and why they think as they do, and thus why they make the choices they make in any particular situation as it pertains to our company, our products and services, our industry, our future, and our innovations. This sort of investigation is quite different from the hard sciences, and requires different tools.

A reminder of tacit factors in product design is provided by the simple example of the humble car key. Today it's the standard design that a single key both opens the doors and starts the car, and since the key is symmetrical it works facing either direction, which assures 100% success putting the key in the lock or the ignition, 100% of the time. But for decades, American car makers provided one key for the door and the ignition, and a different one for the trunk. These keys were non-symmetrical, so the teeth were only on one side of the key, and it fit in the lock only one way. So imagine that it's a dark and rainy night, and you're fumbling for your keys while getting soaked, because you forgot your raincoat. You have only a 25% chance of getting the right key into the lock correctly, so three chances in four of getting wetter and more uncomfortable. Eventually the Japanese innovation, the single, symmetrical key, became standard, because it works so much better.

From the perspective of the product designers, in this case the key and lock designers, the insight that leads to a symmetrical key comes from studying the experiences of end users. Here is a person with key in hand trying to get into the locked car, and the designers observe what happens and think through the factors that will make that experience as easy as possible.

While this is a simple example, the type of thinking that it requires is useful in an infinite variety of innovation challenges of far greater subtlety and complexity. We wish to expose tacit knowledge that is embedded in the experiences of individuals and in the collective psyche to understand the elusive factors that will enable us to design the best possible solutions. To gather this knowledge, researchers often conduct detailed interviews with people who represent a particular set of relevant characteristics, such as age, socio-economic group, job type, a particular interest or avocation, or a geographic segment, etc.



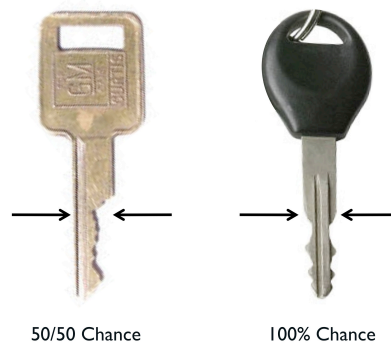


Figure 16

Sensitivity to Tacit Knowledge Improves the Design of the Humble Car Key

For example, we may want to learn about the needs of aging Baby Boomers:

- Will people age 50 or so be interested in this particular product?
- How can we design it to meet their specific needs?
- What meanings do other products in this category convey?
- Is there already a product or service on the market that addresses this need?
- Can we improve on it?
- How should we market it so that customers become interested in it?"

Researchers have discovered, however, that just asking questions like this is unlikely to yield good results precisely because so much of our experience occurs without conscious awareness. So we need a different approach.

## ethnographic research

A highly productive method of exposing tacit knowledge is the discipline of ethnography. Originally developed as the branch of anthropology that focused on understanding human culture, ethnographers perfected their discipline by immersing themselves in cultures other than the ones in which they were raised, and decoding the patterns of belief and interaction to give us valid models of how others live.

They've also been working for the last few decades to understand not only the unique characteristics of humanity's diverse cultural heritage, but also the previously unrecognized attitudes, behaviors, and experiences of those who live in the world's great metropolises and participate in the global economy. This is the search for knowledge that businesses that can be transformed into commercially successful products and services.

One of the notable places where the marriage of ethnography and business first emerged was at the same Palo Alto Research Center I've already mentioned, Xerox's marvelous lab near Stanford University, where a multidisciplinary team of those working in the hard and soft sciences developed an amazing set of technologies, including the first really usable personal computers (mentioned above), laser printing, Ethernet, and countless other innovations that found their way into Xerox copiers

and computers.

Today, ethnographers are working for many companies. One of them is Intel Corporation, which is exploring the rapid spread of computing in China, an obviously important future market for the company. On an Intel web site, the intent of its ethnographic efforts are described this way:

“Our purpose is to explore fundamental paradigms and phenomena of everyday life to help Intel think critically about how people, practices, and institutions matter to technological innovation and to conceive of provocative experiences in the future. We use social science methods, qualitative and quantitative, to generate insights, models and demonstrations that help reframe 'what matters' to internal and external partners.”<sup>6</sup>

This graceful language includes some important distinctions. The focus on what matters to “people,” “practices,” and “institutions” encompasses three of the most complex aspects of the human experience, and Intel’s efforts to learn more about them involve a considerable degree of sophistication. This ethnographic work has been the subject of articles in the *Harvard Business Review*, *BusinessWeek*, and other publications, but the company is just one among many that use ethnographic research to deepen their understanding of the tacit factors that influence their customers’ views of the world.

For our purposes as innovators, the distinctions between tacit and explicit knowledge are vitally important. But to execute on our projects we also need a deeper understanding of how we actually develop and use them in practice.

## needfinding

As an example we’ll look at a recent project for a consumer products company whose goal was to double the size of its business over the coming five years. The company had a lot of ideas, but they all seemed to be unsatisfying incremental, so they initiated a project to explore the tacit factors behind customer attitudes and views about their core product and the entire category in which their product belonged, in the expectation that this would enable them to understand how the market was evolving, and thus help identify breakthrough growth opportunities.

After exploring the strategic issues facing the company, and arriving at some conclusions about the strategic framework for the project, team of ethnographers then interviewed members of 50 families in three cities over a period of a few weeks to explore their views and values in great depth. Unlike focus groups, which are usually conducted in a neutral and sterile office environment, these interviews took place in people’s homes, where it was more natural for people to discuss the product and lifestyle choices they make, their views on various topics including personal care and exercise, and a dozen additional themes related to consumer and lifestyle choices

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<sup>6</sup> <http://techresearch.intel.com/projecthome.aspx?ResearchAreaId=3>

they're making today, and which may offer insight into the choices they'll probably make tomorrow.

A peek into pantries and storage closets discloses what they'd bought, and the researchers asked them to talk about their choices. As there's often a difference between what people say and what they do, examining what they've actually bought and talking about it often reveals hidden thoughts and beliefs.

It's also common for people to describe their lifestyle habits based on what they think the researchers expect to hear, or on stereotypical notions that they apply themselves even when it's not so much the case, the actual boxes and cans on the shelves disclose what they've really chosen; this is one of many nuances that highlights the importance of the tacit dimension, of getting beyond what people say to get a clearer picture of their real beliefs and choices.

This phase of the tacit research process is called "needfinding," the search to understand hidden and future needs.<sup>7</sup>

Needfinding does not occur exclusively in the structured setting of an ethnographic research study; it can also happen on "trend safaris," when we go for a walk along main street or at the mall, looking for new products and marketing ideas, and when browsing the internet, or looking at catalogs, or even watching this year's Super Bowl ads and exploring what messages the advertisers are intending to convey.

