strategy+business

Bridging the Breakthrough Gap

For further information:
editors@strategy-business.com
Booz & Company

from **strategy+business** issue 37, Winter 2004

reprint number 04402

booz&co.

Reprint

Bridging the Breakthrough Gap

Creating disruptions is fine, but mending them may be even better. The case for cautious inventiveness.

by Nicholas G. Carr

For most of human history, long-distance communication was a cumbersome affair. Documents had to be carried on foot or horseback, or in the holds of ships, and they often took weeks or months to arrive at their destination. Then, in 1835, a New York University professor and artist named Samuel F.B. Morse invented the telegraph, and the world changed. Suddenly, it was possible to send messages down wires and cables, instantaneously connecting people and businesses in different countries or on different continents.

The rise of the telegraph system was far from seamless, however. The infrastructure took many years to be installed, and users often had to struggle with gaps in the network. One of the most maddening of those gaps lay in the heart of Europe. The Belgian line terminated in Brussels, and the German line went only as far as Aachen. Messages had to be transcribed and carried over land across the 77 miles separating the two cities. But one small company saw a business opportunity in this problem. In 1849, it bought a flock of carrier pigeons and used them to fly messages between Brussels and Aachen, dramatically reducing transit times. Within a few years, the company had grown to become one of the leading telegraph agencies, specializing in the communication of time-sensitive financial information. Its name was Reuters.

There's an important lesson in this story: When a disruptive new technology arrives, the greatest business opportunities often lie not in creating the disruption but in mending it — in figuring out, as Paul Julius Reuter did, a way to use an older, established technology as a bridge to carry customers to the benefits of the emerging technology.

When we talk about business innovation today, we tend to use terms like *breakthrough* and *pioneering* and *revolutionary*. But some of the greatest and most lucrative innovations are essentially conservative. They are brought to market by companies that are as adept at looking backward as looking forward, and that have the skill and patience to achieve the most commercially attractive balance between the old

Illustration by Lars Leetaru

and the new. "Conservative innovation" may sound like an oxymoron, but it's an idea that deserves to be a part of every company's thinking.

Late Adopters

Some new technologies find commercial success rapidly. It wasn't long after the invention of nylon in 1938 that the cheap, supple plastic supplanted silk as the fabric of choice for women's stockings. In most cases, though, new technologies take hold slowly, advancing through a long series of technical and market barriers. The automatic telephone switch was invented by the end of the 19th century, but manual exchanges continued to be widely used for another 50 years. Facsimile transmission also became possible in the late 1800s, but it took a century for it to become commonplace. Consumer PCs were introduced in 1975, but even in 2000 only half of U.S. households owned one.

The "future," in other words, arrives in fits and starts. There are several reasons. A new technology may be difficult to use, requiring specialized expertise. Or it may be plagued by bugs that reduce its utility. In the early days of railroads, trains had the annoying habit of going off the rails; it was only after wheels, couplings, and tracks had advanced and become standardized that train transport became reliable enough to be broadly adopted. Or, as with the telegraph, a new technology may involve the building of a physical infrastructure, requiring a lot of money and time.

Sometimes progress goes slowly not because of flaws or shortcomings in the technology, but because consumers resist its adoption. Early versions of new technologies are often prohibitively expensive, and that can restrict their use to a small slice of the market for many years. In other cases, buying a new technology requires abandoning an old and familiar one, something consumers are rarely eager to do. Years after color televisions had been introduced, many people happily continued to use their old black-and-white television sets. Mobile telephony was embraced relatively slowly in the United States because the country's landline network was so reliable and ubiquitous. Who needed a cell phone?

Companies don't always see these roadblocks clearly. As Costas Markides and Paul Geroski of the London Business School have noted, business innovation often is spearheaded by enthusiasts — engineers, product developers, marketers, entrepreneurs — who tend to be much more enamored of new technologies than are run-of-the-mill consumers. (See "Colonizers and Consolidators: The Two Cultures of Corporate Strategy," by Costas Markides and Paul Geroski, *s+b*, Fall 2003.) It's natural for corporate innovators to overlook, or give short shrift to, the many potential barriers that can hold up progress. Their desire to be pioneers — to do cool things fast — blinds them to the more mundane realities of the marketplace. As a result, companies can easily fall into a trap: They can get far out ahead of customers in the adoption of a new technology. They can rush headlong into the future only to find that no market yet exists.

We've seen this phenomenon recently, and repeatedly, with the Internet. A good number of dot-coms failed not because they had the wrong technological vision but

Nicholas G. Carr (ncarr@mac.com), a contributing editor to *strategy+business*, is the author of *Does IT Matter? Information Technology and the Corrosion of Competitive Advantage* (Harvard Business School Press, 2004).

because they arrived on the scene far too early, with too much money and too little patience. Nowhere was this flaw so pronounced as in the realm of new media. In the late 1990s, a slew of well-funded startups began streaming video over the Web. With funky names like Icebox.com and a roar of buzz behind them, these companies were going to become the great new broadcasters of the future.

It didn't happen, of course, and in retrospect it's easy to see why. The success of their services required a large pool of customers with the kind of reliable, high-speed Internet connections needed to watch video. Yet even as late as 2000 — well into the so-called Internet Age — only a tiny fraction of the U.S. population had broadband connections at home. Among the minority of households that had any Internet service whatsoever, 92 percent were using dial-up modems, and of that group 40 percent were using outdated modems operating at 33.6 Kbps or slower. The Internet broadcasters had outinnovated the market.

