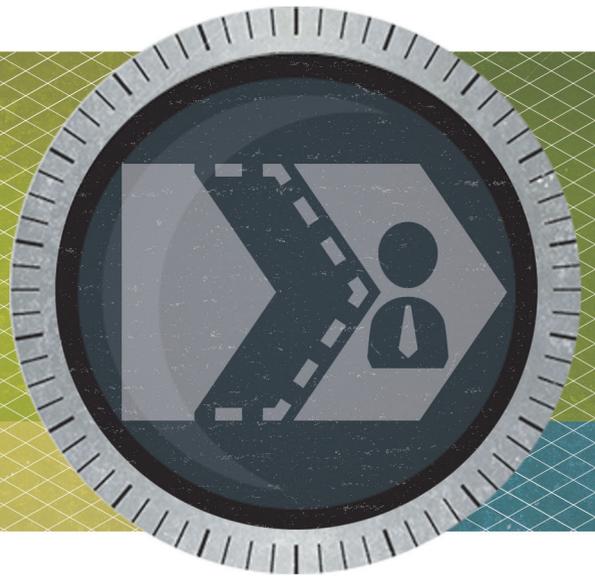


Shorten the value chain

Transforming the stages of value delivery



A pattern study from the Center for the Edge's
Patterns of Disruption series



Deloitte Consulting LLP's Strategy & Operations practice works with senior executives to help them solve complex problems, bringing an approach to executable strategy that combines deep industry knowledge, rigorous analysis, and insight to enable confident action. Services include corporate strategy, customer and marketing strategy, mergers and acquisitions, social impact strategy, innovation, business model transformation, supply chain and manufacturing operations, sector-specific service operations, and financial management.

Contents

Overview		2
Case studies		8
Is my market vulnerable?		17
Endnotes		18
Contacts		20
Acknowledgements		20
About the authors		21
About the research team		22

Overview

Shorten the value chain

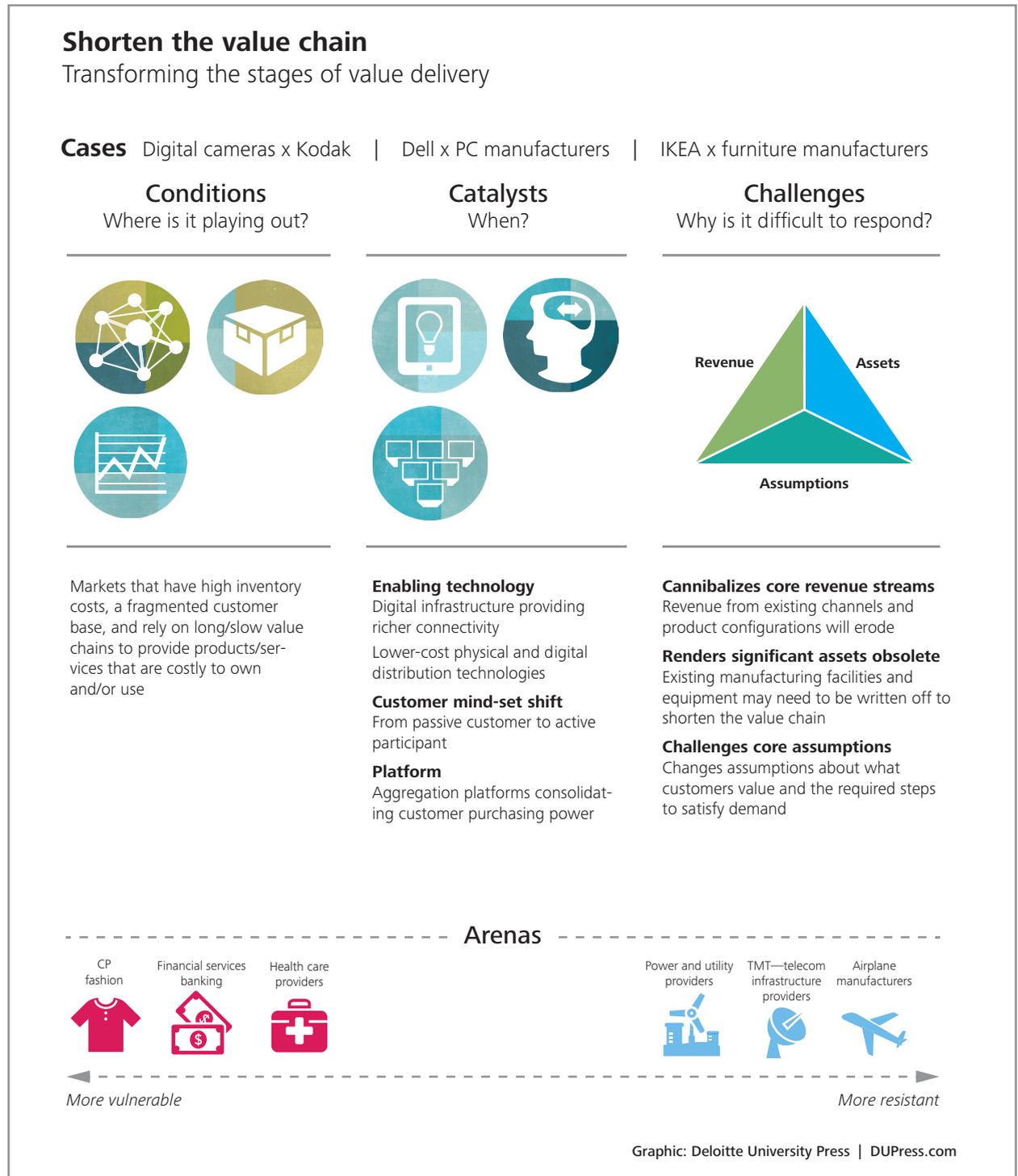
Transforming the stages of value delivery

Def. Restructure the value chain to provide significant benefits to the customer by removing or shifting stages.

Long-standing value chain models are being transformed by new entrants who restructure the way value is delivered to the customer. Digital and other technological innovations help new entrants eliminate or shift stages in the design, manufacture, commercialization, distribution, and support of products to create and capture new value. The large amounts of capital and infrastructure required for longer and more complex value chains are no longer required when significant stages are eliminated or shifted to different participants in such a way that the economics are dramatically changed. Incumbents with longer value chains provide ample targets for new entrants to reconceive how, when, and by whom value is created and delivered.

