

P E R S P E C T I V E

Disruptive Innovation In Health Care Delivery: A Framework For Business-Model Innovation

Coupling technological advances with appropriately matched business models is the right prescription for our ailing health system.

by **Jason Hwang and Clayton M. Christensen**

ABSTRACT: Disruptive innovation has brought affordability and convenience to customers in a variety of industries. However, health care remains expensive and inaccessible to many because of the lack of business-model innovation. This paper explains the theory of disruptive innovation and describes how disruptive technologies must be matched with innovative business models. The authors present a framework for categorizing and developing business models in health care, followed by a discussion of some of the reasons why disruptive innovation in health care delivery has been slow. [*Health Affairs* 27, no. 5 (2007): 1329–1335; 10.1377/hlthaff.27.5.1329]

IT IS ALMOST REQUISITE that any discussion about the future of health care begin with a reference to the unsustainable growth rate of U.S. medical spending. Charts and graphs expound on health care's accelerating share of gross domestic product (GDP), depicting a voracious beast that threatens to swallow what little money remains for other vital services. And yet, although deliberations about how to curb this dramatic increase in spending are imperative, a related, but equally important, question is often lost amid these debates.

In this paper we attempt to address this other side of the coin. Instead of asking how we can afford health care, we instead ask how we can make health care more affordable. We present a conceptual framework from the world of business administration that explains how other industries have coupled cost-reducing technologies with innovative busi-

ness models to deliver increasingly affordable and accessible products and services. We call the process that drives these advances “disruptive innovation,” and we believe that it is a necessary component to creating a high-performing health care system that is available to all.

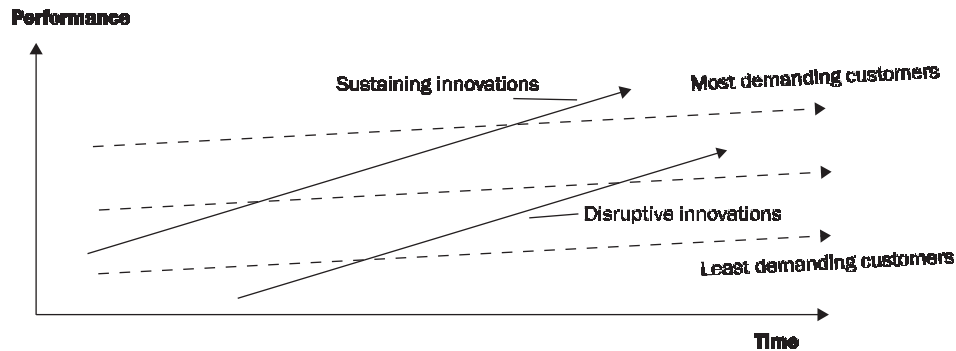
Defining “Disruptive Innovation”

The theory of disruptive innovation helps explain how complicated, expensive products and services are eventually converted into simpler, affordable ones.¹ Exhibit 1 portrays the performance of a product or service, which gradually improves over time. However, there are actually two different trajectories of performance improvement in every market, depicted in the graph by the solid and dotted lines.

The solid lines depict the continual improvement of a product or service that is introduced by companies over time. Although these

.....
 Jason Hwang (jhwang@innosightinstitute.org) is executive director of the Healthcare Practice at the Innosight Institute in Watertown, Massachusetts. Clayton Christensen is the Robert and Jane Cizik Professor of Business Administration at the Harvard Business School in Boston.

EXHIBIT 1 The Theory Of Disruptive Innovation



SOURCE: C.M. Christensen, *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail* (Boston: Harvard Business School Press, 1997).

innovations can be either small and incremental or dramatic breakthroughs, we have chosen to call them all “sustaining innovations” because they sustain the existing trajectory of performance improvement. Sustaining innovations result in better products that can be sold for higher profits to the best customers—a prevailing mantra of the business world that can offer prudent guidance for businesses and entire industries for many years.

