

The Innovator's Dilemma as a Problem of Organizational Competence

Rebecca Henderson

Introduction

This paper explores the role of embedded organizational competencies in shaping the innovator's dilemma. I argue that while popular accounts of Christensen's theories often focus almost entirely on the role of cognitive failures in the senior team as the central explanatory construct, this focus obscures the critical role played by deeply embedded customer or market-related competencies in shaping the ways firms respond to disruptive innovations.

It has now been nearly eight years since Clayton Christensen first published *The Innovator's Dilemma* (1997). Since then it has not only had a dramatic impact on practice—*disruptive innovation* is now a common term of art—but it has also served to reignite debate within academia as to the role of the market in shaping incumbent response to discontinuous technological change.

Christensen's work brought an intriguingly different perspective to the existing literature. Scholars studying the management of technology had, by and large, located the difficulties established firms encountered in responding to discontinuous innovation as a problem of competence. Much of this work was supply-side focused—failing incumbents appeared to fall victim to competence-destroying innovations that made it difficult for them to introduce the next generation of technology (e.g., Henderson and Clark, 1990; Tushman and Anderson, 1986). But research had also identified the difficulty established firms encountered in responding to shifts in the market

place (e.g., Abernathy and Clark, 1985) and in the larger institutional and social regime (e.g., the excellent survey in Chesbrough, 2001).

Christensen (1997) explicitly rejected problems in technological competence as an explanation for firm failure in the examples he described—in the disk drive industry, for example, he demonstrates quite clearly that the incumbent firms had no difficulties in developing the next generation of product—and instead focused attention on problems in decision making at the most senior levels. Drawing on resource dependency theory, he argued that senior teams are, in essence, captured by their largest, most profitable customers, making it exceedingly difficult to allocate resources to initiatives that serve new customers at lower margins.

The fact that Christensen's work has met with such success suggests that this explanation resonates deeply with practicing managers. My own experience in working with senior teams grappling with potential disruption has also highlighted its usefulness. Time after time I have seen senior conversations about long-term innovation strategy hijacked or short circuited by appeals to the pressing needs of large, highly profitable customers, and as Eisenmann's work in the newspaper industry has shown, sheltering new initiatives from the margin pressure characteristic of the current business may be a critical step toward building successful disruptive businesses (Eisenmann and Bower, 2000). Christensen's hypothesis is thus a critically important idea that must play a central role in understanding why disruption creates so much competitive turmoil.

Nevertheless, this article argues that a focus on the dynamics of decision making in the senior team as the dominant explanation for why established firms so

Address correspondence to: Rebecca Henderson, MIT Sloan School, E52-543, 50 Memorial Drive, Cambridge, MA 02142. Tel.: (617) 253-6618; E-mail: rhenderson@mit.edu.

often miss disruptive innovations is potentially misleading—particularly as it has been interpreted in the popular press. I suggest that organizational competence, in the traditional sense of the embedded organizational routines of established companies, may be much more central to established firm failure in the face of disruptive innovation than is generally acknowledged. Christensen himself offers tantalizing hints of this possibility throughout his published work, and I argue that expanding on these hints to acknowledge the depth and complexity of the role played by embedded organizational competence is critically important in understanding why responding to disruptive innovation is so difficult for established firms.

The article begins by tackling the important question of whether it is rational, from the perspective of the shareholders, for established firms to respond to disruptive innovation. Although popular interpretations of Christensen's work assume that established firms not introducing disruptive innovation are failures, I argue that as Christensen himself acknowledges this is not an easy question. Indeed if established competencies in production and marketing are not only difficult to change but also, by their very presence, are barriers to the development of new, more appropriate competencies, then deciding not to respond to disruptive innovation may be a completely rational choice.

I then turn to a discussion of the circumstances in which a response to disruptive innovation would have been, *ex post*, a rational decision and explore why established firms find it so difficult to respond appropriately even in this subset of cases. I build on the work of Ron Adner, who in a sequence of careful papers has shown how changes in the structure of consumer demand—in combination with technical progress—almost certainly lie behind the phenomenon of disruption (e.g., Adner, 2002; Adner and Zemsky, 2005). I argue that the established routines of large incumbent firms make it particularly difficult for them first to sense and then to act on precisely these kinds of shifts, so that the decision-making dynamics highlighted by Christensen may be as much a product of failures in what one might call *market-related competence*—or of what Danneels (2002, 2004) calls *customer competence*—as they are of resource dependence. The article concludes with a brief discussion of the implications of this hypothesis for future research and for our understanding of the dynamics of technical and competitive change.