In the report *Patterns of disruption: Anticipating disruptive strategies in a world of unicorns, black swans, and exponentials*, we explored, from an established incumbent's point of view, the factors that turn a new technology or new approach into something cataclysmic to the marketplace—and to incumbents' businesses. In doing so, we identified nine distinct patterns of disruption: recognizable configurations of marketplace conditions and new entrants' approaches that can pose a disruptive threat to incumbents. Here, we take a deep dive into one of these nine patterns of disruption: **shorten the value chain**.

Figure 1. Pattern snapshot



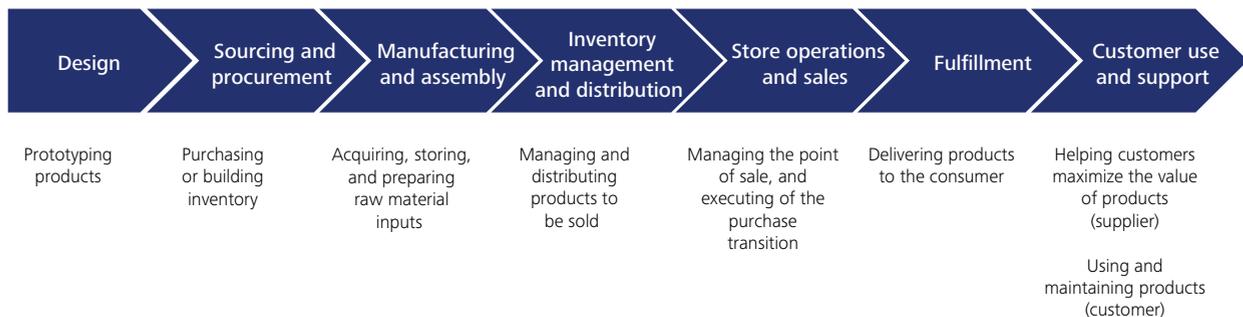
The term “value chain” was coined by Harvard Business School professor Michael Porter in 1985 to describe the set of activities performed to design, produce, market, deliver, and support products (figure 2).¹ While a supply chain is oriented around the flow of inputs and outputs from raw materials to finished goods, a value chain is oriented around the generation of value for the customer, as defined by the customer. Supply chain efforts will tend toward integrating processes and improving efficiency in ways that incrementally reduce costs or risks for the company. Value chain restructuring in the context of this pattern, on the other hand, focuses on how new approaches might be used at each stage to meet evolving customer needs in significantly different ways in order to deliver greater value to the customer.² The new arrangement of stages and participants can create additional value (for example, timeliness or insight) for the customer and the producer beyond the incremental cost savings derived from having fewer steps or shifting work to other participants.³

In long or complex value chains, the ability to understand and swiftly respond to changing customer preferences is limited. In the

past, high barriers to entry in many industries left customers with few options. Long value chains developed to optimize value within the cost imperatives for scale and standardization. But, in a world where information flows freely, product lifespans are collapsing, and consumers value products that better meet their needs, even if, or in some cases especially if, they have to interact directly with providers, this is beginning to change. Enabling technologies and changing customer behaviors allow new entrants to remove low-value stages or shift stages to different types of participants and seize economic benefits for themselves and their customers.

Across industries, technological advances are allowing responsibility for significant parts of the value chain to be transferred or shifted to different participants. Digital technologies, capabilities, and infrastructure provide for richer connections among value chain participants and with consumers. As a result, products move from idea to market faster, and the distinction between participants (such as manufacturer and retailer) blurs as activities such as design, financing, marketing, and fulfillment are done in new ways. For example,

Figure 2. A typical value chain



Graphic: Deloitte University Press | DUPress.com

“[W]e can’t do it alone. Our business idea is based on a partnership with the customer. First we do our part . . . then you do your part. . . . So together we save money.”

—IKEA⁴

many of today’s hardware startups are using social media and digital platforms such as Kickstarter to connect directly with customers, building affinity for both product and company. In parallel, innovations such as 3D printing and on-demand fulfillment reduce or can even eliminate the need to invest in inventory, further shifting the economics of the value chain and lowering the barriers to competition. For example, by releasing a few limited-edition designs every week for preorder, San Francisco clothing startup BetaBrand receives constant demand data and reduces the risks and costs of carrying excess inventory.

Customers are also participating more actively across the value chain stages, often with the promise of lower prices or more influence and control in exchange for greater ownership. In addition, aggregation platforms such as the product-enthusiast startup Massdrop, by consolidating demand and increasing customer purchasing power, make it easier for customers to bypass portions of the value chain.

New entrants who shorten the value chain may challenge markets that rely heavily on intermediaries (for example, third-party wholesalers) or complementary products. In some cases, new product technology allows the value chain to be restructured such that stages are consolidated or removed entirely,

eliminating the need for the complementary products that went with that stage. For example, the emergence of digital camera technology removed formerly crucial steps from the value chain, such as film developing and print making, and the need for the products and participants that accompanied those steps.

When shortening the value chain reduces costs—for instance, as a result of eliminating an entire stage or reducing the use of middlemen or the need to hold inventory—new entrants may pass on a portion of the cost savings to further strengthen customer relationships and increase their competitive advantage. For example, in the case of customer support being shifted to a customer-driven forum, customers derive value from getting more relevant product assistance and also benefit from not having to buy expensive support packages. Digital marketplaces are another example where new entrants have significantly streamlined or eliminated inventory management, store operation, or distribution stages in a way that adds new value for fragmented customers who have limited buying power. Meanwhile, for manufacturers or retailers, direct customer relationships help them to be more responsive to changing customer needs (like Dell in the PC market) and also to better sense and satisfy customer preferences shifting toward personalization and co-creation. Markets in which

customers are required to re-purchase, refill, and replenish are vulnerable to more direct and less costly options.

For incumbents that are challenged by a new entrant operating a significantly restructured value chain, replicating the new value chain may be difficult. Incumbents that are optimized for the economics of a longer value chain will likely experience eroding revenue from their existing channels and product configurations. Yet, if an incumbent tries to shorten the value chain by going direct to the customer, large capital investments in infrastructure (IT systems, trucks, warehouses, and distribution centers) that supported inventory build-up and transfer in a retail channel model may become obsolete and have to be written down. Other manufacturing assets designed for larger batches and longer life-cycle products might also have to be written down. Further, such a move could anger the channel that the incumbent depends on for perhaps several revenue streams, a concern for companies like HP when it tried to respond to Dell's direct-to-customer model. But when demand is volatile and product life cycles are shorter,

compact value chains are able to more rapidly adjust to meet shifting customer preferences. New entrants are often able to capture market share as they challenge fundamental ways of doing business and the core assumptions behind what customers value, where that value is created, and the arrangements that dictate how it is captured.

