Disruptive Innovation and Audiology

BY DAVID FABRY
The term disruptive innovation was coined by Clayton Christensen in his 1997 book, The Innovator’s Dilemma: When New Technologies Cause Great Firms to Fail. Christensen argues that companies don’t necessarily fail because the executives made bad decisions but, rather, because they made the same types of good decisions that had made the company successful to begin with, but without considering changing environments (hence, the innovator’s dilemma is that “doing the right thing is the wrong thing”).

One of the core examples used by Christensen was a case study of Digital Equipment Corporation (DEC), the first successful minicomputer developed in the United States. During the late 1970s, I worked as an undergraduate research assistant in W. Dixon “Dix” Ward and David Nelson’s shared laboratories at the University of Minnesota. One of my primary responsibilities was to run computer-controlled experiments that helped pave the way for establishing the damage-risk criteria for noise exposure in humans. The laboratory computer used was a DEC PDP-8/E computer that used large 14-inch, 2 MByte, removable hard drives (PHOTO 1).

In 1980, a then-fledgling company called Seagate approached DEC regarding their interest in a new 5.25-inch hard drive that they had developed; as the dominant supplier to the minicomputer market, DEC did the right thing by consulting with their customers. The problem was that these were primarily laboratory researchers who had zero interest in the slower, smaller drives. Ultimately, DEC passed on the 5.25-inch drives and, in turn, missed out on the PC revolution when the smaller drives enabled computers to be removed from the “rack” and placed on a “desktop” (PHOTO 2). As Christensen sees it, when established companies (such as DEC) are “held captive by their customers,” they miss out on emerging markets of buyers who are not their customers. IBM and others jumped on the opportunity, and DEC was history.

I read Christensen’s book shortly after it was published and watched as it has achieved an almost cultlike status in the business community, especially in Silicon Valley. Over the years, its merits and validity have been widely debated (e.g., Gilbert, 2014; Lambert, 2014; Lepore, 2014), but, as the adage goes, “given all the manure, there must be a pony in here somewhere.”


Photo 2. “There is no reason for any individual to have a computer in his home.” Ken Olsen, cofounder of Digital Equipment Corporation (DEC).
**Christensen’s Model**
I have often wondered how the profession of audiology might be disrupted. To explore that issue further, consider a few elements from Christensen’s model.

**Measurable performance or technology.** In any market, performance is both relative to an industry and relative to a market segment. For example, performance in academic environments could be graduation rates, employment rates or salary for new graduates, GRE scores for graduate programs, etc. For products, this could include hearing aid compression channels, directivity index measures, or added stable gain for feedback cancellation.

**Competition.** In a competitive technology market, institutions or companies fight for market share, and they tend to do this by improving their performance measures. In many cases, they tend to innovate faster than their customers’ needs evolve and end up producing products or services that are actually too sophisticated, too expensive, and too complicated for many customers in their market.

**Multiple tiers.** Christensen also found that disruptive environments demanded performance among high- and low-demanding customers (FIGURE 1). As competition increases among established entities, performance improves through “sustaining innovations” in the higher tiers because this is what has historically helped them succeed—by charging the highest prices to their most demanding and sophisticated customers (at the highest price), this helps achieve the greatest profitability. By doing so, however, institutions unsuspiciously open the door to “disruptive innovations” among the low-demand users. An innovation that is disruptive allows a whole new population of consumers at the bottom of a market access to a product or service that was historically only accessible to consumers with a lot of money or a lot of skill. By definition, disruptive innovations always occur when a product or service takes root initially at the “bottom” of a market and then moves relentlessly upward, eventually displacing more established competitors.

**Gaps occur in the lower tiers.** Characteristics of disruptive strategies, at least in their initial stages, may include simpler products/services that are not as attractive to existing customers when compared against traditional performance metrics. Furthermore, because the lower tiers provide lower gross margins, they are also less attractive to existing competitors, creating space at the bottom of the market for new disruptive competitors to emerge. The disruptor isn’t competing against other suppliers but against “non-consumption.” It is creating new consumers. The innovation occurs for low-demand customers (FIGURE 1) because it has been made affordable to the masses—not just the wealthy and the “early adopters.” When the range of performance that customers (or patients) use decreases, both market disruption (starting in the bottom, then moving up) and commoditization (in the top tiers) may occur. Commodity is a product for which there is demand but which is supplied without qualitative differentiation across a market. It is often the ultimate byproduct of disruptive innovation.

**FIGURE 1.** Clayton Christensen’s model of disruptive innovation.
Audiology and Disruptive Innovation

Chances are that you are reading this electronically, rather than on a printed copy. Perhaps you are reading it on your smartphone, which for many has eliminated the need for a “home” phone, camera, or separate music/media player. Although tempting to suggest otherwise, we would be foolish to think that it can’t happen to us (FIGURE 2). Arguably, the past couple decades have been great ones for audiology, rising from relative obscurity to a profession that frequently makes “best of” lists in recent years (see www.forbes.com/pictures/mkl45efdek/5-audiologist).