Is It Rational to Respond to Disruptive Innovation?

Are established firms irrational in failing to respond to disruptive innovation? Christensen's work can, I think, be read both ways on this point, but it is a central question that deserves clarification. My reading of the *Innovator's Dilemma*, and certainly popular interpretations of the work, seems to suggest that senior teams failing to invest in disruptive innovations are irrational—that they should have made the appropriate investments but were unsuccessful in doing so because they were blinded by current customers and larger margins. However, in the *Innovator's Solution* this stance has shifted: the book can be read as suggesting that established managers who do not respond to disruptive innovation are, in fact, acting in their firm's best interest.

The asymmetries of motivation chronicled in this chapter are natural economic forces that act on all business people, all the time. Historically, these forces almost always have toppled the industry leaders . . . because disruptive strategies are predicated upon competitors doing with it in their best and most urgent interest: satisfying their most important customers and investing where profits are most attractive (Christensen and Raynor, 2003, p. 55).

The neoclassical literature has identified a number of cases under which established firms might rationally choose not to invest in innovation threatening to displace them (e.g., the survey of the issue in Henderson, 1993), and it seems plausible that at least some disruptive innovations meet these criteria. If, for example, an investment by the incumbent firm will significantly accelerate the date at which a replacement technology will be introduced, then under some circumstances it may be rational for an established firm to delay its own investment until it can be certain the new technology will be introduced by another firm. But this does not seem to be the reasoning for the majority of disruptive innovations identified in the literature.

When there is no danger of self-induced cannibalization, the neoclassical literature would suggest that if it is rational for an entrant to invest in a particular technology it should also be rational for an incumbent to invest in the same opportunity. Intuitively, if an opportunity yields a return at greater than the prevalent cost of capital, then it should be attractive to all potential investors—including incumbents—and the only (rational) reason an incumbent might choose not

to invest is if it is capital constrained and the financial markets are willing to fund entrants but not incumbents. The availability of the incumbent's other, higher-margin projects should not, in a perfectly rational neoclassical world, have any effect on its willingness to take on additional profitable projects.

Does this mean we can safely assume that, except for a few marginal and uncommon cases, managers who fail to invest in disruptive opportunities are irrational—at least from their shareholders' perspective—and blinded by their existing mental models or captured by their dominant constituencies?

I think not. Another possibility is that senior managers rationally anticipate the constraints placed upon them by their existing organizational competencies. As Leonard-Barton (1992) suggested, the same competencies that may be an organization's most enduring source of competitive advantage may also be *competency traps*—engrained habits and ways of behaving that make significant change in the organizations modes of operation extraordinarily difficult. Reconfiguring an organization to take advantage of new opportunities is extremely difficult, particularly if doing so requires the development of new production capabilities, new logistics or distribution systems, or new channels to market. Building a new unit within the old to take advantage of new technology is one possible solution, but the literature suggests that such units have significant difficulty putting in place appropriate incentive structures and in successfully imitating the behaviors of successful entrants (e.g., the survey reported in Campbell et al., 2003). Viewed from this perspective, a senior team's decision to refrain from investing in disruptive innovation can seem much more rational. Why invest in opportunities the firm is much less likely to be able to exploit than *de novo* entrants or than firms entering from related fields are already equipped with appropriate capabilities?

Christensen's (1997) work hints that such forces may be at work. For example, in the *Innovator's Solution*, he and his coauthor suggest that incumbent firms failed to invest because "the cost structure of that model and of their distribution and sales channels was not competitive" (p. 106). But if this is the dominant force behind the upheaval we associate with the *Innovator's Dilemma*, it stems from an old-fashioned concern with competence rather than with any misperception by the senior team. Incumbent firms fail to respond to disruptive innovations because responding appropriately requires building competencies they are ill-equipped to acquire and not because

they focus too much on existing customers and high-margin opportunities.