Across industries, advances in digital or manufacturing technologies and shifting customer mind-sets may create opportunities for new entrants to shorten the value chain. New entrants experimenting with blockchain technology⁵ may discover further opportunities for removing significant parts of the value chain built around validation, tracking, clearing, and risk mitigation. Shortening the value chain has already disrupted leading incumbents in some arenas, including retail furniture and technology consumer products. Others, especially those with long or complex value chains that have high costs relative to the value created or that have lagged in technology-driven change, may be vulnerable. For instance, health care providers may be at risk in the future as developments in telemedicine continue to improve customer relationships and reduce relatively high costs of care. On the other side of the spectrum, the limited number of players in the airplane manufacturing industry, and the low number of stages in a SaaS value chain are likely to make them more resistant to disruption by this pattern.

Key stats

- In 1980, Kodak employed over 120,000 workers worldwide; by 2010, the company employed fewer than 30,000.⁶
- In 1998, 86.6 percent of Dell's PC sales came through the direct channel, while only 4.4 percent of Compaq's and 0.6 percent of HP's PC sales came through the direct channel.⁷

Digging deeper



Isn't shortening the value chain the same as supply chain management?

Supply chain management focuses largely on optimizing efficiency, often through incremental changes in the physical movement and management of materials from raw supply to finished product available to the customer. This is an important and well-established area of practice that companies need to remain profitable and competitive while ensuring continuity in a global business environment. Shortening the value chain fundamentally changes the economics of value creation in a market by eliminating or shifting stages of the value chain. Radical supply chain management activities can also change the economics in a market; however, this pattern is concerned with changes related to shifting or eliminating significant stages of the value chain. Shortening the value chain, in effect, is broader and more transformative than supply chain optimization, and is driven by innovations in product development and customer engagement.⁸

Does vertical integration shorten the value chain?

Vertical integration merges businesses that are at different stages of production—for example, a brewing company and a barley producer or a brewing company and a restaurant chain. Companies such as Warby Parker (eyeglasses), Bonobos (men's apparel), and J. Hilburn (men's apparel) have garnered attention as innovators in customer responsiveness, in part, by embracing vertical integration, but vertical integration has been standard in industries, such as oil since the 1970s, and has come in and out of fashion in other industries, such as PC manufacturing.⁹

Vertical integration can be a form of shortening the value chain to the extent that it removes significant stages from the value chain or shifts them to a new type of participant in a way that changes how value is created and captured. Traditionally, however, vertical integration strategies have been more focused on ensuring continuity and quality of supply, as well as eliminating external pricing markups. To the degree that vertical integration does restructure the value chain, it can be a difficult and expensive strategy, while the streamlining of operations that accompany it potentially limit a company's ability to offer customized products for niche demand.

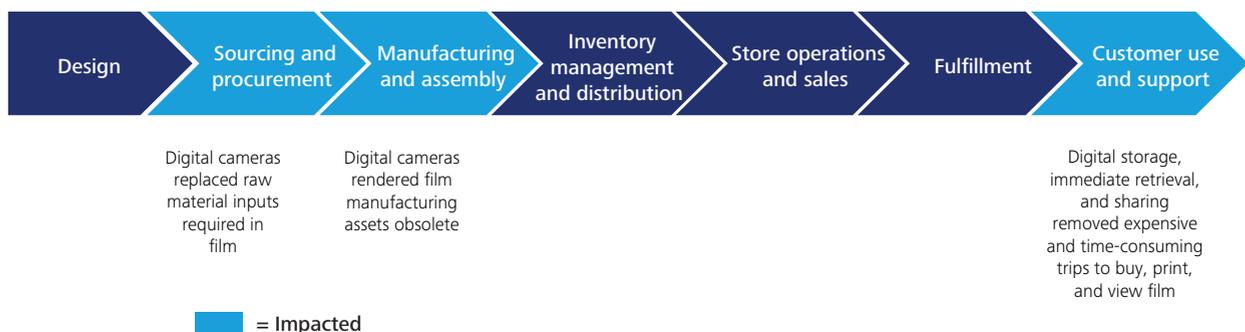
Case studies

Digital cameras displace Kodak

Kodak's disruption isn't breaking news, but in order to understand the dynamics of the patterns, we needed to examine, in detail, cases of displacement that had already played out; by definition, such proven cases of disruptions require looking backward and reexamining well-trod ground under a new lens.

First prototyped at Kodak in the 1970s, digital cameras permanently changed the consumer photography market when they were widely adopted in the early 2000s. Digital cameras eliminated film from the photography value chain and drastically decreased both the time and the steps required for consumers

Figure 3. The impact of digital on the consumer photography value chain



Graphic: Deloitte University Press | DUPress.com

“Wise businesspeople concluded that it was best not to hurry to switch from making 70 cents on the dollar on film to maybe five cents at most in digital.”

—Larry Mateson, former Kodak executive¹¹

to capture, store, view, and share images. By eliminating all of the time lag between taking a picture and viewing the image, LCD-equipped digital cameras also improved upon the vexing problem of missed and poor-quality shots. While customers benefited from the new value digital cameras delivered, this new value chain led to the demise of Kodak, which had controlled 90 percent of the film market in 1976 and was rated as one of the world’s five most valuable brands thanks in large part to its film business.¹⁰

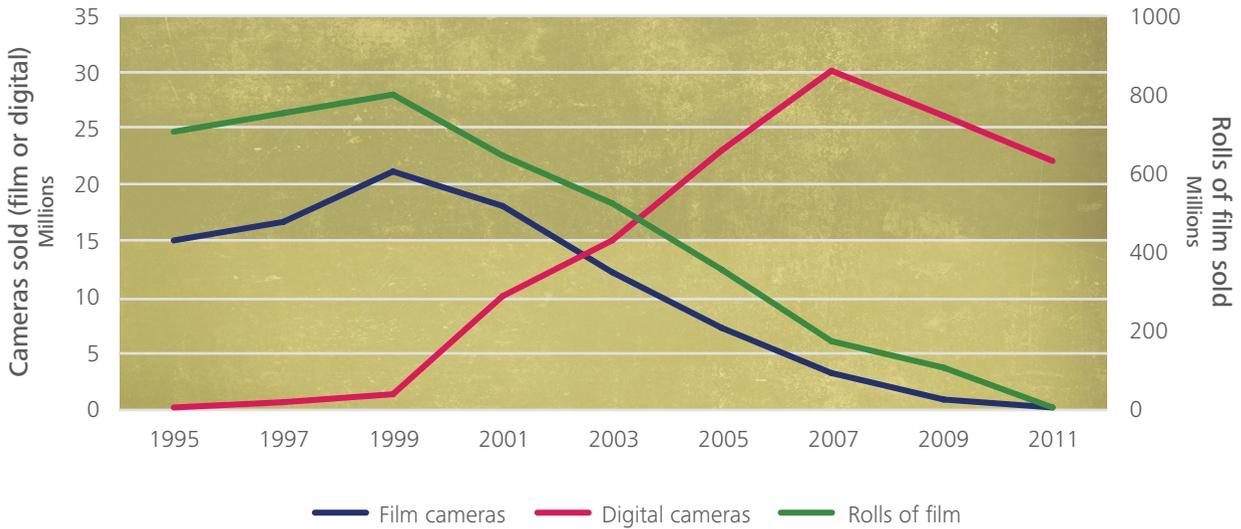
The outlook for Kodak’s core film business changed quickly toward the end of the 1990s with the introduction of consumer-grade digital cameras (by Kodak as well as competitors such as Nikon, Sony, and Canon) that had better form function, LCD screens for previewing pictures, greater image resolution, and storage systems that were compatible with the evolving PC technologies. Prior to digital cameras, consumers had to purchase and load film (or purchase a pre-loaded camera), take pictures, pay development fees, and wait, at a minimum, several hours and often days or weeks, to actually see their pictures developed and printed, and display and share the physical prints; now they could take pictures, store them on a memory chip instead of on film, and view them immediately. It also signaled a new approach to viewing and sharing photographs in general. Eventually, digital cameras offered not just higher quality, but more

