Peter J. Denning

The Profession of IT
The Idea Idea

What if practices rather than ideas are the main source of innovation?

IDEAS PERVADE OUR professional work. We borrow them, we apply them, we solve problems with them, we create new ones, and we try to foster more of them in our teams. We express what we are doing by referring to the ideas behind our work. We hope that some of our ideas become innovations by being adopted.

We also believe that ideas launch innovations and that innovations fail for want of good ideas. As soon as we become aware of a successful innovation, we automatically look backward to try to understand where the idea for it originated. When we see failures, we immediately look to beef up our processes for stimulating imagination and creativity.

For several years I have been puzzling over why it seems that our innovation adoption rates are low even though our idea production rates are high. The overall success rate of innovation initiatives in business is around 4%.[2] Yet many businesses report they have too many ideas and waste precious time and resources struggling to select the ones most likely to succeed and then work them through to adoption.[1] We are idea rich, selection baffled, and adoption poor.

I have come to wonder if the connection between ideas and adoption is much weaker than we believe. What if innovation is not ideas generated, but practices adopted? What if entrepreneurs, rather than inventors, are the real innovators?

I do not pretend to have any sort of final answer to these questions. I would love to see them discussed and debated. Yes-answers would have important

> **An idea that changes no one's behavior is only an invention, not an innovation.**

impacts on our professional work. For example, we would worry less about stimulating creativity and imagination, and more about developing our skills at getting our communities to adopt new practices. We would approach design not as an expression of ideas but as the framework for new practices.

My objective in this column is to examine the ways in which ideas and practices source innovation. I will propose a position about these hypotheses, and I will draw conclusions about our professional work.

How Does It Work—Getting Ideas Adopted?

In discussing innovations we talk about two distinct aspects: ideas and change of practice. We often connect the two with the word "adoption"—for example, when we get an idea adopted into practice.

Research is often seen as a major source of ideas and, by implication, of innovation. Dennis Tsichritizis (then the chairman of GMD in Germany) wrote in 1997 that he thought the notion of research being the source is mistaken.[5] He noted four ways in which new practices can be adopted:

▸ Disseminate research: publicize the idea and exhort people to practice it;
▸ Create tools: build and distribute easy tools that draw people into the practice;
▸ Education and training: directly teach people the new practice; and
▸ Business: start new businesses to offer the new practice.

Only the first of these is explicitly concerned with generating ideas. The others, which occupy much more attention and budgets, can succeed without telling any of the adopters what ideas are behind the new practice.

So are ideas as important in the generation of innovations as we seem to think? How should we divide our effort between generating ideas and working for adoption?

If you think ideas are the key to innovation, you will put your effort into generating, analyzing, selecting, and publicizing ideas through papers, articles, books, blogs, and other venues. This accounts for proposals to improve creativity, imagination, borrowing, and recombination—all well-researched idea generators.

On the other hand, if you think adopting new practice is the key to innovation, you will put your effort into selling people on the value of doing the new practice, building credibility that it works, teaching people how to do it, furnishing tools to help them do it, providing leadership, helping people past obstacles and resistances they encounter while trying to do it, and building and executing on teams to get it done.

Bob Metcalfe, the inventor of Ethernet, calls these cases respectively the flowers and the weeds.[3] He says the el-

egant and alluring conceptual model and mathematical analysis published in 1976 is the flower of Ethernet;[4] but he spent 10 years "in the weeds" selling Ethernets to skeptical business leaders. His effort on the weeds far outweighed his effort on the flowers. Ethernet began as an idea but Metcalfe's deep conviction that Ethernet would bring value was the real driver that kept him going him through the long work of adoption.

Let's take a look at the case for each approach.

