



## The Upgraded Digital Divide: Are We Developing New Technologies Faster than Consumers Can Use Them?

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TiVos and Treos and BlackBerrys. Wi-Fi and HDTV and plasma screens. Picture phones, digital cameras, iPods and now iPod cell phones. Using sophisticated products and keeping pace with their new features requires significant time, interest and a certain amount of smarts on the part of consumers. It also takes a lot of energy to sort out the bells and whistles you really need from those you sort-of need and those you don't need at all.



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Complexity among consumer technology products has never been greater -- a good thing if the complexity means product improvement. But Wharton experts say new bells and whistles pose challenges to businesses and consumers alike. Complexity -- along with choice -- can have a big impact on how firms make and market new and improved gizmos, and on the decision processes of the people expected to buy them.

Companies need to spend significant resources explaining new product features to time-strapped potential customers, more than a few of whom never figured out how to program videocassette recorders 20 years ago and pine for the days when a hi-fi set was the most complex piece of technology in the house. The more savvy companies know this means beefing up their telephone, online and in-store support for new products. For their part, consumers must be able to cut through the clutter to make smart purchases. In many cases, companies are relying on the strength of their brands to steer customers toward their products and not the competition's.

Wharton marketing professor [Robert J. Meyer](#) has been studying the ramifications of product enhancement and replacement since the 1980s. In a new paper, Meyer -- along with Shenghui Zhao of Wharton and Jin Han of Singapore Management University -- discuss what they call the "paradox of enhancement" in decisions by consumers to adopt new products. The paradox is this: When people are considering buying next-generation products, they find the bells and whistles attractive and decide to make the purchase, but when they acquire the products, they find the complexity of the new features overwhelming and end up using only the products' basic features.

"At the time of purchase, people tend to focus on the positive and begin to imagine all the great uses they will get from these new features," Meyer says. "But they fail to foresee all the things that will cause them not to use them, such as the difficulty of learning."

### Accentuating the Positive

Customers tend to accentuate the positive even in the face of past experience: They are aware that, in the past, they bought products and did not use their new features; nonetheless, they plow ahead and buy a new gizmo loaded with bells and whistles. Or, it may be the case that people know that they have not made use of next-generation product features in the past, but convince themselves that they still might do so this time around. Meyer uses the phrase "the possibility of infinite deferral" to describe this mindset.

"Let's say the new zoom feature on your TV requires five buttons to operate," he says. "The first time you

use the remote control you push a couple of buttons and the feature doesn't work. You say, 'I'll learn to do it tomorrow.' That's what people don't anticipate when they buy products with enhancements -- the learning costs in using the enhancements and their own propensity to postpone learning."

Meyer and his fellow scholars reached their conclusions through a series of experiments involving about 150 business-school undergraduates. The students were trained to play an arcade-like computer game that offered cash rewards based on the subjects' ability to move a screen icon with a set of controls. The students were then given the opportunity to purchase, and continue playing with a new generation of the game that offered a set of expanded controls. In exchange for the augmented controls, the students were willing to pay more money than they could ever hope to recoup through higher game scores, a decision implying "excessively optimistic beliefs about the value of the additional set of controls."

Put simply, the students -- and, by extension, all consumers -- are "deluding themselves," according to Meyer, whose paper is titled "[A Tale of Two Judgments: Biases in Prior Valuation and Subsequent Utilization of Novel Technological Product Attributes.](#)"

But the enhancement paradox described in the paper -- where the augmentations are an attempt to keep certain products, like computers, from staving off *obsolescence* -- does not apply to changes made to all consumer products. In earlier research, Meyer found that when people buy new and improved products in an attempt to stave off product *deterioration*, such as washing machines, refrigerators and other items that have largely been the same for many years -- they do not feel compelled to rush out to buy the next-generation product.

"Whereas people get envious when they see that their new TV has already become obsolete, they don't feel this way when they see there are better models of washers out there. ... It's because people have it in their mindset that a perfectly functionally minimal device is fine. Anyone who has more than that is overbuying, in their view. If you have a 2000 Maytag that glows in the dark, people tend to think it's ridiculous."

Wharton marketing professor [Barbara Kahn](#) says product complexity leads many consumers to turn to others to help them make decisions -- a spouse, friend, salesperson or newspaper and magazine columnists who specialize in writing about new technologies.

"My personal feeling is if the complexity becomes difficult for me, I frequently will pass off part of my decision to some trusted adviser or rely on an expert recommendation," says Kahn. "My husband is more into this than I am. When the decision gets into making trade-offs, I want to make the decision but I may not want to spend the time [learning about the product enhancements]. When we were buying PCs in the beginning in the 1980s, it was the same situation: People wanted computers but didn't know what to buy. Everybody in the neighborhood would go to the person who was the expert."

### 'The Mossberg Factor'

Today, technology writers such as Walter Mossberg of *The Wall Street Journal* or David Pogue of *The New York Times* exert strong influence over consumers' purchasing decisions.

"The Mossberg Factor matters a lot," according to Kahn. "He's no longer Everyman because he knows much more than most people about technology. But he's the 'normal person' who tries to see from the normal person's point of view what makes sense in tech products. He gave a really big endorsement of the Treo [a personal digital assistant that, among other things, allows users to receive e-mail wirelessly and competes with the BlackBerry]. I had a BlackBerry, but I read the Mossberg column about the Treo and I'm on my second Treo."