Central to effective needfinding is the art of thoughtful and thorough observation. Ethnographers are trained to notice things that others may not be aware of. For example, the now-famous Oxo brand of kitchen tools were created to make it easier for people with arthritis to cook. And to the company's great surprise (and joy), it turned out that arthritics weren't the only ones who prefer to use tools that are easier to handle.

So we would say in this case that the industrial era "natives" remained unaware skinny handles are harder to use, and fat handles much easier, until more than 100 years after the industrial revolution began.

Needfinding is a process of seeking to understand the customer's experience, and of exposing the hidden assumptions about which we have previously been unaware, such as the difference between fat and skinny cooking tool handles. Researchers therefore look for clues that may mark unsatisfying issues and problems we might then label as ... hard-to-use; gaps in service; needs that are not met; and workarounds when people have to go to unusual extremes to solve problems ... because all these situations may expose innovation opportunities, as indeed they have for Oxo.

And while we certainly engage with existing customers in this research, we also talk with non-customers. Sometimes we refer to these two groups as "core" and "edge" markets.

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<sup>7</sup> For an excellent and detailed description of the research process that is summarized here, please see the award-winning paper "Innovation as a Learning Process: Embedding Design Thinking" by Sara Beckman and Michael Barry, *California Management Review*, Fall 2007.

## exploring core and edge markets

Throughout the process of needfinding, it matters a great deal where you choose to search. In this context we make the distinction between “core markets” and “edge markets.” Core refers to markets, services, products, and customers that are well understood, “typical,” and already targeted. “Edge” refers to special uses, extreme uses and also non-users, groups that are not considered typical, and often not considered at all.

In traditional practice, we want to understand our core customers, just like we want to master our core competences. But in the forward-looking process of needfinding, we may learn much more from the edge than we can from the core.

Learning about the edge, however, may require us to spend time with people whom we don't think of as our typical customers, and may also require us to understand a much different thinking process than the ones we're accustomed to: the arthritic kitchen tool user is indeed such an edge customer.

A brand that successfully developed itself entirely on the edge is Toyota's Scion, an example of business model innovation as well as new venture innovation that I mentioned in Chapter 3. The Scion brand is not targeted at Toyota's traditional customers in the US, mainstream baby boomers, but at their Gen X, Y, and Z children and grandchildren.

Before launching the brand, the Scion development team studied these new consumers by visiting their own communities, which were, from Toyota's perspective, edge environments: tattoo parlors, street rallies, alternative rock concerts, and inner cities where the company had neither a presence nor much experience.

As they spent time with their future customers, the Scion team began to understand how to develop a new brand identity to address the worldviews of these new customers. Team leader Jim Farley participated in many of these conversations, and it was during a 2 hour conversation with a security guard that the brand positioning for Scion came into focus.<sup>8</sup>

With a target market consisting of young buyers who were generally not established with families and careers, people who were making the transition to adulthood, the Scion team came to realize that many of them still saw themselves as outsiders. Hence, the brand identity of Scion clearly displays the rebel attitude, which you may have noticed if you've seen any of the company's striking advertising. “Often Misunderstood,” said one billboard, reflecting a common feeling among teens and twenty-something year olds.

Scion reinforced its rebel positioning by becoming the (only) automotive sponsor of an American tattoo festival, among many similar promotional efforts where they worked to build viral buzz around the brand. Their efforts were very successful, as first-year sales exceeded the forecast by 300%.

By creating an edge brand for edge customers in an edge market, Toyota expanded its customer base into a key market segment it had not previously

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<sup>8</sup> “Job 1 for new Ford executive: Selling EcoBoost.” Associated Press, January 6, 2008.  
<http://www.msnbc.msn.com/id/22527986/ns/business-autos/t/job-new-ford-executive-selling-ecoboost/>

penetrated; in 2008, 70% of Scion buyers were new to Toyota.

In these times of rapid change it's obviously risky to focus only on a core market, because markets shrink and disappear with astonishing speed. Exploring the edge may help you to identify the future, and to target innovations that will enable your company to adapt to new markets and emerging market requirements.

The observations that needfinding discloses, however, are not sufficient in and of themselves. We have to then identify the underlying patterns, which will lead us to recognize both threats and opportunities. We call the next part of the process "modeling," because here our goal is to transform needs found into useful and actionable models of the customer's frame of mind.

## modeling

While needfinding focuses on gathering information about hidden attitudes and expectations, the modeling work that comes next synthesizes these findings into concise and logical expressions that describe how people make decisions. Knowing how people decide, whether those decisions are conscious or unconscious, enables us to then shape a value proposition that will meet their needs.

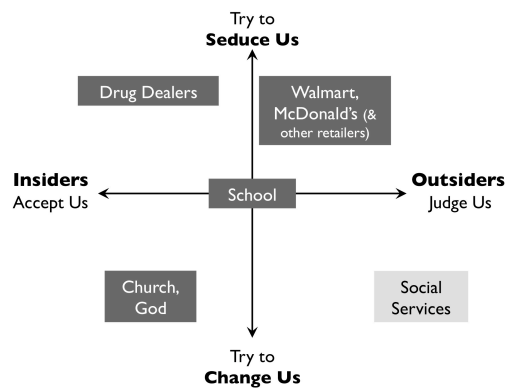


Figure 17

Example of Modeling in the Research Process:

### The Self-Image of a Troubled Community

This example was taken from another research project, and simplified for inclusion here. Drug dealing is a persistent factor in this community, and the self-image of many community members is largely influenced by the uneasy relationship between insiders and outsiders (shown on the horizontal axis), and the ways that insiders and outsiders try to influence community members (shown on the vertical axis). The research sponsor was a social services agency, and the findings revealed how they were perceived in the community: as outsiders who judge and try to change the community members. This was not a formula for success, but knowing this, the agency could then work to position itself more positively in the minds of community members.

In our project with the consumer products company, thinking through the needs as identified in the interviews disclosed some interesting surprises. The researchers learned in the earliest interviews that consumers think about the product category somewhat differently than the company's executives thought they did, and that

consumers also had a different understanding of the product's key benefits. Consequently, researchers explored these themes in even greater depth in later interviews.

Then, during the modeling phase, thinking through these differences led to key insights about the way the market seemed to be evolving. This turned out to be an early warning about an important shift in the structure of the entire market, a shift of considerable significance for the company.

Specialists from inside and outside the organization also helped model these changes, as the team looked for evidence in related fields. They also explored possible business structures, supply chain models, marketing concepts, financial projections, and risk assessments.

Insights gained through modeling still need further refinement before the more specific work of product development, as models also have to be applied, refined, and tested. So needfinding and modeling are the first two of four stages of research; what follows next are ideation, and then prototyping.