The Case for Ideas First

Many theories of innovation concentrate on how ideas flow from sources to products and services in the marketplace. They tell us we will get more innovation by stimulating more idea generation. They are accompanied by fascinating stories of how ideas were discovered.
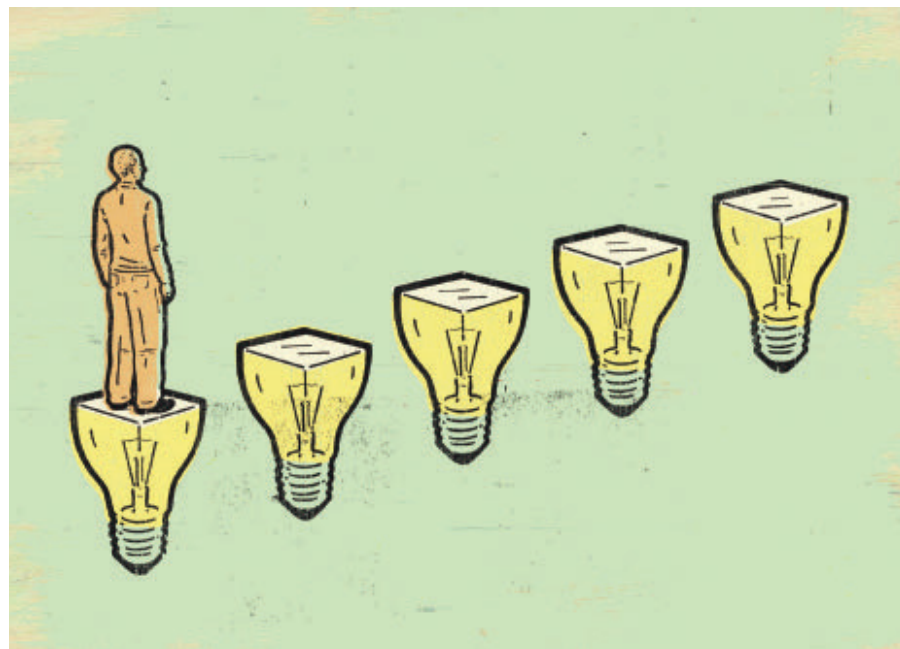
The idea idea has an attractive logic. Many innovations clearly start with someone's idea (vision). If we trace back from an innovation, we can almost always find someone who mentioned the idea first. Even if the idea inventor did not participate in the work of adoption, that person often gets credit for launching the process of refining and developing the idea as it moves toward adoption.

The popular notion of "meritocracy of ideas" supports this theory. It says that innovation is the process of the best ideas winning in a competition with many ideas.

Perhaps the most popular conception of idea-source innovation is the pipeline model. According to this model, ideas invented by researchers and visionaries flow through a pipeline with stages for prototyping, product development, manufacturing, and marketing en route to becoming products or services in the marketplace. The flow in the pipeline is driven by economic pull from the marketplace and proactive push from promoters and investors. This conception was made popular by Vannevar Bush, who, as the first U.S. presidential science advisor in 1945, laid out a plan for government sponsorship of research that was eventually implemented as the National Science Foundation. Bush thought idea generation is the main driver of inno-

vation and should be encouraged and supported by government policy. The same notion pervades the organization of many businesses—separate divisions for research, development, manufacturing, and marketing. However, many businesses today try to overcome the pipeline's inefficien-

cies with cross-function teams and with SCRUM and agile development.

Diffusion is another conception, almost as popular as the pipeline. First proposed by Everett Rogers in 1962, this model assumes that innovation is a change of a social system brought about by communicating the innovation idea through the normal channels of the social community, leading individual members to decide to adopt. The diffusion model does not assume a pipeline; it emphasizes the adoption decisions made by community members, and the factors that bring them to that decision. Companies that subscribe to this model organize heavily around marketing and public relations.

The diffusion and pipeline models share a common feature: they both put idea generation as the source. They differ on how the ideas move from the source to the market.

The Case for Practices First

Newer theories of innovation concentrate on adoption of new practice in a community. An idea that changes no one's behavior is only an invention, not an innovation.

The Prime Innovation Pattern, which is part of the new theory, says that innovators bring about changes of practice in their communities through five kinds of activities.[2] The innovator (1) senses a disharmony, (2) sticks with it like a puzzle until it can be articulated, (3) discovers how the current common sense of the community generates the disharmony, (4) proposes a new common sense that would resolve the disharmony, and (5) commits to a path of action that leads to that outcome. The innovator's goal is to change the community's practice from what they are already doing to something new that resolves the disharmony. The eight practices framework is the innovator's skill set for moving through this pattern.[2]

In this view, there is much more to accomplishing innovation than generating and pursuing ideas. There is a lot of work to be in touch with the deep concerns of the community, and then to guide them toward new thinking and actions.

