Managing False Negatives
by Henry Chesbrough

In the late 1980s, scientists for New York City–based drug-maker Pfizer began testing what was then known as compound UK-92,480 for the treatment of angina. Although UK-92,480 seemed promising in the lab and in animal tests, the compound showed little benefit in clinical trials in humans.

Looking at these negative results, some firms might have thrown in the towel and moved on to other projects. But Pfizer’s scientists picked up on—and decided to pursue—what they thought might be an interesting side effect. That side effect led the process of innovation in an entirely new direction—one that eventually resulted in a historic windfall for the drug maker soon after it began marketing UK-92,480 under the brand name Viagra.

Pfizer was able to develop and launch a wildly successful and profitable new drug because it effectively managed the false negatives—ultimately incorrect indications of failure—of the innovation process. Firm scientists were able to see beyond the drug’s initial lack of success in treating hypertension, and, in doing so, they rescued UK-92,480 from the scrap heap of failed innovation and put it on the road to becoming one of the biggest drug introductions in history.

Although smart organizations have traditionally taken care to minimize the false positives of innovation, they have much more rarely considered the false negatives. This is because the damage created by false positives is much easier to recognize and quantify. False negatives are not only difficult to recognize, but there is also no single, surefire way to deal with them. Nevertheless, companies can implement the following practices to spot them and manage them.

**REVIEW ALL CANCELED PROJECTS**
An effective starting point is to review all canceled projects a second time six to 12 months after they have been terminated. Has anything changed, either within the project itself or within the larger environment, that might warrant reconsideration of the earlier decision?

**EXPOSE PROJECTS TO OUTSIDERS**
If a project isn’t moving ahead inside the company, maybe someone outside the company can think of something to do with it.

IBM took an approach along these lines with a particular software project that had been kicking around in its labs for some time but did not seem to have any potential. Once the project was sidelined, IBM decided to publish it on its AlphaWorks Web site, where outsiders could examine and download various IBM software. Soon thereafter, IBM managers noticed that this particular piece of software code was being downloaded at a rate 10 times that of other code posted at the site. To IBM’s credit, this surprising level of external interest triggered an internal reconsideration of the software code. We know it today as the XML (Extensible Markup Language) parser.

**SEEK EXTERNAL LICENSES**
Through external licensing, projects that aren’t being used internally might unlock additional revenues on the outside. Procter & Gamble follows this path as part of its “Connect and Develop” strategy. According to P&G policy, any technology that is not being used by one of its businesses within three years of its patent date is automatically made available for license to others—including competitors.

This may have an additional side benefit: P&G businesses now know that if they don’t use a technology, they might lose it to a competitor instead. This likely forces a more careful consideration of new P&G technologies when they become available.

**SPIN TECHNOLOGIES OFF**
Lucent Technologies—now Alcatel-Lucent—created its
New Ventures Group (NVG) to launch new ventures that would commercialize technologies judged not to be valuable internally within Bell Labs. The NVG team looked for promising technologies that weren’t getting to market through Lucent’s own businesses. When they identified one, they first offered it back to Lucent’s businesses. Only those projects turned down by the businesses were then pursued as new ventures.

Lucent’s businesses had to make their decisions carefully, because if they didn’t choose to use a technology, they might lose it to a new venture. NVG initiated 35 ventures out of Bell Labs from 1996 through 2001. Many of these went out of business, a few became valuable, and three of them were later reacquired by Lucent, just two or three years after the Lucent business had chosen not to pursue the technology internally.

How did Lucent businesses miss the value of these technologies? It was not an error in judgment by the businesses, in my view. Instead, it was a measurement error, resulting from the inevitable uncertainties of assessing early-stage technologies.

Nevertheless, having three out of 35 projects turn out to be “positives” is not a bad track record for Lucent’s businesses. If Lucent had not had NVG as part of its process, though, the information created by these ventures once they got started would never have emerged. These projects might have remained buried within Bell Labs indefinitely.

**SEEK EXTERNAL VC PARTNERS**

Venture capitalists offer another interesting option for ideas that have been rejected internally. VCs are adept at crafting business models for emerging technologies, and they can experiment with nascent technologies in emerging markets far more effectively than can most large organizations.

This approach also offers several options for the company that originated the idea: it can participate as an investor, as a customer, as a supplier, or simply as an interested bystander. If and when some real value is created, the company can step in by licensing the technology or acquiring the new venture company.

**IF YOU CAN’T PREDICT, LEARN HOW TO REACT**

When commercializing a new technology requires the resolution of both technical and market uncertainty, one cannot expect to be able to anticipate the best path forward from the very beginning. You simply don’t know all the possibilities in advance. Not only are they unknown, they are unknowable.

No amount of planning and research can reveal the facts because they simply don’t exist yet. And measurement errors are inescapable in such situations. Rather than ignoring them, companies should initiate processes to cope with these errors. This increases their chances of finding a highly valued use for the technology.

The history of innovation is full of examples where the eventual best use of a new product or technology was far different from its initial intended purpose. Companies need to manage false negatives in their innovation processes and respond accordingly.

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**THE HIDDEN VALUE OF FALSE NEGATIVES**

By their very nature, false negatives are tricky to spot in advance. Xerox created a number of false negatives out of its Palo Alto Research Center lab. When it didn’t see the results it sought, Xerox terminated further funding for projects that we know today as Ethernet (by 3Com) and PostScript (by Adobe).

These projects were evaluated within Xerox and judged not to warrant further internal spending because the company didn’t see a market for the technology. It also lacked the necessary practices for recognizing and coping with false negatives. Of the rejected projects that started inside Xerox’s labs from 1979 through 1998, 11 of 35 were spun out to the external environment with no Xerox involvement and eventually became very valuable.

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