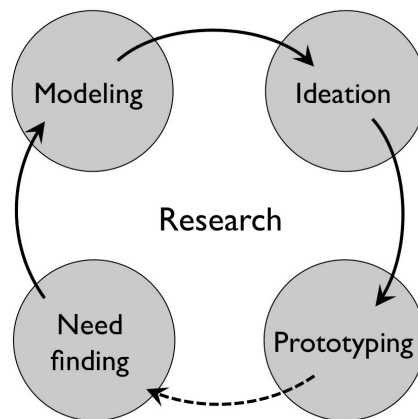


Figure 18

The Four Stages of the Research Cycle

The output needfinding, modeling, ideation, and prototyping is new knowledge about the future.

## ideation

Yes, *now* we get to the ideas.

We take the research results, needs found, and the resulting models, and combine them with important facts we've gathered about science and technology (the accumulation of explicit knowledge), to come up with ... ideas. Perhaps zillions of them.

You remember the executive I was mentioned at the beginning of this chapter, the one who had confused his idea gathering system with an innovation system, and who was also unhappy with the quality of the ideas his system was collecting? Well, hopefully now you understand his problem.

It's simple, actually – his company's process started in the middle, with ideation, instead of at the beginning, with strategies. To summarize briefly, the master plan

framework calls for us to arrive at ideation after thinking strategically to clarify our goals and intent, designing a portfolio, and then researching to fill the important gaps in our knowledge.

But his company, like so many others, skipped portfolio design and the needfinding and modeling portions of research. With no solid picture of the current or future needs of customers, and no clear understanding of the important tacit factors, what they got was a random collection of ideas instead of a strategically focused set. Would those omissions lead to concepts that were likely to be weak? Of course.

So what kind of ideas are we looking for? It depends ...

Does our strategy call for process improvements to lower our costs because we're competing in a commodity marketplace? Then the innovation process has to help us do that. Do we need breakthrough new products and services to compete in dynamic markets? Then innovation must help us find them. Do we need new business models to help us adapt to rapidly evolving conditions and changing customer needs and expectations? Then innovation must give them to us. Are we too concentrated in a core market? The innovation must expand our view into the edges.

<b>Universal Search Methods</b>	<b>Outside-in &amp; Peer-to-peer</b>
1. Questions.	1. Open Innovation
2. Ethnography	2. University Partnerships
3. Innovation SWAT Team	3. Customer relationships
	4. Customer Research
<b>Trend Gathering</b>	5. Joint Research
1. Competitor Intelligence	6. Idealized Design
2. Economic Forecasts	
3. Trend Safaris	<b>Future Dreaming</b>
4. Market Analyst Reports	
5. Think Tank Studies	<b>Idea Hunting</b>
6. Advisory Boards	1. Customer Surveys
7. Conferences & Trade Shows	2. Learning Expeditions
8. Periodicals	3. Insight Workshops
9. Structured Reading	4. SWOT
10. Success Stories	5. Creativity Techniques
11. Periodical Scanning Services	6. Scenario Planning
12. Online Trend Tracking	7. Pattern Analysis
13. Weak Signal Research	a. White Space Mapping
	b. Technology Roadmaps
<b>Problem &amp; Solution Finding</b>	c. Profit Pattern Analysis
1. The Learning Curve	8. Brainstorming
2. Root Cause Analysis	9. Drucker's Tough Questions
3. Systems Thinking	10. Idea Rooms
4. Collaborative Design	11. Idea Vaults Or Repositories
5. Design Methodology	12. After Action Review
6. Ideation Workshops	13. Customer Visits
7. Corporate Strategy	
8. Quality	<b>Appreciative Inquiry</b>
9. Open Space	

Table 2

48 Ideation Methods

For more detail please see Chapter 6 of *Permanent Innovation*,  
 the companion volume to this book.



Often when discussing ideation, people automatically think of brainstorming, which is a process groups use to take a bunch of information as the basis for coming up with new ideas. Brainstorming is fine, but there are a lot of other approaches to explore, dozens of ways to generate ideas. In the companion to this book, *Permanent Innovation*, I've offered a detailed discussion of ideation that covers seven major approaches and then organizes them into 48 different specific processes.

## the ideation sandbox

These processes are tools to bring to your “ideation sandbox.” A sandbox is a special place where pliable sand and the fertile imaginations of children create limitless possibilities for exploration and discovery. This is the ideal destination for children's wildly irresistible creative play: a sandbox can be a rocket ship or a sailing ship, a tea party or the princess's valentine ball, a mighty fortress, and perhaps a fancy resort hotel, all within the space of minutes, as children imagine themselves in various iconic roles, as heroes, champions, parents, explorers, kings and queens, scientists, doctors, and soldiers through endless improvisation, imagination, role playing, negotiation, and interchange.

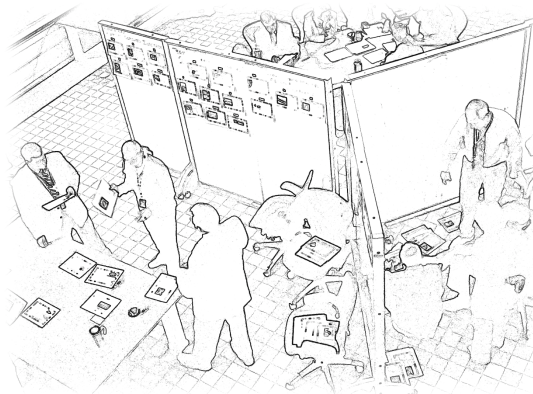


Figure 19

Ideation: Three Breakout Teams Working in Parallel on an Ideation Challenge

Our sandbox for grown-ups is the realm of endless ‘what if...,’ the place where many explorers congregate, discuss, and discover together. It's brainstorming. It's tinkering. It's wondering. It's arguing, sometimes, but in a good way, as we gather the needs and models and knowledge and discoveries that our tacit and explicit research has exposed, exploring what it all might mean for existing and future products, services, processes, and business models.

## spontaneous ideation

This doesn't mean, by the way, that we dislike spontaneously generated ideas. In fact, we love them! We encourage idea development and idea sharing everywhere in our organization and across all aspects of the business. In fact, we expect it. We



maintain a system that encourages people to share their ideas, and there are coaches who they can talk with to help define and develop their ideas, and we'll certainly give those ideas good attention. (The coaches are probably "innovation champions," whose role is described in detail in Chapter 7.)

And we also systematically engage our customers as innovation partners, and invite them to share their thoughts, needs, and ideas. (Our open innovation approach for doing this is described in Chapter 9, as part of the innovation infrastructure.)

So while randomly generated ideas are welcome, and perhaps important and necessary, we know that they're not sufficient. We're not counting on people to randomly wake up in the morning with great ideas that will shape our organization's future, and we're not waiting for that to happen. Instead, we're structuring a disciplined process to create great ideas, and to turn them into business value.

So what do we do with the ideas we come up with? We combine them, and recombine them to create even more possibilities. But why bother with that?

