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Top-Down Disruption

As Clayton Christensen warns, look out for the underdog — but also beware the leader of the pack.

by Nicholas G. Carr

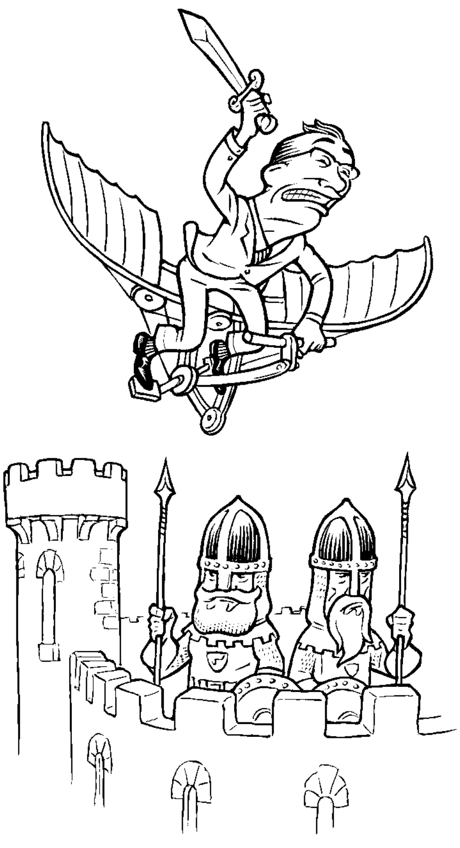

Illustration by Lars Leetaru

They're the stuff of entrepreneurs' dreams and CEOs' nightmares. They made Andy Grove paranoid and Bill Gates rich. They're what propelled Wal-Mart past Sears and what spurred the rise — and subsequent collapse — of the Digital Equipment Corporation. They're what we've come to call *disruptive innovations.*

Our understanding of these epoch-making technologies, products, and business models has been shaped largely by the works of Harvard professor Clayton Christensen, particularly his 1997 book *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail* (Harvard Business School Press). Professor Christensen draws an important distinction between innovations that sustain the competitive status quo of a market (by enhancing existing products according to the traditional measures of performance known to be valued by customers) and those that upset the status quo (by fundamentally altering the way customers think about product performance). Whereas sustaining innovations are often pioneered by established companies, disruptive ones usually come from newcomers — and thus can pose a mortal threat to even the most dominant of industry leaders.

Professor Christensen also offers a model for what a disruptive innovation looks like. He argues that, when initially introduced, a disruptive product or service generally "underperform[s] established products in mainstream markets," "almost always takes root in a very undemanding application," and "sells for less money" than current offerings. It tends to be ignored by the majority of buyers, who view it as falling short of their needs, and shunned by traditional suppliers, who see little to gain by selling a cheap product to a niche market. Because of these characteristics, the innovation initially gains a foothold in the lower reaches of the market, among less discriminating customers. Then, as its performance steadily improves, it rises to redefine the entire market, displacing industry incumbents in the process.

A good example, cited by Professor Christensen, is the triumph of steel minimills over integrated producers during the 1970s and 1980s.

To create steel products, minimills melt scrap steel in relatively small electric ovens, a much simpler and cheaper process than the traditional method of melting iron ore and other ingredients in enormous blast furnaces. When minimills first emerged, the quality of their output was inconsistent, limiting them to producing the cheap rebar used to reinforce concrete — a low-margin market that the big steel makers were more than happy to abandon. But as the minimills improved their processes and product quality, their intrinsic cost advantage enabled them to trounce the integrated producers in ever more demanding markets, from structural beams to sheet steel. The minimills, like the other innovations in *The Innovator's Dilemma* model, spread disruption from the bottom up.

That model has been extremely valuable to managers. It explains the real reason that many big, successful companies fail to survive major technological or other market shifts. But in its single-minded focus on bottom-up disruptions, the model is also potentially dangerous. It may lead managers to overlook a very different sort of disruption — one that emerges not at the bottom of the market but at the top.

In stark contrast to the bottom-up variety, top-down disruptive innovations actually *outperform* existing products when they're introduced, and they sell for a premium price rather than at a discount. They're initially purchased by the most discriminating and least price-sensitive buyers, and then they move steadily downward, into the mainstream, to recast the entire market in their own image. A top-down disruption is as revolutionary as a bottom-up one. But the good news for incumbents is that they have a much better chance of surviving, or even spearheading, the former than the latter.