But this is clearly not the sense of the original book or of how Christensen's (1997) work has been widely interpreted. Indeed there are hints throughout even the *Innovator's Solution* that Christensen has something else in mind: that established firms could and should react to disruptive innovation but that something goes wrong that could implicitly be fixed.

Interpreting Christensen (1997) from this perspective, one possibility is that the underlying problem is cognitive. Senior managers cannot understand the promise of disruptive innovation because their views of the world are deeply entrenched and largely shaped by their current experiences. Focusing on their current customers they literally do not see other opportunities. This is consistent with some intriguing recent work suggesting that the cognitive frames of senior managers do, indeed, play a major role in guiding strategic decisions (Kaplan, 2004; Tripsas and Gavetti, 2000).

Another theory is that the problem is political. If power within an organization adheres to those with resources, managers in charge of, or aligned with, the largest and most profitable customers will pull the most political weight and will be able to divert resources to their own projects.

These two interpretations of Christensen's (1997) work have the widest currency, and as suggested already I am deeply sympathetic to both of them: they both clearly play an important role in making it difficult for established firms to respond to disruptive innovation. To them, however, I propose a third, competence-based explanation. As Danneels (2004) suggested, I argue that organizational competencies—particularly market facing or customer competence developed through experience with the existing generation of the technology—make it very difficult to evaluate the promise of disruptive technologies and thus that the senior team is very rarely equipped with the information they might need to make an appropriate decision (Danneels, 2004).

Christensen and Raynor's (2003) distinction between *low-end disruptions* and *new-market disruptions* is a useful building block in this argument. Low-end disruptions introduce products or services that are cheaper and of lower quality than existing products but that offer no other performance improvement. New-market disruptions, on the other hand, offer better performance on dimensions the current customers do not greatly value. Christensen's (1997)

account of the disruption of the steel industry by mini-mills is an example of the first kind of disruption, and I read his account of the evolution of the disk drive industry as an example of the second.

In the case of low-end innovations that move solely down market—like the rebar produced by the mini-mill makers—it cannot be true that the established firms failed to respond effectively because they did not understand the needs of their customers. The steel firms knew that, all other things equal, their customers would like cheaper steel. So they must have chosen not to respond to the mini-mills for one of the reasons outlined already: either they believed they could not effectively develop the appropriate technical competencies; or they did not believe the mini-mills would ever be able to compete effectively against them; or they were captured—rationally or irrationally—by their existing margins. In new-market disruptions, a different explanation may be at work. Consider, for example, the case of chocolate confectionery and the energy bar.

Chocolate confectionery is an old industry dominated in the United States by two private firms, Hersheys and Masterfoods USA, and by Nestle, the European giant. Chocolate bars are sold through mass food outlets, small mom-and-pop retailers, and other convenience stores. The industry is characterized by intense competition and relatively high rates of product introduction but is also believed to be reasonably profitable. The big brands, including Hershey's Kisses and Masterfood's Snickers, have dominated the market for many years.

The first commercially produced energy bar—the PowerBar—was introduced in 1986 as a nutritional supplement for athletes. It sold well, and over the next 20 years a variety of firms entered the industry. Energy bars moved gradually into mass-market food outlets as designed for general consumption. Although revenue numbers are not available either for mass-market confectionery or energy bars, my best guess (extrapolating from the relative shelf space at my local supermarket) is that energy bars have yet to approach confectionery sales in volume, and it is probably too early to tell if energy bars are disruptive innovations in Christensen's (1997) sense. My focus here, however, is this: If they were, what barriers might be in the way of the incumbent firms recognizing the nature of the threat they pose and taking action?

Pulling apart this relatively simple example yields insight into the kinds of market-facing competencies I believe may be why established firms have difficulty

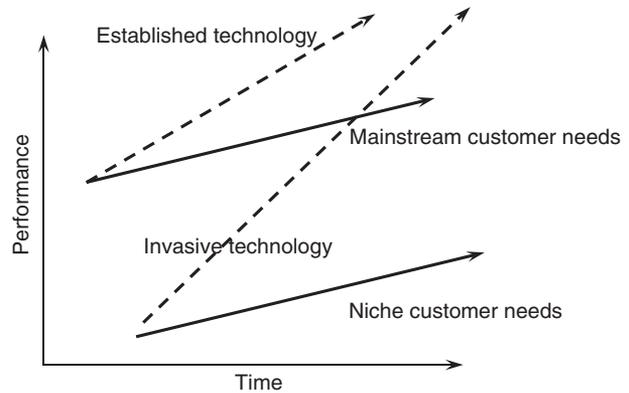


Figure 1. The Progress of Low-End Disruptive Innovations

responding to disruptive innovation. First, it seems unlikely that energy bars will follow the classic “Christensen” path (Figure 1). On the dominant measure of performance in the confectionery business—taste—energy bars do not perform well at all, and it seems to be a stretch to believe they will ever taste as good as conventional candy.