However, the dotted lines in Exhibit 1 reflect a different trajectory: customers’ demand for and usage of ever-improving products and services. The spectrum of customers’ desire for increased performance is represented by the multiple dotted lines, but what is interesting is that these lines, beginning with the least-demanding tier of customers, eventually intersect with the trajectory of product improvement. These points of intersection are the graphic representation of the fact that companies upgrade their products with features much more quickly than most customers can use them. And when products begin to pack in more functionality than customers need or desire, a different type of innovation occasionally emerges—a disruptive innovation.

In contrast with sustaining innovations, a disruptive product is actually not as good as what existing customers are already using, and hence it does not appeal to many customers in the existing market. However, because the

new product is usually simpler, more convenient, and more affordable, it enables the participation of a new set of customers who were previously ignored by the market or shut out completely. As shown in the exhibit, not only does this type of innovation take root in a portion of the market that is least demanding or not consuming at all, but it also targets customers who are least attractive to the market leaders. Successful incumbent firms will almost always choose instead to focus on offering sustaining products to their higher-paying, performance-hungry tiers of customers.

Because disruptive products do not appeal to the best customers paying the highest prices, they are almost always introduced by new entrants rather than the dominant incumbents of an industry. Yet once the disruptive product establishes a foothold in the market, it too begins to improve over time, and, one by one, customers of the sustaining company find that their needs can be met by the disruptive innovation. Before long, the leaders find themselves bereft of customers.

Impact Of Disruptive Innovation On Value

Disruptive innovation explains how upstart companies, in an effort to deliver more-affordable and -accessible solutions, are able to sweep away once-dominant firms with alarming regularity, often before the incumbents

and their leaders realize that their days are numbered. Canon did it to Xerox by bringing slower but less costly tabletop photocopiers to the market. Toyota did it to General Motors by introducing less stylish but cheaper models, and now Korean, Chinese, and Indian automobile manufacturers are disrupting Toyota by doing the same thing.

One of our favorite examples was the disruption of the mainframe and minicomputer by the less powerful but more affordable personal computer (PC). Only a few decades ago, access to computing power was very expensive, and computers were complicated to use. To compute, one had to bring a stack of punch cards to a corporate mainframe center or to a university, where highly skilled computer scientists and technicians could help process the jobs. With the introduction of the PC, however, many more people could afford to compute in their own offices and homes without the intervention of specially trained experts. As PCs became more powerful themselves, fewer individuals and businesses needed the expensive computing power of a mainframe. And although we spend far more today on computers than we did in the past, hardly any of us ever questions the fact that we are all better off.

The widespread belief that increased spending in health care, particularly on new technologies, is something that must be

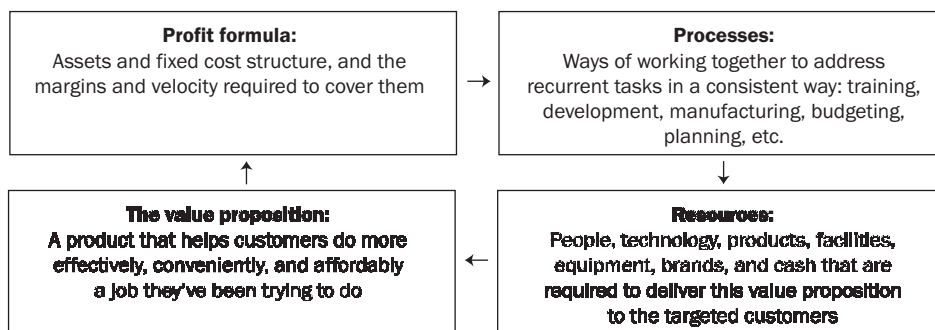
quelled shows how long we have tried to answer the wrong question. When embedded within disruptive business models that capitalize on increased convenience and affordability, new technologies can deliver tremendous value. We next address the critical step of business-model innovation that must be paired with these technologies.

Disruptive Technologies And Business-Model Innovations

We are often asked why, with so many sophisticated medical technologies introduced every year, health care has not been disrupted to a significant degree already. The reason is that technology has almost always been implemented in a sustaining manner in health care—primarily to help hospitals and doctors solve the most complex problems. There is nothing wrong with this, of course, but it does little to make health care more affordable and accessible. To understand why this happens, we must start by analyzing what constitutes a business model.