storage space and easier transfer to other formats and devices. These features provided a more convenient and cost-effective path for consumers using the Web and mobile devices, which consumers began to greatly prefer, and it coincided with the rapid improvement in and adoption of digital technology and infrastructure in daily life.

Global sales of film cameras slipped from 20 million units in 2000 to 5 million only six years later,¹² while sales of digital cameras increased from 2.5 million to 20.4 million units over that same period.¹³ This shift happened so quickly that, for example, a film camera that Kodak introduced in 2004 was named “camera of the year,” yet was discontinued by the time Kodak collected the award.¹⁴

Kodak had the capabilities and insights to successfully transition to digital¹⁵ and as the *Economist* recently wrote, “A report circulated among senior executives in 1979 detailing how the market would shift permanently from film to digital by 2010.”¹⁶ Kodak evaluated options and prepared for the transition by investing in various web-based photo-sharing companies, such as Snapfish, and filing or acquiring patents—by 2012, it held over 1,100 digital imaging and processing patents.¹⁷ Yet, with the financial outlook for transitioning to digital murky, the company chose to stick with its strength and focused on selling superior film-based products. As Larry Mateson, a former Kodak executive put it, “Wise businesspeople

Figure 4. US photography market



Source: Jake Nielson, "Story of Kodak: How they could have saved the business," *The Innovative Manager*, August 2014, <http://www.theinnovativemanager.com/story-of-Kodak/>, accessed November 24, 2015.

Graphic: Deloitte University Press | DUPress.com

concluded that it was best not to hurry to switch from making 70 cents on the dollar on film to maybe five cents at most in digital.¹⁸ Thus, Kodak consciously chose to focus on bolstering the film business that had elevated it to one of America's iconic brands, assuming that once digital took off, Kodak would be able to join the market.

The shift away from film image-storage and processing had devastating effects on Kodak's film business and a variety of film processing products that Kodak sold for development. The industry transition had Kodak stuck in its tracks—a shift to digital would have cannibalized revenue streams from its core business (film, paper, chemicals), which accounted for 61 percent of sales.¹⁹ In addition, transitioning to a digital model would have rendered a long

list of film and film processing chemicals and paper manufacturing assets obsolete. Kodak was also uncertain of how customers would respond to viewing pictures on a screen, and assumed it could gradually shift to digital in the future. As a result of the new shorter value chain for digital and not otherwise adapting effectively to changing customer demands, the company's sales shrunk from \$16 billion in 1999 to \$10.3 billion in 2007 and \$6.2 billion in 2011.²⁰ Film represented a major component of this decline: In the two years between 2003 and 2005, the revenue for Kodak's core business fell from 61 percent to 36 percent of its revenues.²¹ While the absolute number of photo prints were increasing, cheaper printing options, such as home and office printing where Kodak didn't have a strong presence, were gaining

popularity. By 2006, Kodak's film sales were down 75 percent from 1999, and Kodak was focused on the booming mass-market digital camera industry.²²

Kodak experienced short-lived success with digital cameras but could not sustain its position in a market that would soon be decimated by the smartphone. While Kodak's financial decline from 1999 to 2007 is attributable to the failure to create and capture value in the new digital value chain, the further drop in the next several years can be attributed to a different pattern, *converge products*, epitomized by the rise of the camera-equipped smartphone, which eliminated the need for the low-end

digital cameras that Kodak (and its competitors) provided. Meanwhile, Fujifilm, which was often thought of as Kodak's Japanese equivalent due to its near monopoly of the film market in Japan, was able to diversify more successfully (including by entering the cosmetics market), discovering new outlets for its film expertise (for example, optical films for LCD flat-panel screens), and finding other revenue sources and branding opportunities (for example, a joint venture with Xerox).²³

Digital had arrived at an unexpected pace, and Kodak was too slow to redefine its position in the new value chain.²⁴

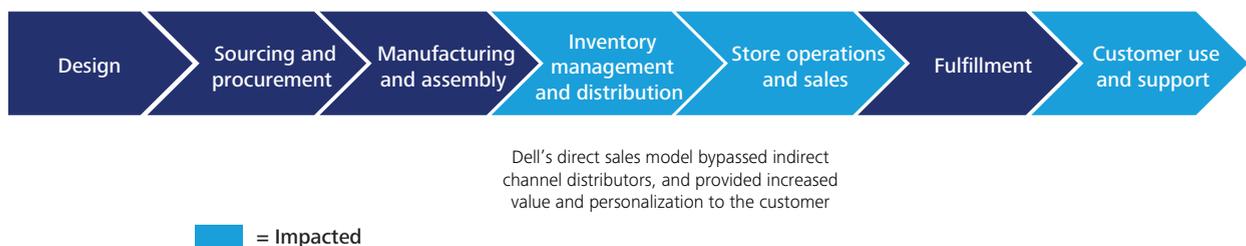
Short story

Dell displaces US PC incumbents Compaq, Packard Bell, and IBM in the late 1990s

In 1995, Dell held the sixth-highest market share in the US personal computer (PC) industry. But, through a business model and sales strategy that bypassed distributors and value-added resellers who were a major part of the PC value chain, the company that originated in a dormitory room displaced PC incumbents Compaq, Packard Bell, and IBM by 2000.²⁵ Dell's direct sales model increased customization, affordability, and convenience for enterprise customers by offering a one-stop shop where it could build machines to customer specifications via a selection of memory boards, processors, and other components. Additionally, by implementing a direct sales model, Dell was able to dramatically reduce its channel costs. While under the direct model, channel costs represented 2 percent of product revenue, this figure jumped to 13.5–15.5 percent of product revenue for indirect sales.²⁶ Dell's differentiated strategic value chain helped increase its US revenue from \$360 million in 1990 to \$17.9 billion in 1999, making it the US market leader.²⁷