Another way into the problem is to construct a simple market map, with the critical performance dimension for the existing product on the vertical axis and the performance dimension dominated by the disruptive technology on the other. Such a map defines the conventional chocolate bar and the energy bar as at least initially selling into two separate markets, meeting two different combinations of needs: a market in which consumers are willing to trade off (1) perceived nutritional value for taste; and (2) taste for perceived nutritional value (Figure 2).

It is conceivable, of course, that the taste of energy bars will improve so significantly they will move to the

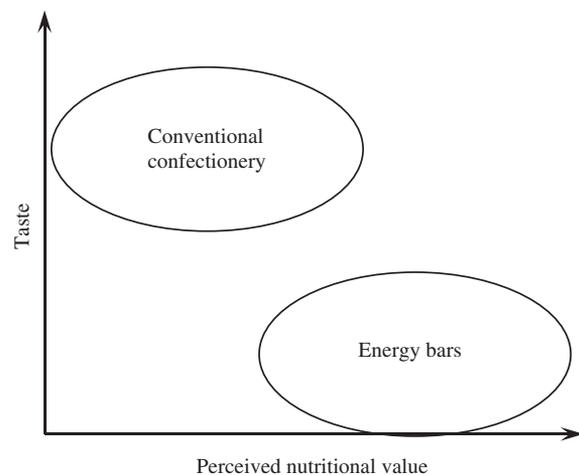


Figure 2. A Simple Market Map for Chocolate Confectionery

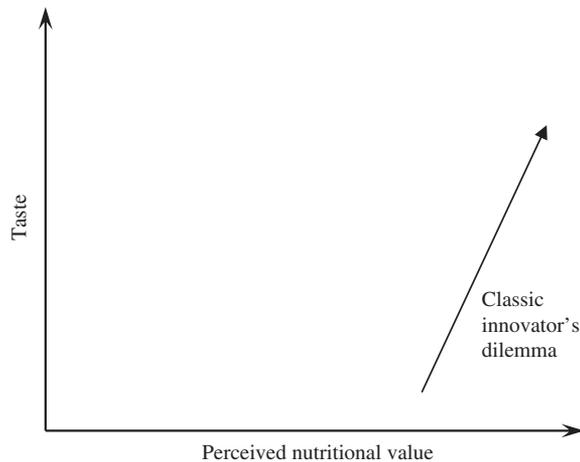


Figure 3. The Classic Innovator's Dilemma

upper-right-hand quadrant of this diagram, and ex post Christensen's diagram could be drawn (Figure 3). But such a move seems unlikely in the short term. A more plausible scenario is that customer preferences may shift; that is, consumers who have historically been willing to sacrifice nutrition for taste will become increasingly reluctant to do so, and the market itself, or the bulk of customer preferences, will move to the bottom right of the diagram (Figure 4).

I have come to believe that many disruptive innovations have exactly this characteristic. They come to reshape the pattern of preferences in a market, and this is particularly difficult for established firms to respond to effectively for reasons that flow directly from the nature of the embedded organizational competencies of the firm.