Wharton marketing professor [Peter S. Fader](#) says smart companies are using the strength of their brands to help consumers slash their way through the jungle of product information. "If you develop a brand

that's well-liked for whatever reason, people will basically trust it. The reason for the warmth and fuzziness of brands often has nothing to do with the technical quality of a product. But branding is one way companies help consumers sort through the clutter."

Kendall Whitehouse, senior director of information technology at Wharton, agrees that brand equity can be valuable in convincing hesitant buyers to purchase a complex product. "Very often that's the deciding factor. Consumers may initially look at *Consumer Reports* and compare different products. But once that universe of information becomes too burdensome, they tend to say, 'Just give me the Sony or the Apple.' People gravitate to brands as one way to eliminate complexity of choice."

At the same time, brand images are shifting as electronics and tech companies move into each other's product lines. "When you look at high-tech products you see consumer brands moving into the computing space and computing companies moving into the consumer space," says Whitehouse. "The Sonys of the world are now computer companies. Companies like Microsoft and Apple are coming out with consumer products. And with a company like Apple, its expertise in user experience is helpful because these are the skills that give a company traction in the consumer space."

## The Geek Squad

Another way for companies to attract customers to sophisticated products is to increase their consumer-support capabilities. "You have to form relationships," Fader says. "Manufacturers do that routinely; retailers are coming around to that. Best Buy is doing a good job at this [by acquiring Geek Squad, a service that provides 24-hour computer support]. In the old days it was a matter of selling product and walking away. It was much more a product and sales mentality. Today, we are much more into relationship marketing. The value of the sale is not enough; there's also the lifetime value of customers to consider."

Fader says new, technologically innovative products -- and the follow-up innovations to those products that are added later -- typically have to make the leap from focusing on technology-literate early adopters to appealing to average users. High-tech products able to "cross the chasm" -- to use the phrase coined by author Geoffrey A. Moore in his book of that title -- become successful, some enormously so. But, as Moore points out, technology companies over the years have often gotten so caught up in technical features -- nerds designing products for nerds instead of mainstream users -- that they have had trouble crossing the chasm.

There was a time, Fader recalls, when news of new products and product enhancements took a bit of time to filter their way down to mainstream users. But today consumers often get wind of new gizmos before they are ready to understand them, which can spell trouble for themselves as well as manufacturers and retailers. Fader says consumers could do themselves a favor by ignoring new enhancements until the early adopters try them out. Companies, meanwhile, should be cautious about how they go about introducing new products.

"Before, when new technology came out, you and I wouldn't know about it," Fader explains. "Nerds would write about it in *Nerd Monthly* and only slowly would it trickle down to the mass market. But today, with the speed at which information travels, we sometimes become aware too soon. We shouldn't read about this stuff till David Pogue writes about it. Companies must be careful how they launch these things. Do they have only a few people try it out and then spread it by word of mouth? Or should they go to market quickly?"

Fader answers those questions by noting that companies have learned over time -- or should have learned -- that introducing an overly complex product too quickly can spell disappointment. "With DVRs [digital video recorders] like TiVo, designers totally forgot this lesson and tried to go mass-market way too quickly. Some people said, 'This is an amazing device.' But the vast majority of would-be buyers said, 'Huh? Who needs this?'" The manufacturers killed themselves in the process. It's just now starting to cross

over. I'm looking right now at my Comcast DVR. It's a DVR for people who didn't want to deal with the part of the chasm where the early adopters are. Our ability to develop new technologies is moving ahead of consumers' ability to enjoy them."

But things will change over time. Looking ahead, Whitehouse sees product simplicity overtaking product complexity as a key sales point for consumers. The products may actually be more sophisticated in design and in the kind of results they deliver, but they will be easier to use.

Some companies are jumping on the simplicity bandwagon. A new model of cellphone from Vodafone Group -- dubbed the Vodafone Simply -- offers meat-and-potatoes features aimed at people 40 and over who want to make calls, talk and hang up, not fiddle with cameras and browsers. As of now, it is being sold in nine countries, excluding the United States. In addition, Philips Electronics has created a Simplicity Advisory Board of experts to help it develop easy-to-use products. Enderson Guimaraes, head of global marketing management for Philips, told *The Wall Street Journal*, "Many products complicate my life instead of making it easier."

"Today we're seeing a somewhat anomalous bump in the evolution of consumer technology products," Whitehouse says. "In the early phases of that evolution, which we are still in the midst of, there was a tendency for manufacturers to add features. Greater computing power [in consumer products] lets you add more features. And as long as companies focus on differentiating their products through their features, that produces complexity. But it's a short-term trend. The very thing that causes the complexity will actually be the solution. More computing power also means you can make devices more 'intelligent' and, hence, simpler to use. Think about recording TV programs. Using a TiVo or a Windows Media Center PC is a lot easier than programming a VCR."

In addition, Whitehouse foresees increasing standardization of user interfaces among tech products. Think about driving a car. There are many makes and models of cars, with a variety of styles and features to differentiate them. Yet all automobiles function pretty much the same way and the basic user interface -- dashboard, steering wheel, ignition -- is fairly consistent. If this were not the case, driving a new rental car would be a nightmare.

"We have to get to that point with other categories of consumer products, but we're just too early up the curve now," says Whitehouse. "In introducing tech products today, the main emphasis is on differentiation and how your product is unique. But if you fast-forward another five or 10 years, you will notice certain functions becoming more similar. You see this now with products like universal remote controls, digital cameras and Apple's Mac mini. Moving us toward this tipping point is the notion that we will start to see ease of use become the most compelling feature of all."

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