

Innovation

Why Bad Things Happen To Good Technology

New ideas take you only so far. Firms also need to innovate their business models.

By **HENRY CHESBROUGH**

April 28, 2007; Page R11

In most companies, innovation is the responsibility of the technical side of the organization. The research and development staff is supposed to come up with the cool new technologies, and the rest of the company takes them to market.

But that model doesn't assure success, as the recent history of innovation shows. Betamax lost out to VHS. Macintosh, to a lesser degree, lost out to Windows. We still use color-TV standards from the 1940s, despite many initiatives to improve picture quality.

Put simply, bad things can happen to good technology. And much of what can happen is due to the business model the company uses to commercialize the technology. This is the next wave in innovation: to innovate the business model that commercializes promising new ideas and technologies. Doing so is, for the most part, a simple process of trial and error. But at most companies it also requires the removal of some barriers to such innovation.

Embracing Change

What are those barriers? Perhaps the most basic is simply this: Companies get trapped by their own success. Once a company's business model has proved effective, the tendency is to seek out additional opportunities that fit that model -- and to play down any technologies that don't fit that model.

For example, a company that is accustomed to a business model based on charging money for products might overlook a technology that works best with a model based on free distribution with an advertising mechanism to produce revenue.

[International Business Machines](#) Corp. is one example of a highly successful company that saw the need for innovation in its business model and reinvented itself to great effect. By experimenting with new approaches, the company evolved from a model of vertical integration of its own proprietary products and services to a much more open model that includes cooperation with other companies in developing and commercializing technologies.

In the 1960s and 1970s, IBM was regarded much as Microsoft Corp. is regarded today: a

very large, enormously successful, extremely well managed company, that effectively was a near monopoly. But by January of 1993, the company was in need of a new approach. That month, IBM announced what was then the largest loss in U.S. corporate history, \$5 billion for 1992, along with the latest in a string of layoffs. Soon after that announcement, IBM fired its chief executive officer and brought in the first outside CEO the company had ever had in its history, Lou Gerstner. IBM's business-model innovation was born out of this financial crisis.

Cutting Down, Building Up

Mr. Gerstner's arrival at IBM led to significant cost-cutting and a final round of layoffs. But this by itself isn't business-model innovation. Where that began was through a fervent hunt for new revenue sources.

One experiment was to offer IBM's semiconductor lines to act as a foundry for other companies' products. This brought in new revenue and increased the utilization rate of IBM's equipment and facilities. A related experiment was to create a research alliance to share the high costs and significant risks of pioneering leading-edge semiconductor processes.

IBM's need to generate greater profits also led it to rethink its whole approach to managing its patents and technology. The company was able to raise hundreds of millions of dollars a year by licensing its intellectual property.

These initiatives and other experiments in open-source software and information-technology services have transformed IBM's business model. More than half of the company's \$90 billion revenue in 2005 came from its IBM Global Services arm, a business that didn't exist 15 years earlier.

Ideally, of course, a company will figure out how to innovate its business model before it is compelled to act by financial stresses. But innovating without that motivation can be difficult.

One problem is an organizational gap in most companies: Who is responsible for business-model innovation? It can't be left to the chief technology officer and his or her staff alone; business-model innovation clearly requires leadership from the business side of the organization. Yet who within the company short of the CEO is responsible for the way the business creates value in its products and services and captures that value in the form of revenue from its customers?

Certainly the chief financial officer needs to be involved, both for measuring accurately the results of the model and for communicating these results to outside investors. The marketing leadership focuses on brand development and channels of distribution. The chief legal officer has a role to play, particularly when intellectual property is an important contributor to the ability to capture value from the model. But no one of these

people has the ability to drive the entire business.

Running the Status Quo

In some businesses, a general manager or division president may have complete responsibility for the financial performance of a business unit. Even here, though, there often are sharp limits to the ability of these managers to innovate their business models. Some companies, for instance, put their general managers through two-year to three-year rotations running specific businesses, increasing the size of the businesses the managers run over time. This is too short a time frame to create new business models. It takes more time than that to develop business-model experiments, obtain clear results, interpret and understand the results, and then carry out a broad deployment of those results.

Little wonder, then, that most general managers simply stay with the current business model, and show top management their ability to grow the business within the constraints of that model. In turn, the CEO typically delegates responsibility for the business model to the general manager of the business unit.