## creative combination

In any ideation process the first ideas that come out are almost never the best ones. Ideas have to be mixed and blended, combined and recombined, to find the gems that will *really* work, so an important part of the ideation process is called "creative combination," where we take ideas and mash them together.

This is also how a great many innovations originate, although not from a single innovator's effort, but from the accumulation and integration of progress over time, and then the combination of disparate elements into new systems and solutions. As scientist John Holland points out,

"Many of these new combinations come about through cross-breeding of successful patterns from diverse areas or disciplines. The internal combustion engine represented a major innovation in that it created a mobile source of power. The building blocks for the internal combustion engine had been around for a very long time, including gear wheels and the carburetor. The innovation was the combination of these building blocks to yield an entirely different result."<sup>9</sup>

James Burke tells a similar story about the telephone. He points out that Alexander Graham Bell's invention was a synthesis, and a brilliant one, of work done by a series of scientists over the previous 100 years, including Dane H. C. Oersted, Englishmen William Sturgeon and Michael Faraday, German Hermann von Helmholtz, and Frenchman Leon Scott.<sup>10</sup>

We apply the same approach in a compressed time frame by taking the results of ideation, both systematic and spontaneous, and adding research findings from both

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<sup>9</sup> John H. Holland. In presentation the Credit Suisse First Boston Thought Leader Forum, 2000.

<sup>10</sup> James Burke. *Connections*. Little Brown and Company, 1978. P. 78.

the hard side (science, technology, and business) and the soft side (tacit knowledge) to stimulate us to develop and explore a broad range of recombined ideas across a wide range of internal and external topics. We work with an abundance of material that is not so raw, and much of it is already and automatically aligned with our strategic intent because it came about as a result of the direct linkage we have forged between strategy, portfolio design, and research.

During our consumer products innovation project, some new concepts emerged from our discussions that appeared to address new needs, and therefore would possibly be successful in the changing market structure that was also emerging.

Market research gathered from public sources suggested that the strategy of a major competitor was also shifting, which implied that the competitor's own research into these same market dynamics may have been helping them to recognize that a shift was taking place. This had significant implications not only for the specifics of the product development we were focusing on, but also for the strategic direction that the company would pursue for the coming five years, and its competitive positioning vis a vis astute and well-managed competitors.

This is an example of how learning in the heart of the innovation process influences our thinking at other steps as well; the product management team went back and reexamined the innovation portfolios now that a new strategic threat had been identified.

Creative combination resulted in clearly defined and bounded ideas for future products, services, business models, branding, and even customer communications. The funnel metaphor was clearly evident here, as hundreds of ideas had been proposed and explored, dozens modeled in detail, tens have been mashed up in creative combination, and finally eight detailed concepts remained.

## prototyping & testing

What did we then do with the eight concepts? We had to find out what consumers really thought of them, and if they would in fact address the tacit needs that were exposed in needfinding. So the fourth and last step in the research cycle, prototyping and testing, was the process through which we translated product and service ideas into tangibles that we could see, touch, taste & smell (especially if it's food), and certainly use.

This step is critical to transforming concepts into workable form that can be evaluated not only for fit with the needs and desires of customers, but also for manufacturability and packaging, or service delivery, as well as for design refinement and cost modeling.

So the ethnographic team went back to the field to show concepts to consumers and get their reactions. People were excited about some of the concepts, while others were rejected outright. Overall, the net result of these tests brought the picture of a changing market into clearer focus and helped to pinpoint the best opportunities.

The fact that some of the tested concepts worked well and others failed is entirely to be expected, and it's a positive outcome. If all the experiments had succeeded then

it would have meant that the range of ideas that we tested would have been too narrow; to ensure that a healthy innovation portfolio does indeed include concepts that probe beyond the range of the current market, the concepts that are tested in prototyping must go beyond “reasonable” to help identify the exact location of the boundary.

The Scion team had a similar problem, because their new brand was specifically directed at a market that they were still learning about. Consequently, they decided that while the brand would consist of three different models of cars, a coupe, a boxy van, and a sedan-like compact, they also recognized that since they were still learning about the preferences of the target market, they would have to choose body styles that pushed the limits of what were considered acceptable from a styling perspective, with the explicit expectation that one of the three models would fail in the market. This, they reasoned, was the best way to learn for sure what would work for the brand, and what would not. They were therefore prepared in advance to discontinue any failing models fairly quickly after the Scion launch.

Prior to the launch they designed a simple but powerful experiment: each team member made a prediction as to which model would fail, a fun, informal, and important test of their understanding of the market. As it happened one of the styles did indeed fail. But it wasn't the one that anyone had predicted; instead, the failure was the most “conventional” of the three cars. This, they understood immediately, meant that the rebel attitude preference of the market was even further advanced than they had realized, and that the market was absolutely ready to embrace the image of the rebel attitude that the brand concept was expressing. The failed style was replaced within a year, and their marketing efforts pushed further into edge territory in embracing the rebel positioning.

The purpose of such experimentation is to determine where the boundaries are, and because these boundaries actually exist only at the tacit level, so it's necessary to venture beyond where you *think* they are to be sure you know where they *really* are.

## experimentation and failure as prototyping

The concept of an experiment in the hard sciences is defined by the scientific method. It's an activity done to “try something,” and in a rigorous setting the attempt is made in relation to a specific hypothesis about what the outcome will be. Since the scientist explicitly predicts the result before conducting the experiment, he or she then compares the results with expectations to discern the validity of the hypothesis. The progress of science therefore comes as a result of failures and successes, where the outcomes are compared with expectations, and an explanation for the causal connection is provided in the form of an underlying theory, and then validated through subsequent testing.

The predictions made by the Scion team constituted their hypothesis; the actual sales of the cars was the experiment, and the failure of one model provided the necessary evidence of the true causal connection between the styling and customer preference. The quality of the learning outcome was significantly enhanced by the prediction > test > result cycle because it forced each person to make their

assumptions explicit, and therefore discussable.

Edison's famous experience with the light bulb illustrates the necessity of systematic failure, and also the social myths that grow around it. In looking for the best material for the light bulb filament Edison's team tested a lot of materials; most of them, of course, didn't work, or didn't work well.

When he was interviewed later, he was asked about "failing so many times." The journalist was of course expressing the common attitude that an unsuccessful experiment must equate with a failure, and therefore with disappointment, a value-laden viewpoint about the stigma failure and the joy (and necessity) of success.

But Edison interpreted the process differently. They were not failures in his mind, because with each one the research team had learned something specific. Identifying such a difference of perspective, and exploring the underlying values and experiences that would lead anyone to one or the other attitude about experimentation, success, and failure, is exactly the sort of thing that would interest an ethnographer; it is definitely tacit.