The starting point of a successful business model is its value proposition: a product or service that helps customers get a job done more effectively, conveniently, and affordably (Exhibit 2). Managers then bring together a set of resources—including people, supplies, intellectual property (IP), equipment, and cash—required to deliver the value proposi-

EXHIBIT 2 The Four Components Of A Business Model



SOURCE: Authors' analysis (with Mark Johnson).

tion. As employees and other resources repeatedly work together to generate the product, processes emerge and become ingrained in the business model. Finally, a profit formula materializes, which defines the pricing, mark-ups, gross and net profit margins, asset turns, and volumes necessary to profitably cover the costs of the resources and processes that are required to deliver the value proposition.

Over time, an established business model begins to determine the types of value propositions an organization can and cannot deliver. In other words, once the pieces of a business model have coalesced to deliver a particular value proposition, the causality of events begins to work in reverse—only value propositions that fit the existing resources, processes, and profit formula of the organization

can be successfully taken to market. In our research on disruptive innovation, the only instances when an original market leader successfully transitioned to becoming a leader in the new disruptive plane of competition occurred when the incumbent established an entirely autonomous business unit organized around the disruptive value proposition. This independent business was therefore allowed to create its own profit formula, making money on lower margins than the parent company could, while processes and resources were also markedly different because they were adopted under the new profit formula.

Many companies actually had disruptive technologies within their grasp but failed to link those technologies with disruptive business models. For example, as the PC market was heating up, Digital Equipment Corporation (DEC), the leading manufacturer of minicomputers, indeed had access to microprocessors. In fact, given the company's industry expertise and experience, it made some of the best ones. But DEC's business model could not profitably make and sell computers for less than \$50,000, and internal business plans that featured microprocessor-based computers

languished in favor of proposals that offered higher-end products for the company's best customers. In contrast, IBM created a very different business model in Florida, allowing it to grow autonomously despite the threat of cannibalizing sales of more-profitable products. DEC was disrupted away, along with all of the other minicomputer manufacturers, while IBM's new business model, with the microprocessor at its core, revolutionized the world.

In health care, most technological enablers have failed to bring about lower costs, higher quality, and greater accessibility. We believe that the primary reason is a lack of business-model innovation, for a variety of reasons that we postulate at the close of this paper.

“In health care, most technological enablers have failed to bring about lower costs, higher quality, and greater accessibility.”

A Typology Of Business Models

Before describing what can and needs to be done in health care, we present a construct for classifying and analyzing business-model innovation. In general, business models can be categorized into three types: solution shops, value-adding process businesses, and facilitated user networks.²

■ **Solution shops.** Solution shops are institutions built to diagnose and solve unstructured problems. Consulting firms, advertising agencies, research and development organizations, and many law firms employ this type of business model. These solution shops deliver value primarily through the people they employ—experts who draw upon their intuition and problem-solving skills to diagnose the cause of complicated problems and recommend solutions—and successful firms are those that can attract the best talent. Solution-shop work tends to be unique for each customer, who is often quite willing to pay very high prices in return.

■ **Value-adding process businesses.** These businesses transform inputs of resources, such as people, equipment, raw materials, energy, and capital, into outputs of greater value. The business model is built to do

this in repetitive ways so that the organization's capabilities are embedded more in its processes than in its resources. Although some value-adding process businesses may be more efficient than others, as a whole they focus their attention on process excellence that can deliver high-quality services and products consistently at a lower cost, and they are less affected than other types of businesses are by the variability that occurs when outcomes depend on people's intuition. Often, results can be guaranteed or redone free of charge. Retailing, restaurants, automobile manufacturing, and petroleum refining are examples of this type of business model.