Former incumbents such as Compaq were unable to respond effectively. The majority of the major PC players had business models reliant upon selling through distributors and retailers, who threatened to discontinue business with them if they began selling directly to the enterprise. If carried out, this would be devastating to organizations like IBM, which earned over 90 percent of its sales from indirect channels.²⁸ Transition to a direct sales model would thus not only cannibalize major sources of revenue, but would also require the development of a complex delivery system, infrastructure, and in-house capabilities for services that resellers used to provide.²⁹ Dell had developed strategic and competitive cost advantages over 15 years by operating purely under a direct sales model, and thus restructuring sales strategies (such as Compaq's, which relied on a network of over 44,000 dealers) was far from simple for incumbents.³⁰ As a result, Dell emerged as the PC leader, with market share climbing from 3 percent in 1994 to nearly 18.5 percent by 2000, while competitors such as IBM lost almost half of their market share between 1994 and 2000.³¹

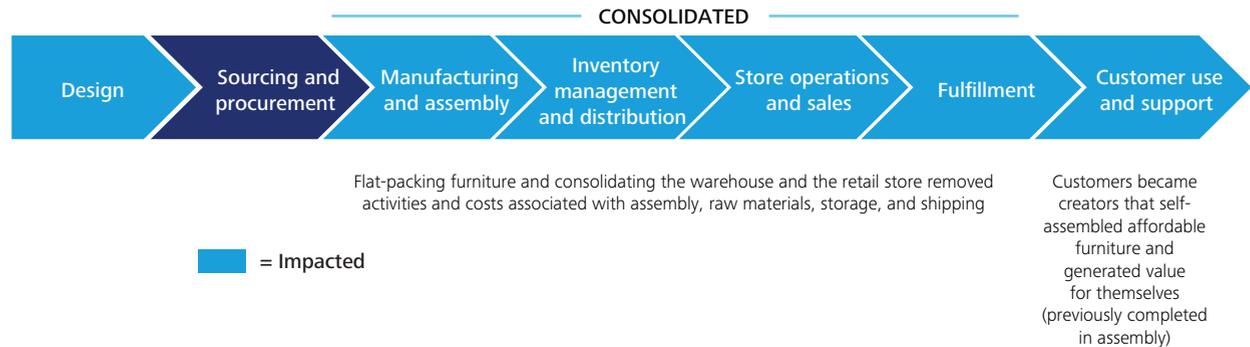
Figure 5. Dell's enterprise PC value chain



Graphic: Deloitte University Press | DUPress.com

IKEA disrupts US furniture retailers

Figure 6. IKEA's consumer furniture value chain



Graphic: Deloitte University Press | DUPress.com

When IKEA invented flat-packed furniture in 1956, it happened by accident. The story goes that the company stumbled into flat-packing when a designer took the legs off a Lovet table to fit it in his trunk before a photo shoot—the rest is history.³² What began as an accident has turned into the Swedish retailer's global dominance as IKEA became the furniture manufacturing world leader in 2002 and the US leader by 2010.³³ This simple discovery was the inspiration for a larger cascade of changes in which responsibility for multiple stages of the value chain, including in-store service and assembly, was shifted to the customer. Selling furniture as condensed, unassembled pieces has allowed IKEA to remove raw material, shipping, and storage costs, as well as eliminate the order-taking and fulfillment stages, and associated costs, from the typical furniture value chain. In the process, it has created a participatory experience for the customer and eliminated the typical lag that occurs between a customer picking out and ordering furniture and actually receiving it.

IKEA customers can pick out furniture in one of the company's hybrid retail warehouses, take it home, and put it together the same day.

IKEA offers customers more than just low prices—it has changed the model of how businesses interact with customers by cultivating a shift in customer mind-set from passive buyers to active participants, mobilizing customers to create product value. For those customers that choose to take on responsibilities such as self-guided in-store service and product assembly—tasks traditionally owned by manufacturers and retailers—IKEA delivers affordable, well-designed products.³⁴ This incentive was not only openly shared with customers (IKEA's website in 2004 stated that “if [customers] can do simple things like pick up [their] purchases and assemble them at home, we'll keep prices low”) but also strongly encouraged through the provision of childcare facilities, in-store restaurants, and a plethora of pencils, paper pads, and tape measures.³⁵ While these changes may appear subtle, in aggregate they fundamentally change the

furniture buying experience in such a way that is often difficult for competitors to replicate. IKEA shortened the value chain and “systematically reinvent[ed] its value and the business system that delivers it to the actors involved.”³⁶ Streamlining the process for furniture designs by setting the price tag and then designing, sourcing materials, and finding suppliers to fit that price also helped IKEA to reduce costs by 30 percent and pass those savings on to customers.³⁷

This new model has allowed IKEA to remove stages and participants from the value chain, and has generated significant cost savings not only for its customers, but also for its business. While flat-packing allows IKEA to ship six times more units per shipment than if it were to ship assembled furniture, it is only viable because of the reconfigured value chain that shifts significant stages to the customer.³⁸ Flat-packing has become so engrained in IKEA’s model that some consider “we don’t want to pay to ship air” to be IKEA’s mantra.³⁹ As a result of innovative delivery and customer engagement, by 2002, less than 20 years after entering the US market, IKEA had become the world’s largest furniture retailer with \$12 billion in global sales, thanks in large part to the reverberations of flat-packing throughout its value chain.⁴⁰

IKEA’s innovative value chain is shorter than that of most US furniture retailers.

Incumbents may hesitate to transition to an IKEA-like model for fear of pushing away customers that are unwilling to take on tasks that have traditionally been defined as a supplier’s responsibilities. Furthermore, shifting to a flat-packing model with combined warehousing and retail locations would require incumbents to significantly alter their current manufacturing, logistics, and retail infrastructure and processes and likely write off the assets

associated with the current systems.