When I looked on the internet for a definitive version of the filament story I found "quotes" identifying the number of those experiments ranging anywhere from a few hundred to many thousands, which tells us that Edison's story of "failure" is still an icon in American culture that is still being told and retold, and reformulated. Perhaps this is because it addresses a concept that we're still grappling with as a society, and we haven't finished re-telling it, and revising it as we do so. This is also an example of the tacit dimension of human culture.

## sociology, demographics, economics

Regardless of what the actual number of experiments/ failures/tests really was, it's the underlying principle of experimentation that we're really interested in – we test a hypothesis to discover the result, to find out if it works or it doesn't, and through that to determine the validity of the underlying theory. In the end we're looking for the right theory, or explanation, because we want to act on it.

Therefore, we also conduct experiments in situations where we know the result but not the cause, and for which we therefore have a result but not an explanation.

In Chapter 2 I mentioned the declining population of Japan, a trend evident simply by the fact of Japanese women having fewer babies. Two intriguing questions are, Why is this happening? and What will the consequences be if it continues?, questions that seek to identify the unknown cause or causes. As these are questions of serious importance to the Japanese nation, social scientists are actively seeking answers. These will perhaps relate to the values and beliefs of Japanese women of childbearing age, and their family members, attitudes about careers and leisure time, about financial resources and family sizes, about their own culture and the future. But there could also be a medical cause, as yet unidentified.

Regardless of the cause or causes, if the trend continues then the consequences of declining population will be dramatic and decisive across all aspects of Japanese economy and society, with effects rippling outward from Japan to its Asian neighbors and across the oceans to the Americas and Europe.

For example, with a much smaller population, the Japanese market for Japanese manufactured products, including cars, electronics, food, and just about everything else, will be so much different than today that Japan's economy will be completely restructured. Housing prices will probably drop due to lower demand, and perhaps home equity for many owners vanish with shrinking prices. And will riders in the Tokyo subway experience spaciousness, instead of the cramped feeling of being sardines in a can, as they do today?

Japan's population will be aging, and every year more people will be retiring from the work force than are being born. Medical advances could extend the average life span by a decade or more, or perhaps indefinitely, amplifying the disparity. The labor force will have shrunk by more than half, so fewer than half of the jobs being done today could possibly be done then, unless every worker took on two full time jobs, which seems highly implausible. So who will be taking care of huge population of aged people if there aren't even enough people to work in the factories and the stores? Or will all the factories be entirely automated, and all the stores will be entirely self-service? If the factories are automated then maybe there will be sophisticated robots doing all the work, so perhaps no Japanese person will have to actually work at all.

Or perhaps everything will turn out completely differently. Ninety years is not so far into the future to be a topic for serious demographics, but no matter how these trends eventually unfold the implications will be important not only in 2100, but in the intervening decades, and not only in Japan.

Because as of today it's not just Japan that is experiencing a significant and steady decline in its population; 59 other nations are also at or near the point of shrinking populations, including Germany, Italy, Spain, most of Eastern Europe, Russia, and most of the other countries of the former Soviet Union.

Excellent research performed by clever researchers will explore the root causes and develop models to explain why, all of which will be essential for companies to succeed in these changing situations, and for society itself to grasp the reasons for changes that are occurring, and to make the policy decisions necessary to respond effectively.

I've focused this discussion about research by describing tacit knowledge and social science research because it's not so well or widely understood, but of course scientific and technical research is of course equally important for innovation.

So what must you do?

You must have a disciplined, systematic process to collect, model, and integrate new knowledge, both explicit and tacit. Naturally there must be people working in clearly defined roles to do it.

Success at each of these four steps requires that people and teams work iteratively, developing and testing ideas and concepts, thinking broadly and then narrowing the focus, and then broadening again. These two modes of thought are sometimes referred to as "divergent thinking," when we expand the field of view, and "convergent thinking" when we narrow and choose. Both modes are essential, and often our way of working through them is sequential – diverge, then converge, then diverge again, etc.

Throughout the research process, then, we have examined two different types of knowledge, the tacit and the explicit, in four broad categories, all of them essential to our efforts to create the future through innovation:

- An understanding of the new technological possibilities that are embodied in new scientific discoveries, developments, and methods.
- Knowledge of business practices across all the disciplines.
- An understanding of how society and its markets are evolving.
- Plus a view of future wants, needs, and motivations of current and future customers, as well as their beliefs and attitudes, focusing especially on new or previously hidden insights.

Together, these factors will converge to define changes in existing markets as well as new white space opportunities where new markets are already developing or are likely to develop.

The output of research is needs identified, models of the hidden values and attitudes that underlie those needs, concepts that address the needs and models, and prototypes of the concepts. Together, these outputs express our knowledge about a wide range of important strategic issues, which may include emerging technology, societal change, and customer values. It informs us about what customers value today and will value tomorrow.

## who?

At some point it will occur to you to wonder who's been doing all this research, modeling, ideation, and prototyping.

Technical research in the hard sciences is of course the domain of trained scientists, and if you have an R&D department that's probably where it's taking place or being coordinated. You're also working with other firms and perhaps universities to master the new scientific concepts and technological trends.

Tacit knowledge research, on the other hand, may not at first glance appear to be the responsibility of R&D, but actually it could and perhaps should be. If this requires a redefinition of R&D's overall role, that's OK, as narrow definitions of the role and purpose of R&D will limit its effectiveness if the current definition says that its role is only as a source of technical solutions.

R&D's role should encompass the entire scope of innovation, beginning in the strategic conversation, across both the hard and the soft domains, and in all four types of innovation, and certainly not just technology. If this constitutes a shift for your organization, then executing it will largely be a matter of refining your organizational culture, which we'll explore in Chapter 7.

And what about the specifics of the research tasks?<sup>11</sup>

People who are skilled at needfinding are very observant, highly empathetic, and

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<sup>11</sup> These descriptions of the types of thinking at each stage is also adapted from "Innovation as a Learning Process: Embedding Design Thinking" by Sara Beckman and Michael Barry, *California Management Review*, Fall 2007.



innately curious. They habitually explore new ideas, and they especially want to know why people make the choices they do.

Modelers, however, like to take in a wide spectrum of what may appear to be unrelated information and find the common threads that tie it all together. This is a quite different cognitive process than needfinding, so people who have strengths in these two areas should probably work together on a project team.

Ideators are different still. They like to take conceptual information and see how a wide ranging set of needs and models can be brought together to solve practical problems. They're perfectly content to explore the patterns that link dozens of ideas, and find the points of convergence that define the best possible solutions.

And prototypers like to make things, to tinker, to translate ideas into a tangible, physical form of some kind.

Of course you should have all four types of people on your innovation teams so that they can combine their strengths to achieve the best results. And it will be most natural for them to apply the diverge – converge model throughout each stage of their process, focusing progressively toward specific choices and solutions that express the best thinking that leads to the best innovations.