■ **Facilitated user networks.** User networks are enterprises in which the same people buy and sell and deliver and receive things to and

from each other. In these types of businesses, the companies that deliver value and make money are those that facilitate the effective operation of the network and its user transactions. Mutual insurance companies are user-network businesses—customers deposit their insurance premiums into a collective pool, and they take claims out of it. Telecommunications companies, which facilitate calls and data transfers among their customers, as well as the online auction site eBay, stock exchanges, and many activities of banks are also user-network businesses.

Finding The Right Business Models For Health Care

The two dominant business models in health care—those of general hospitals and physician practices—are solution shops that emerged in an era when nearly all medical care relied on the intuition of highly skilled professionals. But over time, these institutions have subsumed under their organizational umbrellas many activities that are perhaps better suited to businesses based on value-adding processes or user-network models. The legacy institutions of health care delivery are jumbled

mixtures of multiple business models struggling to delivery value out of chaos, incorporating indecipherable systems of cost accounting, excessive overhead, pervasive cross-subsidization, and an unacceptable amount of variability and medical error.

Nevertheless, there are already examples of business models in health care whose resources, processes, and profit formulae appropriately match the nature of their value propositions. Many medical procedures, ranging

from having a nurse use a rules-based diagnostic test to verify the presence of Group A streptococcal pharyngitis and then writing and filling a prescription to cure it, to herniorrhaphy and angioplasty, are value-adding process activities. This type of work is possible only after a definitive diagnosis is made first, often

by a solution shop. But when the value-adding procedures are organizationally separated from the work of solution shops, the overhead costs of the value-adding activities drop so dramatically that focused value-adding process hospitals and clinics can deliver care at prices that are 60 percent lower than those at hospitals and physician practices in which the business models of value-adding process businesses and solution shops are conflated. Institutions such as MinuteClinic, Shouldice Hospital in Ontario, and certain focused cardiology hospitals are examples of value-adding process businesses in health care.³

Meanwhile, although facilitated user networks remain underdeveloped and underused in health care, they are an ideal business model for the care of many chronic diseases. Familiar examples include Weight Watchers and Alcoholics Anonymous; dLife, which created a network for diabetics and their families, is another example of a user-network business that facilitates the exchange of information and care advice among its customers. Using a vast array of patient and insurance carrier data, Revolution Health is building a network that will allow users to find matched cohorts, share

“Legacy institutions of health care delivery are jumbled mixtures of multiple business models struggling to delivery value out of chaos.”

data, and learn from one another. User networks will help shift much of the care of chronic diseases out of the intuitive-based practice of hospitals and physician practices, whose business models are poorly equipped to meet the needs of these people. Similar to value-adding process hospitals that can perform procedures with higher quality and at dramatically lower cost than traditional hospitals, user-network businesses will also improve the quality and reduce the cost of care for many behavior-dependent chronic diseases.

These disruptive business models attempt to deliver value propositions that are distinct from those of hospitals and physician practices. By embedding into their business models the technologies that have simplified the once-complex work performed in solution shops, the disruptive entrants fit together their resources, processes, and profit formulae in ways that hospitals and physician practices cannot match—nor should they be expected to. Because these disruptive businesses focus on specific, rules-based portions of health care, they can deliver care at lower cost and with higher quality than could the models of old. This is because the processes have such predictable variation that work can be transferred from specialists to generalists, from generalists to nurses and other physician extenders, and ultimately to patients themselves.

Pairing technological enablers with disruptive business models is what leads to greater affordability and accessibility, and this is where health care entrepreneurs and policy-makers must focus their energy if the same degree of innovation is to be brought to health care that has already transformed numerous other industries.

Challenges To New Business Models In Health Care

■ **Fragmentation of care.** Carving focused facilities and user networks out of today's mixed models of health care delivery might indeed capture unrealized efficiencies and cost savings, but they also might fragment the delivery of care. Coordination of care in

such a system is critical, and the importance of interoperable health information technology (IT) cannot be stressed enough. Health IT systems must serve as the connective tissue joining the various pieces of health care delivery into a coherent system that delivers continuity through safe, satisfying relationships. The role of care coordination can also be performed to varying degrees by a patient-centered medical home (PCMH), telephonic services such as Revolution Health's Nightingale service, Web-based decision-making software, and personal health records (PHRs).