While IKEA has thrived in the furniture market by transitioning assembly to customers, Ashley Furniture has made its mark through optimizing its supply chain—the company relentlessly looks for opportunities to remove costs from the supply chain by sourcing inventory from Asia and leasing the empty containers to grain farmers and other agricultural concerns serving export markets.⁴²

Since 2000, IKEA’s US market share has climbed

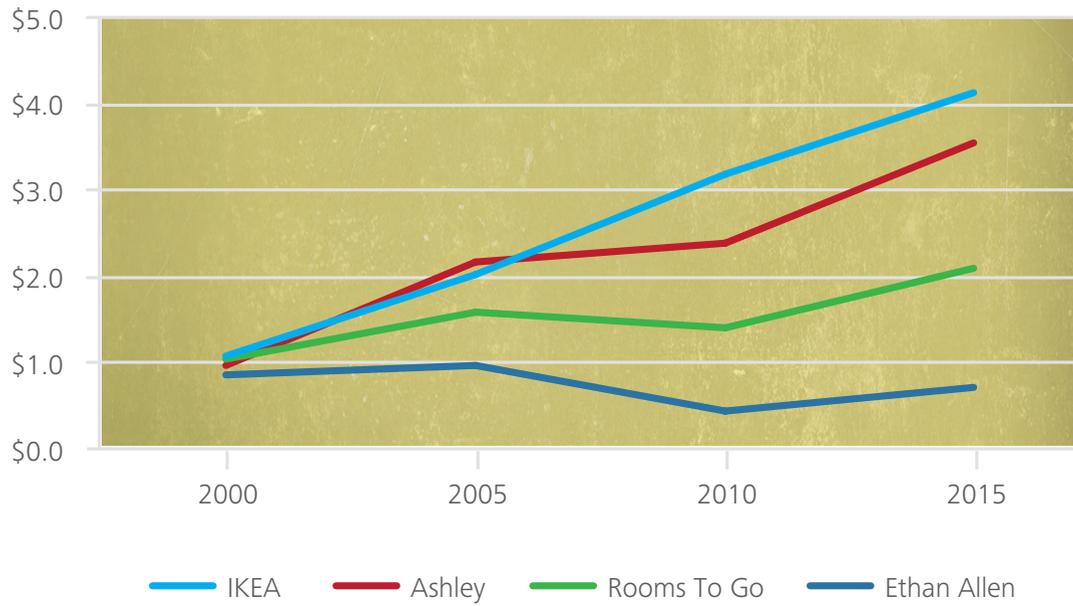
within a fragmented industry, taking market share from competitors like Ashley Furniture, Ethan Allen, and Rooms to Go. Even though the industry remains fragmented in the United States, IKEA’s business model has helped it capture 6.4 percent to lead the retail furniture market and \$4.1 billion in fiscal year 2015 in the United States alone.⁴³



“Be prepared. Make a list of anything you may need for your home.... Take measurements of spaces you want to fill with furniture. And be sure there’s room in your car. You’ll need it.”

—IKEA company website⁴¹

Figure 7. Top US furniture retailer sales (\$ billion)



Source: Deloitte analysis of third-party data.

Graphic: Deloitte University Press | DUPress.com

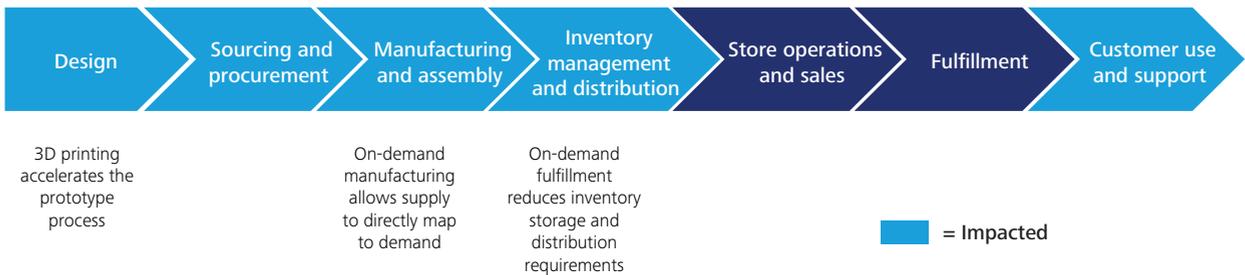
Short story

3D printing

3D printing is expected to transform the way we prototype and fulfill orders for manufactured goods. The typical manufacturing value chain involves many players facilitating the design, production, transportation, and warehousing of products and services. Some of these participants will likely be removed as more and more manufacturers adopt 3D printing. In order to remain relevant in a market with lessened warehousing and inventory requirements, many current leaders in the market will have to write off significant manufacturing equipment, capital, and tools investments and update their delivery models. Overall, 3D printing will likely continue to generate more value with fewer participants as traditional manufacturers and independent players may no longer be necessary for quick prototyping. 3D printing has the ability to remove the most costly and time-consuming steps in product development, which is why industries from food to medicine to military all have the potential to be transformed.⁴⁴

For example, Normal utilizes 3D printing for on-demand fulfillment, reducing manufacturing and raw material costs by investing only in products that have a demand. This New York-based startup 3D prints customized earbuds, selling products that customers covet and ultimately buy at half the price of its competitors, which require professional ear molds made by audiologists.

Figure 8. 3D printing value chain



Graphic: Deloitte University Press | DUPress.com

Is my market vulnerable?

Are there a significant number of stages in my value chain?

Markets with extended value chains that have a relatively high number of stages are often more vulnerable to disruption. This is because long value chains imply that incumbent suppliers, producers, or designers may be several steps removed from the customer, and thus receive less insight into customer needs and market dynamics. Long value chains additionally may be slower to respond to changing customer preferences because of the high number of inputs and coordination across parties that will be required to address any changes. Conversely, value chains with few stages will be able to swiftly adapt and adjust to customer demands and preferences.

Do I rely on third parties or complementary product offerings to deliver value to customers?

Businesses that have a heavy reliance on intermediaries or other products are vulnerable to changes in their ecosystem that are out of their control. If a complementary product or intermediary exits the market, expands capabilities, or renders a portion of the value chain obsolete, incumbents may find themselves unable to compete in the market. Conversely, businesses that are fully independent control their own place within the market, can more swiftly adapt to changes in customer needs, and are able to adopt new technologies with less resistance.

Does my product/service have a high lifetime total cost of ownership?

When products or services have high costs of ownership, customers with low switching costs will be eager and inclined to look for cheaper alternatives. Entrants may be able to capitalize on this by addressing one of the many factors behind high prices. These include price mark-ups to cover incremental costs added through several steps or parties of the value chain (for example, inventory, manufacturing, design), or high post-purchase costs in the form of replenishing, re-purchasing, or refilling. When new players are able to decrease costs by removing steps or players from product creation through consumption, offerings become enticing to buyers.