Through all of this work, a tremendous expeditor of the effort is the right innovation infrastructure. While a poorly designed infrastructure can slow innovation work down to a crawl, the right tools can accelerate the progress significantly. This is the subject of Chapter 9.

The goal of all the work you've done so far is to understand why customers make the choices they do today, and what they'll want, need, and buy tomorrow. You've researched, thought, ideated, prototyped and tested your way through a tremendous breadth of territory, and by now some concepts have emerged that are absolutely compelling. You have accumulated a powerful set of knowledge about the worst and best innovations ideas, and you should know what makes the worst, worst, and what makes the best, best.

For convenience, you could organize your findings into five categories:

- **Forever failures**, ideas that you don't think deserve to ever again see the light of day. (But don't forget them, or they'll keep coming back again and again.)
- **Eh**, the ideas that could work, but which no one has any enthusiasm for.
- **Interesting**, as in "that's interesting," but nothing more.
- **Not yet**, ideas that are intriguing but whose time hasn't yet come; it may one day.
- And the **Yes, gotta do it!** ideas. The ones you've got to implement *right now* because the brilliant flash of insight has illuminated your viewpoint, and it's thoroughly backed up with abundant research. Your team knows what it is and why it'll work.

## step 4 insight!

As you crystallized your work on these utterly compelling ideas, the light bulb over your head flashed brightly, and you knew you were on to something important. Eureka! The innovation and the target are mutually clarified; you understand what the right value proposition is for the right customer. While you may not feel quite like running through the street naked, you're pretty excited nonetheless.

Since you have diligently formulated and evaluated your ideas, you've moved way beyond just an intuitive feel for the rightness of these concepts; you have prototyped and tested, so you have documented evidence.

So it all fits together: evidence, experience, intuition, and tests have converged to *insight*.

As a step in the innovation process, insight isn't so much an activity as it is a peak achievement, a pause when everything comes together, and you look around at your teammates and by making eye contact everyone knows – this is it! We have a model that predicts the future. (By the way, the knowledge and meanings exchanged through eye contact are also a tacit phenomenon.)

While we may not fully understand how to implement our insights, that's why the next steps are innovation development and market development, to address and answer all the many questions that lead to successful implementation.

Nevertheless, we're now in a position to make choices about the projects that we definitely want in our portfolios, the ones we're going to invest in more heavily.

A few pages ago I mentioned that some people mistake ideation for the beginning of the innovation process. Others think that the beginning is the point of insight, and they use the icon of the light bulb to represent the entire process. But that's probably not the best model either. As you can see, in the well managed innovation effort we expect insight to come about as the result of the preceding processes and activities. Hence, insight is the *outcome* of a dedicated process of examination and development, not the beginning.

It doesn't occur because someone randomly had a good idea in the shower; it does occur because individuals and teams of people have been looking diligently and persistently for it.

Please note that the actual moment of insight may well strike someone in the shower, or while out jogging, or like Einstein, while riding his bicycle or playing the violin (he did both when he was working on a problem and had reached the point of saturation). But the necessity of the preparation leading up to that moment is the point that I'm emphasizing. Having carefully prepared ourselves, we cannot say when and how inspiration will strike, but the necessity for creative thinkers to cogitate and incubate, and let the assembled facts sort themselves out is well understood.

As with ideas, this doesn't mean that spontaneous insights are unwelcome or inconceivable, but from the perspective of innovation management we're not going to simply sit and wait for insight to arrive. Instead, we're going to pursue it aggressively in an effectively managed innovation process by engaging in careful formulation of our strategy, through portfolio design, and of course through many different types of



research. Let me just remind you again of Louis Pasteur's comment that "Luck favors the prepared mind."

Insight, as a step in the innovation process, may thus mark the moment in time when there's a meeting that involves an innovation team and senior management. Perhaps it's a portfolio review when new ideas and projects are discussed, and next steps agreed upon. The main point is that while research has been an iterative inquiry of exploration and development, at some point in time you have arrived. You collect your suitcases full of learnings, discuss them, make decisions, and disembark from research and shift to development.

The remaining steps of the innovation process are innovation development (5), market development (6), and sales (7), but they hardly need to be described in an innovation book, as the important principles and practices in these business processes are so well developed and widely understood that there isn't much to add to what's already been said and written about them. The descriptions that follow will therefore be brief, and I will mention a few books in each category that I have found particularly helpful.

## step 5

### innovation development

You've got a strategy, a portfolio and research findings. They're captured in concepts that were prototyped and tested, refined through many iterations, and that led to insights, from which you made choices. Now is the stage where rapid prototyping leads to completed innovations.

Innovation development is design and engineering to transform great concepts into finished products, services, and business designs. This should be an integrated, multi-disciplinary process that includes the researchers who still probably understand the ideas best, because they've already done so much work on them, as well as people with deep knowledge of the relevant business domains, which may include manufacturing, distribution, branding, marketing, and sales.

Market Development, labeled as step 6 (and described below), occurs in parallel with Innovation Development, because the two jobs are mutually interdependent. The decisions you make in preparing the innovation for market, and in preparing the market for the innovation, require total coordination and alignment.

Still, can you make the new product or service actually work from a technical perspective? At scale? Step 5 is where you do ... or you don't. Yes, there are still risks and unknowns here, and there are still concepts that may ultimately fail to make it to the market.

Nevertheless, here we pursue everything that's required to transform ideas into finished products. We engage in extensive engineering and lab testing, build advanced prototypes, design packaging, test assumptions, talk to customers, again, this time to learn their reactions to very specific designs, products, processes, and services. We'll also interact with potential customers and non-customers to see how they respond.

And as we develop innovations, we build very detailed business models and write business plans. In summary, we do all the stuff that's necessary have to turn a great concept into something of business value.

Some innovation development resources I have found helpful include:

- Fumio Kodama. *Emerging Patterns of Innovation*. Harvard Business Press, 1991.
- William L. Miller and Langdon Morris. *Fourth Generation R&D: Managing Knowledge, Technology, and Innovation*. Wiley, 1999.
- Everett Rogers. *Diffusion of Innovations*. Free Press, 1983.
- Philip Rousssel, Kamal Saad, and Tamara Erickson. *Third Generation R&D*. Harvard Business Press, 1991.

## project management

Project management skills are very important here. You're probably juggling the time of some specialists whose skills are in high demand on many projects and in line operations, so making their contributions as effective as possible is critical to maintaining the credibility of the innovation process, and to sustaining their willingness to participate even though they already have heavy schedules.

It is often at the project management stage that the existence of the innovation has been disclosed to customers in the ongoing effort to engage them as innovation partners, and to maintain their loyalty in the face of competing offers. Consequently, delivery commitments may also have been made.

In this situation, with the company's brand image now on the line, project managers must be, in the words of former Lucent executive René Van der Hulst, "relentless." He adds, "It is essential to involve customers in setting priorities, in deciding which features to prioritize in the event that choices must be made, and in pushing through the last minute decisions that seem always to be necessary."