Suppose, for example, that the confectionery companies had attempted to understand the threat posed by energy bars when they were first introduced by

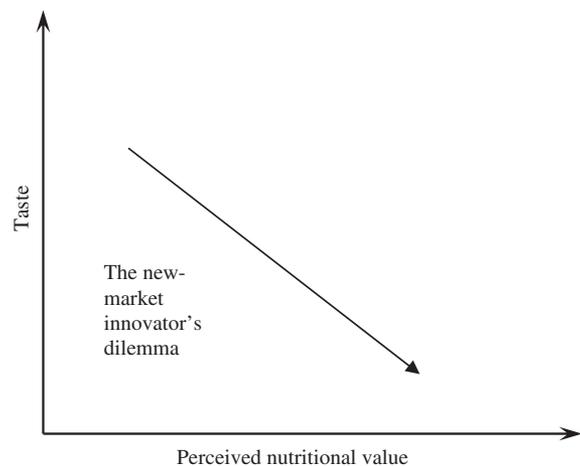


Figure 4. The Innovator's Dilemma for New-Market Disruptions

doing market research with their best customers. My guess is that their most loyal customers, who happen to be adolescent males, would almost certainly have responded badly to the energy bar (local experiments have produced responses like "Take this away; it tastes like cardboard"), since by definition a firm's best customers are likely those who place the most value on the dominant performance metrics of the current product, which is one of Christensen's (1997) central points. This could be a problem of shortsightedness or inertia, of being overly enamoured of existing margins. Or it could be the case that in order to understand the appeal of the energy bar, the confectionery companies needed to understand an entirely different market segment (initially athletes, and later nutritionally aware older consumers), in what might ultimately prove to be nothing but a niche market.

Levinthal and his collaborators (Levinthal, 1997; Rivkin, 2001) recently suggested that it may be helpful to think of organizational inertia as being driven by processes of local search over *bumpy landscapes*. Viewed from this perspective, established, successful firms develop highly effective routines for searching around their local peak: They build a rich understanding of their current customers, for example, and invest heavily in distribution systems to reach them. Such firms usually develop not only deeply embedded cognitive models and shared systems of understanding (e.g., "In general, our customers view our product as an indulgence or a treat") but also deeply embedded systems of incentives that reinforce, and are in turn reinforced by, the local experience of the firm (Kaplan and Henderson, 2005).

Exploring a new, possibly disruptive, market thus requires major changes in patterns of behavior and search (Danneels, 2002). Given that many new markets do not prove to be profitable and that it takes time to learn about them, any degree of real uncertainty may plausibly make such distant search unprofitable on an expected value basis. To the degree that processes of resource allocation within the firm are driven by current customers, this problem will be compounded, but even in the absence of this issue one can readily construct models in which rational firms will continue to search locally and to concentrate on their existing markets.

Much in Christensen and Raynor's (2003) recent book, *Innovator's Solution*, is consistent with this hypothesis. In the book, Christensen lays considerable stress on techniques firms can use to understand new-market opportunities. He discusses, for example, how

consumers “hire” products to perform “jobs” for them and how a deep understanding of these jobs can guide new product development. Indeed, the book can be seen as laying out tools and techniques that will help firms develop the customer-facing competencies to enable them to respond to disruptive innovation and is thus quite consistent with the hypothesis that it is the lack of exactly these kinds of competencies that creates problems in the first place.

The book’s explanation for why firms fail to use these and other innovative techniques is not completely convincing, though. Christensen and Raynor (2003) suggest, for example, that Sony’s failure to move effectively into new markets after the founder’s departure was a function of “MBAs who brought with them sophisticated, quantitative, attribute-based techniques for segmenting markets and assessing market potential” (p. 80) rather than the deep intuition guiding early product development at the firm. Such an explanation again focuses on the senior team’s failure to understand the underlying nature of disruptive innovation—rather than on the fact that in established firms it is much easier and more reliable to understand customer behavior in existing markets.

For the confectionery companies, for example, building an understanding of the potential of the energy bar required a deep understanding of consumers largely peripheral to their current business. Moreover, it required revisiting deeply held assumptions about the nature of their products. Confectionery companies do not, by and large, think of their products as unhealthy; indeed, careful examination of the ingredients list on a typical energy bar reveals little evidence to support the idea that it is any better for the body than a Hershey’s chocolate bar. The appeal of the energy bar is almost certainly much more about the perception of nutrition than the reality. And understanding this requires arriving at the uncomfortable reality that for some consumers eating a candy bar in public is something they would rather not do.