Is my customer base fragmented with a low degree of buying power?

If a market's customer base is fragmented and holds low buying power, new entrants may be able to capitalize through deploying streamlined purchasing methods that bypass portions and players within the old value chain. Aggregating customer demand is beneficial for customers in the form of easy access and discounts through high-quantity purchases. Suppliers that capitalize on aggregation platforms and other methods to understand customer demand have a leg up on incumbents with high inventory costs, and can pass on some of the savings to customers.

Endnotes

1. Michael E. Porter, *Competitive Advantage: Creating and Sustaining Superior Performance* (New York: Free Press, 1998), p. 33.
2. Andrew Feller, Dan Shunk, and Tom Callarman, "Value chains versus supply chains," *BPTrends*, March 2006, <http://www.ceibs.edu/knowledge/papers/images/20060317/2847.pdf>, accessed November 24, 2015.
3. *Harvard Business Review*, "HBR on managing the value chain," Harvard University Press, 2000, p. 183, accessed November 25, 2015.
4. *Harvard Business Review*, "IKEA invades America," Harvard University Press, 2004, accessed November 25, 2015.
5. The applications for blockchain technology are still nascent. Its potential to enable disruption versus drive operational efficiency for incumbents will vary by industry and application. We discuss a particular way in which blockchain can be disruptive in another pattern, *connect peers*. For further discussion of blockchain, please see David Schatsky and Craig Muraskin, *Beyond bitcoin*, Deloitte University Press, December 2015.
6. "The last Kodak moment?" *Economist*, January 2012, <http://www.economist.com/node/21542796>, accessed November 24, 2015.
7. *Harvard Business Review*, "Matching Dell," Harvard Business School, June 1999, accessed November 25, 2015.
8. Feller, Shunk, and Callarman, "Value chains versus supply chains."
9. "Vertical integration," *Economist*, March 2009, <http://www.economist.com/node/13396061>, accessed November 24, 2015.
10. "The last Kodak moment?" *Economist*.
11. Ibid.
12. Jordan Crook, "What happened to Kodak's moment?" *TechCrunch*, January 2012, <http://techcrunch.com/2012/01/21/what-happened-to-kodaks-moment/>.
13. Giovanni M Gavetti, Rebecca Henderson, and Simona Giorgi, "Kodak and the digital revolution (A)," *Harvard Business School Case Collection*, November 2004 (revised November 2005), accessed December 2, 2015.
14. Paul B. Carroll and Chunka Mui, *Billion Dollar Lessons: What You Can Learn from the Most Inexcusable Business Failures of the Last Twenty-five Years* (New York: Penguin Group, 2008).
15. Nathan McAlone, "This man invented the digital camera in 1975 – and his bosses at Kodak never let it see the light of day," *Business Insider*, August 2015, <http://www.businessinsider.com/this-man-invented-the-digital-camera-in-1975-and-his-bosses-at-kodak-never-let-it-see-the-light-of-day-2015-8>, accessed November 24, 2015.
16. Matt Vella, "The Kodak lie," *Fortune*, January 2012, <http://fortune.com/2012/01/18/the-kodak-lie/>, accessed November 24, 2015.
17. Sarah Mitroff, "Kodak sells digital camera patents to Apple, Google, other tech giants," *Wired*, December 2012, www.wired.com/2012/12/kodak-patents/, accessed November 24, 2015; "Kodak invests in Snapfish," June 2000, <http://www.snapfish.com/athp/release6262000>, accessed November 24, 2015.
18. "The last Kodak moment?" *Economist*.
19. Carroll and Mui, *Billion Dollar Lessons*.
20. "Eastman Kodak Company 2008 annual report on form 10-K and notice of 2009 annual meeting and proxy statement," December 2008,

- https://bib.kuleuven.be/files/ebib/jaarverslagen/KODAK_2008.pdf, accessed November 24, 2015; “The last Kodak moment?” *Economist*; Peter Cohan, “How success killed Eastman Kodak,” *Forbes*, October 2011, <http://www.forbes.com/sites/petercohan/2011/10/01/how-success-killed-eastman-kodak/>, accessed November 24, 2015; Statista, “Kodak’s global revenue from 2005 to 2013,” <http://www.statista.com/statistics/277061/kodaks-global-revenue-since-2005/>, accessed December 2, 2015.
21. Digital Photography Review, “Kodak’s digital sales overtake film,” January 31, 2006, <http://www.dpreview.com/articles/6085531672/kodaksales>, accessed December 2, 2015.
 22. “Eastman Kodak Company annual report 2000,” December 2000, <https://www.kodak.com/US/en/corp/annualReport00/letter/letter.shtml>, accessed November 24, 2015.
 23. “How Fujifilm survived,” *Economist*, January 2012, <http://www.economist.com/blogs/schumpeter/2012/01/how-fujifilm-survived>, accessed November 24, 2015; “The last Kodak moment?” *Economist*.
 24. Vella, “The Kodak lie.”
 25. Haim Mendelson, “Dell direct,” *Graduate School of Business Stanford University*, November 2000, <http://web.mit.edu/course/15/15.823/attach/Dell%20CASE.pdf>, accessed November 25, 2015.
 26. Ibid.
 27. Ibid.
 28. *Harvard Business Review*, “Matching Dell.”
 29. Mendelson, “Dell direct.”
 30. Gary Mcwilliams, “Mimicking archrival Dell, Compaq to sell its PCs directly,” *Wall Street Journal*, November 1998, <http://www.wsj.com/articles/SB910747884932316500>, accessed November 25, 2015.
 31. Haim Mendelson, “Dell direct.”
 32. “IKEA launches first flat-pack table,” *Dezeen Magazine*, July 2013, <http://www.dezeen.com/2013/07/22/ikea-revives-three-legged-diy-side-table/>, accessed November 24, 2015.
 33. *Harvard Business Review*, “IKEA invades America.”
 34. *Harvard Business Review*, “HBR on managing the value chain.”
 35. *Harvard Business Review*, “IKEA invades America.”
 36. *Harvard Business Review*, “HBR on managing the value chain.”
 37. *Harvard Business Review*, “IKEA invades America.”
 38. Ibid; Saarbiba Chaudhuri, “IKEA can’t stop obsessing about its packaging,” *Wall Street Journal*, June 2015, <http://www.wsj.com/articles/ikea-cant-stop-obsessing-about-its-packaging-1434533401>, accessed November 25, 2015.
 39. Chaudhuri, “IKEA can’t stop obsessing about its packaging.”
 40. *Harvard Business Review*, “IKEA invades America.”
 41. Ibid.
 42. “Supply chain news: Ashley Furniture keeps making many products in US, with push to succeed in China,” *Supply Chain Digest*, March 9, 2015, <http://www.scdigest.com/ontarget/15-03-09-1.php?cid=9078>, accessed December 3, 2015.
 43. Taylor Palmer, *Furniture stores in the US: 44211*, IBIS World, October 2015, accessed November 30, 2015
 44. Thomas Ehrlich and Ernestine Fu, “Our future with 3D printers: 7 disrupted industries,” *Forbes*, October 2013, <http://www.forbes.com/sites/ehrllichfu/2013/10/29/our-future-with-3-d-printers-7-disrupted-industries/>, accessed November 25, 2015.