Many innovations clearly start as practices. Someone starts doing something differently, often as an improvisation. When the new way is superior to the old, others imitate it; the practice spreads. After a while, someone builds tools to facilitate the practice and enable even more people to engage with it. People in the community experience this as responding to a need or an opportunity to make things better for others.

Many ideas are therefore afterthoughts to explain innovations that have already happened.

An example is blogging, which started spontaneously when someone started keeping a daily journal on a Web page (a Web log) in the early 1980s. Others imitated the practice and it spread. Various people created blogging software to help others publish their blogs and enable newcomers to start blogs. Still others built tracking services to help people find blogs of interest to them. Although some names have been proposed as the "first bloggers," the truth is that no one really knows who was the first and no one seems to care.

The current wave of "apps" and "app stores" fits this pattern. Steve Jobs of Apple saw an opportunity to sell small pieces of software that customize the iPhone. Many others have followed suit. App developers are a thriving and growing industry, offering over one million apps by mid-2010. Most of them are responding spontaneously to perceived consumer needs and opportunities, and are not engaging in an idea-generation process.

Only later, in moments of reflection, do spontaneous innovators try to explain the new practice. They call their explanation "the idea behind the practice," even though the doers of the practice had no such idea. Many ideas are therefore afterthoughts to explain innovations that have already happened.

A Combined Approach
When described side by side as above, we see that idea and practice are both essential. However, that does not mean ideas always come first. It is often more fruitful to experiment first with trial practices and later distill descriptions of the best practices into ideas.

Our best answer to the original question at this point is: find a balance between cultivating ideas and cultivating practices. What is a good balance?

Birkinshaw and his colleagues figure most companies are already plenty good enough at generating new ideas; they suggest the bottlenecks to adoption are elsewhere and consume as much as 95% of the work on innovation.[1] Metcalfe spent one year perfecting his idea and 10 years selling it.[3]

This makes the iceberg a useful analogy. The visible top part (approximately 10%) is analogous to the set of ideas describing an innovation. The invisible submerged part (approximately 90%) is analogous to the practices constituting the innovation. The practices keep the ideas afloat. The iceberg analogy has a ratio of idea work to adoption work close to Metcalfe's experience.

Too strict adherence to the idea side of innovation leads us to focus too much on the easiest part of the innovation process and to defer work on adoption until after the idea is perfected. This imbalance is called the Innovation Myth[2] or the Eureka Myth.[1] The imbalance leads us to underestimate the work of adoption and it compounds the selection problem. Escaping this myth will require a radical reorganization of approaches to innovation. But the escape is well worth it because it also escapes the dreadful waste of the 96% failure rate.

You can put this to work at the personal level immediately. Beware the idea idea. Put 10% of your effort into explaining the value and principles of your ideas, and 90% into fostering the new practices you advocate for your community. Get going on the work of adoption from the very beginning. **C**

References
1. Birkinshaw, J., Bouquet, C., and Barsoux, J.-L. The 5 myths of innovation. *MIT Sloan Management Review 52*, 2 (Winter 2011), 42–50.
2. Denning, P. and Dunham, R. *The Innovator's Way.* MIT Press, 2010.
3. Metcalfe, R. Invention is a flower; innovation is a weed. *MIT Technology Review* (Nov. 1999). www.technologyreview.com/web/11994/?a=f
4. Metcalfe, R. and D. Boggs. Ethernet: Distributed packet switching for local computer networks. *Commun. ACM 19*, 7 (July 1976), 395–404; http://doi.acm.org/10.1145/360248.360253
5. Tsichritzis, D. The dynamics of innovation. In *Beyond Calculation*, P. Denning and B. Metcalfe, Eds. Copernicus Books, 1997, 259–265.

Peter J. Denning (pjd@nps.edu) is Distinguished Professor of Computer Science and Director of the Cebrowski Institute for information innovation at the Naval Postgraduate School in Monterey, CA, is Editor of ACM *Ubiquity*, and is a past president of ACM.