Cost Curve Riders

FedEx's overnight document-delivery service and Wang Labs' word-processing system are two examples of top-down disruptions that overturned established markets. When Federal Express started up in the early 1970s, the U.S. package-delivery business was dominated by two big organizations. The United States Postal Service held a near-monopoly on the delivery of letters and other documents, and it also shipped small parcels, mainly between residences. United Parcel Service (UPS) had a flourishing operation shipping packages of various sizes to homes and offices.

In pursuing their particular business models, both the postal service and UPS overlooked an opportunity at the high end of the market. Businesses often needed to ship documents to other businesses very quickly, and these time-sensitive commercial customers were more than happy to pay a premium for such a service. FedEx saw this competitive opening, and it organized itself to deliver documents and other small packages overnight, using its own fleet of aircraft. On a critical measure of shipping performance, delivery time, FedEx's service outstripped that of its competitors — the best UPS could offer was second-day delivery — and it was able to charge its exclusive set of customers a high price for its unprecedented speed.

The profits from this lucrative niche eventually allowed FedEx to expand its operation, and the resulting scale economies, together with

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continuing technological advances in managing and tracking shipments, enabled it to introduce more affordable services that appealed to the broader business market. By fundamentally changing customers' expectations regarding shipment speed and service, FedEx disrupted the entire package-delivery market. Caught flat-footed, both the postal service and UPS had to retool their operations to compete with the fast-growing upstart.

Wang's word-processing system followed a similar top-down trajectory. Wang Laboratories introduced its microprocessor-based word-processing system in 1976, a quarter-century after the company's founding. Although rudimentary word-processing applications had been in existence for some years, at the time most business documents were still typed on typewriters, and even minor revisions required laborious cycles of marking up and then retyping pages. Wang's system, which combined desktop workstations with a central data server, offered superior performance on almost every measure of document production, including revision speed, output quality, reprint capability, and the ability to support collaborative composition.

Companies with intensive requirements for document production, such as law and consulting firms, were happy to pay a premium to gain these benefits and reap the resulting productivity improvements. Like FedEx, Wang was able to capitalize on its early success — and on the continuing fall in computer component prices — to introduce cheaper systems that were appealing and affordable to the broader business market. It too disrupted the industry by changing the expectations and buying criteria of customers. (Wang's reign was short, however. In just a few years, it would fall victim to a Christensen-style bottom-up disruption, as corporations embraced cheap PC programs for word processing, such as Micropro's WordStar and Microsoft's Word.)

FedEx, Wang, and Apple used a high-end niche to launch a raid on the broader market.

The FedEx and Wang stories reveal why top-down disruptions can be so powerful. Innovative, top-notch products are usually very costly to produce. In the early stages of their development, only a small group of power users is able to justify their purchase. But production costs tend to go down quickly, as suppliers gain experience and scale and as the prices of the underlying technologies drop. At the same time, the broader market becomes aware of the benefits of the new product and increasingly open to embracing it. The astute innovator thus is able to use a high-end niche as an outpost for launching a raid on the broader market. The top-down disruptor simply follows the cost curve into the mainstream of buyers. In the process, it redefines the industry — and secures its own competitive dominance.

Beyond Trendsetters

For contemporary examples of top-down disruptions, look no further than the current tumult in the media world. The traditional radio industry, for instance, is facing a major threat from the top-down disruption of satellite radio. Pioneered by two companies, XM and Sirius, satellite radio offers clear performance benefits over the familiar through-the-ether version. First, there are no commercials. Second, there's a much broader menu of programming choices, from punk to bluegrass to swing. Third, you can listen to the same station anywhere you want — the signal doesn't fade as you get further from a land-based transmitter. Fourth, the quality of the digital audio is higher than what you get over the airwaves.

As is typical with top-down innovations, satellite radio costs customers more — unlike traditional radio, it's not free — and that has limited the size of its early audience. But technological advances are leading to a slew of new receivers, from car radios to portable tuners to home systems, while also rapidly driving down prices, from about $300 a couple of years ago to about $70 today. The number of subscribers for both XM and Sirius shot up during 2004, and growth promises to accelerate further as radio personalities like Howard Stern move their programs to the new medium. Although its success is not assured, satellite radio is beginning to look a lot like cable television, an earlier top-down disruption that started slowly but then upended an established broadcast medium.

Another recent top-down disruptive innovation — Apple Computer's iPod — has shaken up the market for portable music players, until recently dominated by Sony.