Understanding these kinds of deep shifts in consumer behavior is notoriously difficult. There is, after all, a vibrant literature about how difficult it is to understand previously unarticulated consumer needs; viewed from this perspective, disruptive innovation creates problems because it makes obsolete what one might call customer-facing competence in subtle ways that may be very difficult to anticipate. Deep knowledge about customer preferences almost certainly becomes embedded in the organizational routines of a firm and is mediated by the nature of the value net-

work in which the firm is embedded. In the confectionary case, for example, energy bars were sold first through specialist sports outlets, not through the outlets from which the confectionary companies were accustomed to learn, so that for the chocolate companies identifying shifts in customer behavior—and building new product offerings that better matched new preferences—was a classic problem in competence destruction.

Conclusion

Christensen’s (1997) concept of disruptive innovation has had a dramatic effect on both practice and scholarly research. It has reminded us of just how difficult it can be for an established firm to respond to significant shifts in the environment, throwing into high relief problems of cognitive framing and resource allocation. In my view it also makes another critical contribution: It highlights the role of market-facing competence in shaping a firm’s response to disruptive innovation, opening up an important new field for future research.

References

- Abernathy, William J. and Clark, Kim B. (1985). Innovation: Mapping the Winds of Creative Destruction. *Research Policy* 14(1):3–22.
- Adner, Ron (2002). When Are Technologies Disruptive: A Demand Based View of the Emergence of Competition. *Strategic Management Journal* 24(10):1011–1027.
- Adner, Ron and Zemsky, Peter (2005). Disruptive Technologies and the Emergence of Competition. *RAND Journal of Economics* (Summer).
- Campbell, Andrew, Birkinshaw, Julian, Morrison, Andy and van Basten Batenburg, Robert (2003). The Future of Corporate Venturing. *Sloan Management Review* 45(1):30–37 (Fall).
- Chesbrough, Henry (2001). Assembling the Elephant: A Review of Empirical Studies on the Impact of Technical Change upon Incumbent Firms. In: *Comparative Studies of Technological Evolution*, vol. 7, Ed. H. Chesbrough and Robert A. Burgelman. The Netherlands: Research on Technological Innovation, Management and Policy, 1–36.
- Christensen, Clayton (1997). *The Innovator’s Dilemma*. Boston: Harvard Business School Press.
- Christensen, Clayton and Raynor, Michael (2003). *The Innovator’s Solution*. Boston: Harvard Business School Press.
- Danneels, Erwin (2002). The Dynamics of Product Innovation and Firm Competencies. *Strategic Management Journal* 23(12): 1095–1121.
- Danneels, Erwin (2004). Disruptive Technology Reconsidered: A Critique and Research Agenda. *Journal of Product Innovation Management* 21:246–258.
- Eisenmann, T.R. and Bower, J.L. (2000). The Entrepreneurial M-Form: Strategic Integration in Global Media Firms. *Organizational Science* 11(3):348–355 (May–June).

- Henderson, Rebecca (1993). Underinvestment and Incompetence as Responses to Radical Innovation: Evidence from the Semiconductor Photolithographic Alignment Equipment Industry. *RAND Journal of Economics* 24(2):248-270 (Summer).
- Henderson, R.M. and Clark, K.B. (1990). Architectural Innovation: The Reconfiguration of Existing Product Technologies and the Failure of Established Firms. *Administrative Science Quarterly* 35(1):9-30.
- Kaplan, Sarah (2004). Framing the Future: Cognitive Frames, Strategic Choice, and Firm Response to the Fiber-Optic Revolution. Ph.D. diss., Massachusetts Institute of Technology, Cambridge, MA.
- Kaplan, Sarah and Henderson, Rebecca (2005). Organizational Rigidity, Incentives, and Technological Change: Incentives from Organizational Economics? Mimeo, MIT, January.
- Leonard-Barton, Dorothy (1992). Core Capabilities and Core Rigidities: A Paradox in Managing New Product Development. *Strategic Management Journal* 13(2):111-126.
- Levinthal, Daniel (1997). Adaptation on Rugged Landscapes. *Management Science* 43(7):934-950.
- Rivkin, Jan (2001). Optimally Local Search on Rugged Landscapes. Working Paper 98-067, Harvard Business School.
- Tripsas, Mary and Gavetti, Giovanni (2000). Capabilities, Cognition, and Inertia: Evidence from Digital Imaging. *Strategic Management Journal* 21(10-11):1147-1161 (Fall).
- Tushman, M. and Anderson, P. (1986). Technological Discontinuities and Organizational Environments. *Administrative Science Quarterly* 31(3):439-465.