The result is that the business model becomes taken for granted. So companies that spend enormous amounts of money on developing advanced research and technology often lack processes to innovate their business models in a way that might dramatically increase the return on that R&D investment.

Ideally, an organization will give a senior manager the resources and authority to define and launch business-model experiments. This will require cooperation from many other parts of the organization. Once the data from these experiments are received, that senior executive can decide which experiments to continue, which new ones to initiate, and whether and when enough information exists to justify the wider adoption of a new business model.

[Air Products & Chemicals](#) Inc. has created a series of teams for managing the intellectual assets of each of its businesses, a system that helps ensure that the company's new business model stays flexible.

The company has shifted from a purely independent business model to one where it also commercializes new technologies in partnership with other companies. One example of this is the company's approach to nanotechnology. Air Products has developed some new ways to manipulate nano-scale particles for use in various materials, including those used in coatings, adhesives, inks and semiconductors. Among its partners in commercializing these products are [DuPont](#) Co. and [Nanogate](#) AG. Air Products also licenses some of its technologies to other companies.

To manage all this, Air Products created teams for each of its divisions that are free to determine what technologies have the most potential value, regardless of whether those would be used inside Air Products or licensed to others. As Jeff Orens, of the Advanced Materials Intellectual Asset Management Team, says, "What I tell our scientists is that

what we are protecting is not you, or even your invention. What we are protecting is the business model."

The result of Air Products' new approach is that the company is getting more innovation done with its internal R&D resources by leveraging external R&D. And capital expenditures are down, as partners invest alongside Air Products in business initiatives. So the company is enjoying more growth without increasing R&D expenses and without increasing capital spending.

Eye on the Competition

Established companies also need to pay close attention to the models used by younger, rapidly growing businesses in their industry, including well-funded start-ups. These new ventures seldom replicate the business model of the established firms. Instead, they attempt to compete with a different kind of business model.

Consider how [Southwest Airlines](#) Co. entered and expanded in the U.S. domestic airline market. While it flew the same kinds of planes, it altered many other aspects of the standard airline business model: from the customers it targeted, to the routes that it flew, to its pricing, to the way seats were assigned on its planes. It is best for industry leaders to identify these innovative business models early, so that they can develop a deep understanding of how they work while they are still young. That gives the established companies more time to figure out how best to adapt to this new kind of business model.

Companies also need ways to protect their business-model experiments internally -- so that they don't directly compete with the mainstream initiatives within the company. One way to do this is by funding these experiments with a separate pool of money set aside specifically for this purpose, to keep these projects from being perceived as taking money away from more-mainstream projects.

Once a new business model demonstrates real potential, the company needs to deploy that model more widely. This is another stage of testing: Can the new business model work at higher volume and greater scale of operation? If it can, its expansion increases the competition for resources between the new model and the established model (which, remember, has been proved successful over many years, and often the top executives of the company owe their career success to the current model). While the competition between the two models can no longer be avoided at this stage, it can and must be managed. Each model deserves a chance to demonstrate its continued viability. Customers will ultimately be the final arbiter of whether one is better than the other.

In many cases, though, there may be market segments in which each works well, and thus they can co-exist. At [Barnes & Noble](#) Inc. booksellers, for example, it is now clear that many of the company's customers prefer to buy books online, while other customers prefer to go to their local B&N bookstore, peruse the shelves, and purchase their books at the register. B&N now employs both business models as valuable ways to serve its

market.

There is no way to know today exactly what any company's future business model will look like. The only way forward is to conduct some experiments, gather the evidence, identify the most promising direction and then run some further experiments.

Business-model innovation is risky, to be sure, but the rewards are well worth it. Just imagine what IBM would look like today if it hadn't innovated its business model.

--Mr. Chesbrough is the executive director of the Center for Open Innovation at the Haas School of Business at the University of California, Berkeley. He can be reached at reports@wsj.com.

FOR FURTHER READING

These related articles from MIT Sloan Management Review can be accessed online

- **The Era of Open Innovation**

By Henry W. Chesbrough (Spring 2003 issue)

In the new logic of open innovation, the role of R&D extends far beyond the boundaries of the enterprise.

<http://sloanreview.mit.edu/smr/issue/2003/spring/5/>