Digitally compressed, Internet-deliverable music existed well before the iPod, of course, as did devices to store it. But before the iPod's introduction in 2001, most popular portable devices held a limited number of songs and sold for fairly low prices. That was true of Sony's original cassette-tape Walkman, of the multitude of portable CD players that flooded the market through the 1990s, and of the first wave of flash-memory-based MP3 players.

The iPod upped the performance stakes immensely. By using a tiny hard drive to store music, it allowed people to carry hundreds, even thousands, of songs with them at all times. Its price, starting at $399, was equally eye-opening — the price of a mid-range component stereo system.

The iPod was not an immediate mass-market hit. Only trendsetters and gadget freaks were initially willing to pay the high price to own one. But Apple steadily introduced attractive new features while also driving the iPod's price down with new models, such as the $249 iPod mini and the $99 flash-memory iPod shuffle. Such moves have enabled the company to expand its reach steadily into less demanding and more frugal market segments. Now both fashionable and more affordable, the iPod has captured the lion's share of the market for portable music players — and fundamentally changed the way customers think about the products.

The Incumbent's Advantage

As Professor Christensen has shown, bottom-up disruptions are usually deadly for established players. Successful companies find it difficult, if not impossible, to sacrifice their current, high-margin business in order to pioneer a cheap, low-end alternative. They're essentially paralyzed, unable to respond to the threat, even though they can see it mounting steadily. But that is not necessarily the case with top-down disruptions. Although such innovation breakthroughs don't sustain a market's comfortable status quo, they do offer the possibility for strong profits even during their formative years. Economically, therefore, they can offer attractive opportunities for big firms as well as entrepreneurial startups.

Nevertheless, established companies, from UPS in overnight package delivery to Sony in digital music players, routinely miss chances to spearhead top-down disruptions. Which forces the obvious question: Why?

In contrast to bottom-up disruptions, there doesn't seem to be a single, general explanation for such failures. Sometimes, the cause is simply the myopia that often afflicts successful companies: They become so focused on fine-tuning their existing business that they overlook fresh opportunities entirely. In other cases, big companies have so geared their operations — and their managerial assumptions — to serving the mass market that they can't imagine launching a premium offering to a relatively small group of buyers.

And then there are the various internal business conflicts that can prevent a large company from taking the risks required to branch out into a new market. By the time MP3 music players debuted, for instance, Sony was no longer just a consumer electronics company; it also owned such major record labels as Columbia, RCA, and Epic. Knowing that the digital players would often be filled with illegally copied songs, Sony's management was naturally nervous about taking the lead in promulgating the spread of the new devices. Apple, a newcomer to the music business, had no such compunctions. Moreover, Apple was in a far better position than Sony to negotiate distribution arrangements with all the major record labels, enabling it to spearhead the legal sale of downloadable songs through its iTunes Music Store.

The investments required to shift into an uncertain new business can also be hard for established companies to justify. At the time FedEx launched its next-day air service, UPS had for years devoted its capital to expanding its ground transportation system, particularly the fleet of brown trucks that formed the heart of its operation and image. The company's two-day "Blue Label" air service was very much a sideline; rather than operate its own planes, UPS simply rented space in the cargo holds of commercial jets. The cost and risk of buying and maintaining a fleet of aircraft — in effect, running an airline — were simply inconsistent with UPS's heritage and strategy. It was not until 1981 — 10 years after the founding of FedEx — that UPS

Established companies routinely miss chances to spearhead top-down innovations.

purchased its first cargo plane.

Clearly, entrepreneurs and other new entrants have advantages in instigating top-down disruptions. With less baggage and fewer internal conflicts, they can often act more quickly, more creatively, and with greater focus.

But that doesn't mean that established companies are fated to lose. For all their constraints, they often have important advantages of their own: strong distribution systems and sales forces, ready access to investment capital, and deep knowledge of the marketplace. In many cases, moreover, they may already have an "in" with the high end of the market. Wealthy, fashion-conscious buyers may be part of their traditional customer base, or their brands may carry connotations of quality and prestige. By understanding the dynamics of top-down disruptions — and how they differ from those of the bottom-up variety — managers of big companies will be better prepared to temper their weaknesses and make the most of their strengths.

The playing field, in short, is much more level for top-down disruptions than for bottom-up ones. Simply by recognizing that disruptive innovations can take two very different forms, managers will expand their options, both defensive and offensive. As a result, they'll be more likely to lead their companies successfully through tumultuous times. No one's immune to the consequences of a top-down disruption, but no one's excluded from fomenting one, either. +

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