Even today, considerably less than half of all U.S. households have broadband Internet access. Nearly all the common barriers to rapid technological advance are in evidence here. For many households, it's a matter of technology — their phone and cable lines have yet to be upgraded to accommodate high-speed data transmission. For others, it's a matter of economics — they can't afford the higher cost of broadband subscriptions. And for still others, it's a simple matter of desire. These people connect to the Internet only occasionally — to check their e-mail, for instance — and they don't feel any pressing need to upgrade.

Conservative Innovation

But even in the face of the slow spread of broadband connections, one company has found success in running an Internet-based video business. Its name is Netflix, and its secret is conservative innovation. Like Reuters with its pigeons, Netflix uses an old technology (the U.S. mail) to deliver DVDs of movies ordered through a new technology (the Internet). Through a fairly simple Web interface, it provides a sophisticated database and ordering system easily available to virtually all Internet users, whether they have broadband or narrowband connections. But instead of trying to get customers to download enormous files, it simply delivers physical media to their mailboxes, often the day after they place their orders. With a business model that's half Amazon.com and half Blockbuster, Netflix has struck a balance between an old and a new technology that is in tune with the current needs of the market. Its challenge now is to build on its customer relationships and brand strength to remain successful as Internet and video technologies continue to advance — and as other companies, including behemoths like Wal-Mart, try to mimic its simple business model.

Netflix's business model — half Amazon, half Blockbuster — balances old and new technology.

There's another common barrier to technological advance: a lack of what economists call complements. It took more than Henry Ford and his assembly line, for example, to make the automobile a mass-market product. Critical complements, such as highways and gas stations, had to be built as well. Even after a new technology is well established, its spread is often hampered by the slow development of necessary complements.

The next great shift in automotive technology — from gasoline to hydrogen power — promises again to be held up by the absence of complements, in particular the lack of a broad distribution system for hydrogen. For hydrogen-fueled cars to appeal to a large set of buyers, hydrogen stations will need to become as commonplace as gas stations are today.

The complexities inherent in the shift to this new motive technology present a major challenge to carmakers, and it's instructive to look at the very different approaches being taken by two of the largest of them, General Motors and Toyota.

All the major automobile manufacturers know that they will need to move away from gasoline-fueled vehicles. Growing environmental and political pressures to reduce the use of petroleum will be impossible to resist. GM has taken the technological lead in the race to a new generation of clean automobiles, investing heavily in perfecting the hydrogen fuel cell as a replacement for the internal combustion engine. GM has announced that it plans to introduce hydrogen-fired passenger cars by 2010. Many experts, however, believe that GM is overoptimistic. They predict that, even if the basic technology is refined by

then, it will take much longer to roll out the complements required for hydrogen cars to be attractive to drivers.

In the meantime, Toyota is taking a very different course. Rather than focus on pioneering the next great technological advance, it has positioned itself as a conservative innovator, creating a hybrid car that combines an old automotive technology (the internal combustion engine) with a new one (the electric engine) in a way that provides near-term market opportunities. The products of its strategy, the popular Prius and other forthcoming hybrid models, use some of the power produced by their gasoline engines to recharge their batteries. They're able to reduce emissions and increase fuel efficiency by shifting from gas to electric power whenever possible.

Because they use gas rather than hydrogen, the hybrids do not require either the fine-tuning of a radically new technology or the emergence of a new set of complements to support them. Average people can drive hybrids immediately without having to change any of their habits. The Prius may not be as "green" as hydrogen cars promise to be, but it is considerably cleaner than traditional cars — and environmentally minded consumers don't have to wait another decade to buy one. Today, the Prius moves off dealers' lots faster than any other car model in the world, a distinction it has maintained almost since its U.S. debut in 2000.

It's been said that, because of high manufacturing costs, the Prius is not yet profitable. But that argument misses the larger point. As Toyota has gained experience in building hybrids, manufacturing expenses have fallen steadily, and at the same time the company has created a strong brand and a large and loyal clientele. When the shift to hydrogen cars finally arrives, it will have already established a dominant presence in the market for clean vehicles as well as a store of practical knowledge about the products and their buyers.

GM, meanwhile, is also spending heavily to create its technological breakthrough, but it's not pulling in any revenues to defray those costs. It's probably no surprise that the company recently backed away from its single-minded commitment to hydrogen power, announcing that it would begin to offer hybrid models even as it continues its work in pioneering the new technology. Belatedly, GM is joining the ranks of the conservative innovators.

A Third Way

Research by business scholars has shown that, when it comes to major innovations, the first movers rarely find the greatest success. They're usually outmaneuvered by the copycats — the companies that follow in the innovators' footsteps but end up dominating the market because of their stronger managerial and marketing skills.

Conservative innovation follows a different path, a third way. Conservative innovators neither pioneer a new technology nor copy it. Rather, they combine it with an older technology to create a different sort of product altogether. And, often, it's exactly the product that today's customers actually need, want, and are willing to pay for. ✚

Reprint No. 04402

strategy+business magazine
is published by Booz & Company Inc.
To subscribe, visit www.strategy-business.com
or call 1-877-829-9108.

For more information about Booz & Company,
visit www.booz.com

Originally published as "Bridging the
Breakthrough Gap" by Nicholas G. Carr.

booz&co.