And it's also important to be willing to kill projects that, in the end, even after all this effort, are *still* not going to be successful. Give them a respectful burial, learn everything you can from the experience, and move on.

The output of this step, accomplished in parallel with step 6 (below), is completed innovations, ready for market.

## step 6

### market development

Innovation managers can't be focused only on products, services, or administration to the exclusion of the critical relationships between these elements, and the equally crucial interactions between companies and their customers.

So branding and market development play critical roles in the innovation process too. For example, in the 1970s Nike redefined the nature of competition in the sports

shoe and apparel business by transforming star athletes into marketing icons, first with runner Steve Prefontaine and later of course with Michael Jordan. In so doing Nike created new markets for its shoes and clothing, and surpassed Adidas to become the global leader in a ruptured market.

Nike's core innovation was turning its sports brand into a lifestyle statement, and providing the products that linked the self-identity of its customers with world class athletes; this comes close to the ideal when we're talking about the company-customer relationship, and Nike pioneered it.

The driver of this relationship-building is market development, which proceeds at the same time as innovation development because although they handle different questions, the learning obtained in each is fundamentally important to the other.

The market development process addresses the universal business problem of how to introduce innovations into the market. It begins with brand identification and development, continues through the preparation of customers to assure that they understand, and hopefully choose this innovation, and is structured throughout as a learning process to capture new insights and ideas that may emerge as a result of the interaction with customers, non-customers, and potential customers.

An important underlying issue is that just because the innovation team got the new products or services out the door doesn't mean that your organization has the capacity to effectively market, sell, deliver, or service them. Therefore, in addition to the outward facing aspects of market development, this is also the phase where necessary internal capabilities are put in place.

Xerox provides a cautionary tale about market development. As I mentioned earlier, a very clever team of Xerox PARC scientists invented the first really usable personal computer, which included a great windows interface, a mouse, a laser printer, and Ethernet. It was already a mature technology in 1973, far earlier and much better than any of the young PC competitors could offer.

Unfortunately, the PARC team was not able to communicate the meaning or significance of its monumental achievement to their senior managers across the country in Connecticut. As a result, Xerox marketed the device as a terminal emulator for accessing the company's timeshare mainframe computers, which totally missed the real market opportunity. So while we ought to think of Xerox as the genuine PC pioneer, we instead think of companies like IBM, Apple, and Microsoft. Xerox was there first, but the company's management didn't realize where they were, and weren't able to capitalize on their amazing accomplishment.

John Warnock was a member of the PARC team and went on to be co-founder and Chairman of Adobe; he said this about the communications gap between Palo Alto's creative geniuses and the company's top managers.

"None of the main body of the company (Xerox) was prepared to accept the answers. There was a tremendous mismatch between the management and what the researchers were doing. These guys had never fantasized about what the future of the office was going to be. When it was presented to them they had no mechanisms for turning those ideas into real live products. You were talking to people who didn't understand the vision and yet the vision was getting created everyday within the Palo Alto Research Centre. There was no one to receive

that vision.”<sup>12</sup>

So during market development we make sure of alignment and capability throughout our organization by organizing our work around what our customers really want, and helping them to understand how our offers could meet needs. The key outputs of market development are a prepared marketplace and a message that fits it.

Some market development resources I have found helpful:

- David Aaker. *Brand Leadership*. Free Press, 2000.
- Margaret Mark and Carol S. Pearson. *The Hero and the Outlaw*. McGraw Hill, 2001. (This one is very good.)
- Geoffrey Moore. *Crossing the Chasm*. Harper Perennial, 1991, 1999.
- Al Ries and Laura Ries. *The 22 Immutable Laws of Branding*. Harper Business, 1998.

## step 7 selling

It's likely been a long journey, but now the financial return from the entire process comes through the successful sales of the new products and services. Or in the case of process improvement innovations directed internally, we now reap the benefit of increased efficiency and productivity.

We improve our brand and our build reputation as customers appreciate and admire the value that we offer. They tell their friends. We grow. We're very pleased with our successes.

But we don't stop there. Tomorrow we have to do it again because competitors are still after our market share.

Useful books on selling are harder to find, as most of the titles in this genre are not strategic in nature, but rather deal with problem of motivating the sales force, which is a constant challenge due to the amount of rejection that they must endure. One book that I do find useful is:

- Harry Beckwith. *Selling the Invisible*. Warner Business Books, 1997.  
(Technically this is actually a marketing book, but it also has a lot to say about how to organize the sales effort.)

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<sup>12</sup> <http://design.osu.edu/carlson/history/lesson16c.html>  
The parent web site, compiled by Wayne Carlson at Ohio State University, is a tremendous reference site for the history and future of the computer.  
<http://design.osu.edu/carlson/history/lessons.html>,

## taking action

### designing and implementing your innovation process

I've already discussed the inherent problems of language, of words on paper and visual diagrams, and the description of a process shown in 7 steps. This may unfortunately reinforce the illusion that it's a linear and sequential process.

But you know that new awarenesses, inputs or creations that occur in any step of the process could well impact how we think during any other step. Hence, we may make new discoveries, important ones, during the stage labeled "research" that could have fundamental impact on "strategy" or on "market development," or indeed on any other part of the process, and on aspects of our business that may not be involved in the innovation process at all. Most importantly, perhaps, what we learn in "sales" could and should significantly influence each of the preceding steps.

So while it's easy to visualize these seven steps as a sequence from 1 to 7, especially since that's how I wrote it, it would be a mistake to think of it rigidly this way.