So where are the storm clouds? Two areas come to mind.

Graduate School Tuition

According to the American Academy of Audiology Salary Survey, audiologists’ salaries have increased steadily since the transition to the AuD (2013) but are increasingly pressured by rising tuition costs. Student loan debt has reached six figures for many health-care graduate programs, and audiology is no exception.

Kudos to Rush University for their transparency regarding average student loan debt by discipline (Rush University, 2014). According to many financial consultants, you shouldn’t borrow more than you expect to make in the first year, postgraduation. And therein lies the rub: there aren’t that many of those jobs around, and most involve dispensing hearing aids in private practice, which isn’t for everyone. I was fortunate to have earned my degree during an era when more public funding was available for students in the form of scholarships, Pell Grants, and research/teaching assistantships. Furthermore, tuition increased 1134 percent between the time that I entered college in 1977 and my daughter, Loren, graduated in 2014 (FIGURE 3). This issue transcends audiology, but we will start to lose access to the best and brightest students to other fields if we do not address the “gap” between student investment and salaries.

There are more questions than answers, but for the purpose of debate, I will offer that we need to investigate larger AuD class size, hybrid “inverted” or “flipped” classroom models, massive open online courses (MOOCs), and anything that doesn’t compromise quality, competence, or ethics. On the practice side, we need to preserve a strong, independent private practice culture that provides professional autonomy and financial independence. That said, private practice shouldn’t be the only vehicle for those who wish to practice clinically, but we need to “disrupt” the status quo of our clinical models. To wit: Audiology is one of the only doctoral-level professions that does not routinely use support personnel to improve clinical efficiency. Whether it is due to professional insecurity, lack of

FIGURE 2. It won’t happen to us.
certification programs, or turf battles with other professions, we need to address this need sooner rather than later to prevent disruptive innovation from addressing the global need for hearing health practitioners to meet the burgeoning population with hearing loss.

**Hearing Instrument Distribution**

The elements from Christensen’s model are all there—relatively low market penetration, with a relatively small number of competitors fighting for business with existing customers rather than first-time users (only one-third of hearing aid purchases today are made by first-time users). The pace of innovation has been rapid, and as a result, hearing aids are viewed by some as too sophisticated, expensive, and complicated for many customers in the market. As a result, there have already been attempts to disrupt the hearing aid distribution process: personal sound amplification products (PSAPs), Internet sales, “big-box” stores, to name but a few. And although six manufacturers are responsible for 90 percent of the global hearing-aid market, there have been numerous, unsuccessful attempts by new disruptive competitors (e.g., Bausch and Lomb, Johnson and Johnson) at the low-to medium-demand end of the market.

To date, digital hearing aid technology has provided dramatically improved technology, preserving sales for mid- and high-demanding users but with no dramatic improvements in market penetration or user satisfaction. How can audiologists and manufacturers prevent outside disruption while addressing the large “non-consumption” factor?

The answer might be found in audiology’s history. Past potential disruptors have mistakenly focused exclusively on technology and minimized the role of the

![Inflation Comparison: Percent Growth](image)

*FIGURE 3. Inflation comparison between tuition, health care, automobile, food, and energy.*
practitioner when it comes to the hearing aid distribution process. This depersonalization failed to recognize that the “patient journey” to hearing aids begins long before the audiogram, and continues well after the initial fitting. Commitment to a “best practice” approach that provides counseling, assessment, fitting, and aural rehabilitation that is both structured and personalized will provide patient engagement that prevents disruption and commoditization of the clinician’s role. More recently, the transition to receiver-in-the-canal (RIC) devices with dome tips and “easy-fit” buttons, with little patient/clinician engagement has opened the door to low-demand products by new disruptors. Candidly, with hearing aid market penetration estimated to be as low as 20 percent, it may be an ideal way to attract new users. But the key to sustaining the audiologist’s role for mid- and high-demanding users is through patient engagement.

Conclusion
Disruptive innovation is ubiquitous in today’s fast-paced, technology-driven world. It will impact audiology, but we need to remain mindful that we are a health-care profession with roots that are deeply seated in communication, engagement, and rehabilitation. Curiously, for all the enthusiasm surrounding MOOCs and “flipped” classrooms, the results (to date) are equivocal, with many students reporting lack of engagement or dissatisfaction with outcomes (ASEE, 2014).

Furthermore, while PSAPs and Internet devices may fill the “gap” at the low-demand end of the hearing device market, they will not replace the mid- and high-demanding patients, as long as we create a palpable, memorable patient experience that differentiates performance (Figure 1). There is no magic formula, but it is up to us as teachers, mentors, and professionals.

References


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