■ **Lack of a retail market.** Disruptive innovation requires that a market of consumers carry proper incentives to shop for products and services that best meet their needs. This has long been the criticism of the third-party payer system, and dizzying combinations of deductibles, coinsurance, copayments, and limits have failed to create the true retail market necessary to generate shopping behavior. Health savings accounts (HSAs), in combination with high-deductible health plans, are perhaps the best vehicle available today to encourage rational health care purchasing decisions.

However, it is important to recognize that the health care system comprises highly interdependent business models, and one cannot simply plug in a new component and expect it to work. HSAs do create proper incentives for healthy behavior, but as long as the health care delivery system remains costly and inconvenient, customers rationally avoid spending their money on those services. In other words, until we see business-model innovation in health care delivery in conjunction with HSAs, we will continue to see individuals paradoxically avoiding the healthy behavior that these vehicles were meant to encourage.

■ **Regulatory barriers.** Well-known battles over federal moratoria on focused specialty hospitals, state certificate-of-need (CON) policies, and restrictions on physicians' ownership of medical facilities have all involved impassioned claims by proponents of the status quo that disruptive change could jeopardize public safety for the sake of higher

profits. Interestingly, every company and industry that was eventually disrupted has had supporters who at one time lobbied against change and argued that disruptive enterprises could never offer more than substandard performance and unacceptable quality.

The firms that grew to become successful under specific regulatory conditions subsequently worked very hard to make sure that those conditions remained in their favor. It wasn't very long ago that General Motors lobbied for increased tariffs and quotas on Japanese imports, arguing before Congress, "What's good for General Motors is good for America."

However, although often written with good intentions, these regulations unintentionally trap health care in high-cost models of care. For example, many states do not allow nurses to interpret simple test results or write basic prescriptions, leaving care delivery to be performed by physician-staffed solution shops. This makes sense for complex illnesses that require the intuition of experts, but such regulations leave no room for value-added process businesses such as nurse-staffed retail clinics that can deliver better and more cost-effective care for a growing list of conditions. Health care policymakers must recognize the hidden cost of supporting and renewing regulations that inhibit innovation over the long run.

■ **Reimbursement.** Finally, returning to our original premise that it is a mistake to focus only on cutting costs when trying to fix the health care system, regulators and payers often direct their attention to cutting reimbursement rates as the primary solution. However, cutting reimbursement in an attempt to force the solution-shop business models of hospitals and physician practices to somehow figure out a way to become more efficient does little to improve health care delivery. With lower reimbursement, hospitals and physicians struggle even more to fulfill their value propositions of providing complex, inherently expensive medical care, and they become even less inclined to hand off work to value-added process businesses.

AS WE HAVE TRIED to emphasize in this paper, the appropriate solution is to encourage the development of disruptive business models that can assume a greater share of the workload—not to force the old models of solution-shop medicine, successful in their own right, to twist and conform. By coupling technological advances with appropriately matched business models, disruptive innovation has brought affordability and accessibility to industries ranging from steel making to personal finance, and it is the right prescription for the ailing U.S. health care system—a treatment that is desperately needed and long overdue.

.....
This work was supported in part by a grant from the California HealthCare Foundation.

NOTES

1. For details about the research that underlies the theory of disruptive innovation, see C.M. Christensen, *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail* (Boston: Harvard Business School Press, 1997).
2. C.B. Stabell and Ø.D. Fjeldstad, "Configuring Value for Competitive Advantage: On Chains, Shops, and Networks," *Strategic Management Journal* 19, no. 5 (1998): 413–437.
3. For further discussion about the value of focus, see R.E. Herzlinger, *Market-Driven Health Care: Who Wins, Who Loses in the Transformation of America's Largest Service Industry* (Reading, Mass.: Addison-Wesley, 1997), 157–199.

Copyright of Health Affairs is the property of Project HOPE/HEALTH AFFAIRS and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.