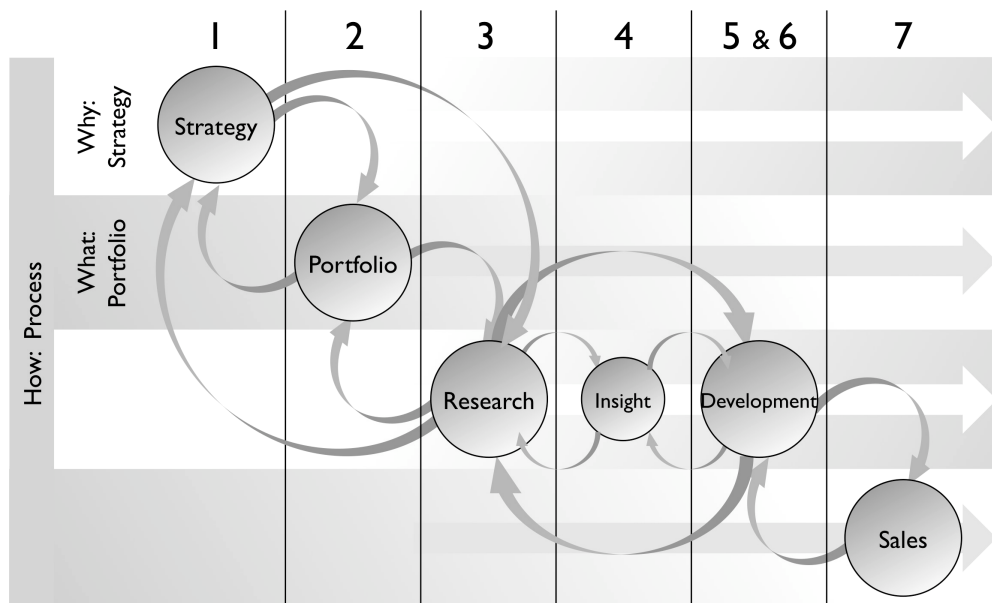


Figure 20

The Innovation Process

The looping arrows indicate feed forward loops to help people working downstream to anticipate change, and feedback loops from outputs back to inputs, representing lessons learned now applied to improving results. The arrows are more symbolic than realistic, as there will ideally be continual interaction between people working in various steps of the innovation process as they learn and share with others. Although the sequence of steps from 1 to 7 suggests that the innovation process is linear, the arrows moving from left to right indicate that all aspects of the process actually occur in parallel as multiple projects progress simultaneously.

And yet despite these limitations, in some respects it does indeed make sense to think about the process in a linear fashion because that's how projects have to be managed. They're born in strategic discussions, organized in portfolios, examined

through research, initiated by the ideation phase, and continue through the subsequent steps until there is some form of conclusion and validation and economic return, or when they are abandoned.

The map can therefore be a useful, indeed essential tool for managers, and throughout this work we have to maintain both concepts in our minds, the non-linearity of a robust thinking and learning process, and the linearity of well-run project management process that is one and the same.

The capacity to simultaneously hold two different images of the very same process is characteristic of the innovation process itself, as we must continue to hold differing, and perhaps even conflicting interpretations of new and emerging data, information, and concepts until we gain sufficient knowledge to be sure of the most effective interpretations. We will be obliged to hold two, or perhaps many possible interpretations in our minds until we know, and that may take quite some time.

Indeed, it's one of the characteristics of good and great organizations that this sort of ambiguity-laden learning happens at all. Conversely, it's a debilitating defect of those that don't succeed that we would call a learning-impairment. Developing the capability to learn is a key topic of the next chapter, which focuses on the people and developing their skills, which is integral to the innovation culture that they are building together.

## the last word...

### input, process, and output

If we look across the seven steps of the model it's clear that there are three distinct segments.

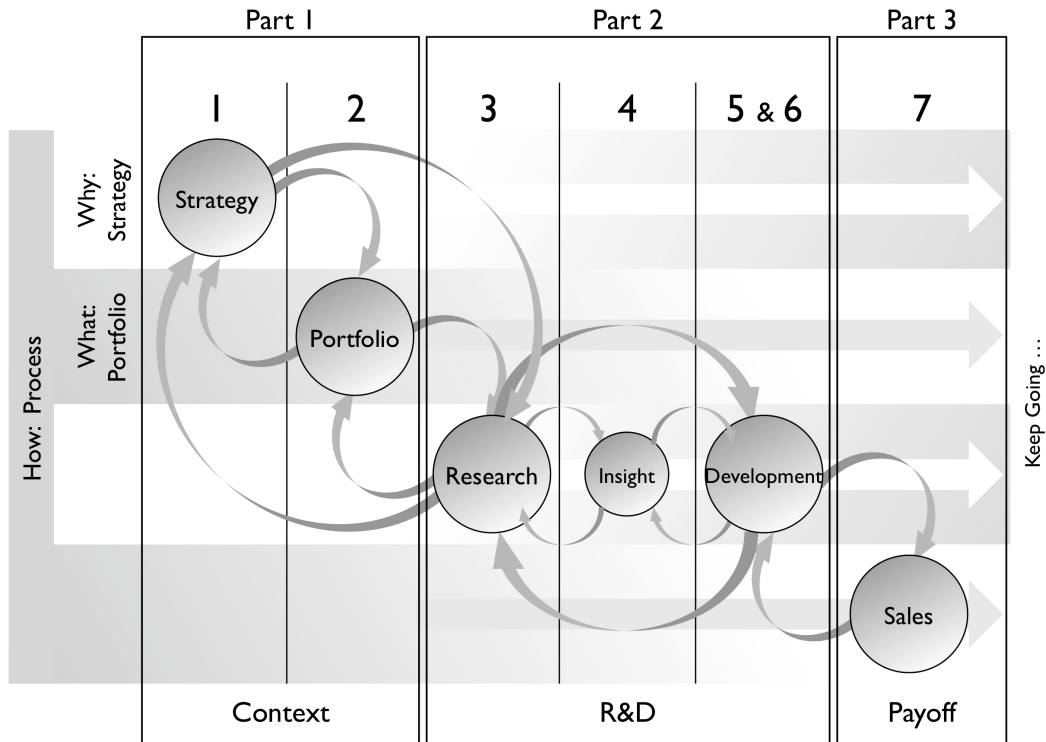


Figure 21

Three Parts in the Innovation Process  
Context (input), R&D (process), and the Sales Payoff (output)

Part 1, Steps 1 and 2 define the context through the design of Strategy and the ideal Portfolio, and the definition of Metrics. These Inputs define the scope, outlines, and structures for the innovation effort.

Part 2, Steps 3 - 6 is the heart of the Innovation Process as it is classically understood, which includes Research (Needfinding, Modeling, Ideation, and Prototyping), leading to Insight, and then to Innovation Development and Market Development.

Part 3 is the economic payoff as output, Sales, where the innovation process earns economic value for the organizations that create and manage them.

### ... and managing the process

At some point you'll be thinking about who ought to be managing the innovation



process, and the answers will depend somewhat on the type of organization. It will also depend on if there is an R&D department or not, whether there is a Chief Innovation Officer or not, the scope of the innovation portfolio and the amount of capital at risk, and the rate of change that the organization has designed its portfolio to meet.

Some of these questions will be discussed in Chapter 7, when we explore the innovation culture and the essential roles that have to be played to evoke innovative behaviors across the entire firm. One of the roles we'll discuss in detail is that of the Innovation Champion, who takes day to day responsibility for shepherding innovation projects and coaching innovative thinkers to turn their ideas into useful and valuable projects that will benefit the organization.

To support the efforts of effective and proactive managers, we also recognize that it's not possible to actually manage a process that you cannot or do not measure, which means that as a disciplined business process innovation has to be measured. So now that we have a model of the innovation process itself we can talk about how to measure the results in each of the steps. This rather large topic is the subject of the discussion that follows in the next chapter.

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Please return to [InnovationManagement.se](http://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](http://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](http://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 21<sup>st</sup> 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.”

John Holmes

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