Contacts

Blythe Aronowitz

Chief of staff, Center for the Edge
Deloitte Services LP
+1 408 704 2483
baronowitz@deloitte.com

Peter Williams

Chief edge officer, Centre for the Edge
Australia
Tel: +61 3 9671 7629
E-mail: pewilliams@deloitte.com.au

Wassili Bertoen

Managing director, Center for the Edge
Europe
Deloitte Netherlands
+31 6 21272293
wbertoen@deloitte.nl

Acknowledgements

This research would not have been possible without generous contributions and valuable feedback from numerous individuals. The authors would like to thank:

Philippe Beaudette
Andrew Blau
Peter Fusheng Chen
Jack Corsello
Larry Keeley
Eamonn Kelly
Vas Kodali
Jon Pittman

Janet Renteria
Peter Schwartz
Dan Simpson
Vivian Tan
Lawrence Wilkinson
Andrew Ysursa
Blythe Aronowitz
Jodi Gray

Carrie Howell
Junko Kaji
Duleesha Kulasooriya
Kevin Weier

About the authors

John Hagel (co chairman, Deloitte Center for the Edge) has nearly 35 years of experience as a management consultant, author, speaker, and entrepreneur, and has helped companies improve performance by applying IT to reshape business strategies. In addition to holding significant positions at leading consulting firms and companies throughout his career, Hagel is the author of bestselling business books such as *Net Gain*, *Net Worth*, *Out of the Box*, *The Only Sustainable Edge*, and *The Power of Pull*.

John Seely Brown (JSB) (independent co chairman, Deloitte Center for the Edge) is a prolific writer, speaker, and educator. In addition to his work with the Center for the Edge, JSB is adviser to the provost and a visiting scholar at the University of Southern California. This position followed a lengthy tenure at Xerox Corporation, where JSB was chief scientist and director of the Xerox Palo Alto Research Center. JSB has published more than 100 papers in scientific journals and authored or co authored seven books, including *The Social Life of Information*, *The Only Sustainable Edge*, *The Power of Pull*, and *A New Culture of Learning*.

Maggie Wooll (head of eminence and content strategy, Deloitte Center for the Edge) combines her experience advising large organizations on strategy and operations with her love of storytelling to shape the Center's perspectives. At the Center, she explores the intersection of people, technologies, and institutions. She is particularly interested in the impact new technologies and business practices have on talent development and learning for the future workforce and workplace.

Andrew de Maar (head of research, Deloitte Center for the Edge) leads the Center's research agenda and manages rotating teams of Edge Fellows, focusing on the intersections of strategy and technology in a world characterized by accelerating change. He has worked with a wide range of public, private, and non-profit entities to help executives explore long-term trends that are fundamentally changing the global business environment and identify high-impact initiatives that their organizations can pursue to more effectively drive large-scale transformation.

About the research team

This report and the Pattern write-up series would not have been possible without the hard work of our research team—colleagues who tracked down case studies and cheerfully dug for data and more data on the way to proving and debunking countless possible patterns.

Tamara Samoylova (former head of research, Deloitte Center for the Edge) led the Center's research agenda. Her particular interests include innovation and new growth opportunities, work environment redesign, and how technology and changing consumer preferences are reshaping the retail landscape.

Carolyn Brown (research fellow, Deloitte Center for the Edge) is interested in emerging technologies/innovations, disruption, organizational structures and approaches to innovation, and the impact of government on innovation and vice versa. Brown's consulting experience at Deloitte focused primarily on enterprise strategy for large government agencies, with an emphasis on new technologies such as telemedicine.

Leslie Chen (former research fellow, Deloitte Center for the Edge) is passionate about exploring disruptive innovation in a global context with a focus on emerging markets. As part of Deloitte Consulting LLP's Strategy & Operations practice, she worked on location strategy projects, helping companies determine where to set up their global operations. During her time at the Center, she conducted research to define patterns, and explored how these patterns manifest in international markets.

Andrew Craig (former research fellow, Deloitte Center for the Edge) is passionate about exploring the intersection of technology, design, and social science as a way to understand and influence the drivers of business change. At Deloitte Consulting LLP, he works in the Strategy & Operations practice, helping clients realize growth in the face of dramatic social and technological shifts. At the Center, his research and analysis included the maker movement, the collaborative economy, manufacturing, and macro trends that drive disruptive change.

Carolyn Cross (research fellow, Deloitte Center for the Edge) is interested in finding innovative ways for companies to establish lasting customer relationships and deliver seamless customer service. As a consultant in Deloitte Consulting LLP's Strategy & Operations practice, she has spent the past two years helping clients across a range of industries, including health care and insurance. Cross is passionate about the future of the food landscape as well as blending together business and community to empower small business and non-profit growth.

Austin Dressen (research fellow, Deloitte Center for the Edge) is a self-described catalyst. Although a traditionally trained historian and entrepreneur, he also serves as resident philosopher-in-training. He is interested in the interaction of human beings and machines in our old, new, and unimagined systems.

Brandon Lassoff (research fellow, Deloitte Center for the Edge) is passionate about customer and marketing strategy, particularly in developing cutting-edge and innovative customer engagement plans. As a consultant in Deloitte Consulting LLP's Strategy & Operations practice, he has spent the last three years working alongside leading high-tech and pharmaceutical clients, developing seamless customer experiences to address top CMO priorities.

Andrew Reeves (former research fellow, Deloitte Center for the Edge) is a consultant in Deloitte Consulting LLP's Strategy & Operations group. He has worked with clients across the technology, financial services, and health care industries, focusing on topics ranging from innovation and growth strategy to process optimization, operational redesign, and supply chain innovation. At the Center, Reeves primarily focused on understanding disruption with regard to the development of platforms for accelerated learning, sharing, and product development.

Jay Rughani (former research fellow, Deloitte Center for the Edge) is passionate about developing new technologies that help people enjoy a better quality of life. His interests span issues ranging from resource allocation to cyber security to climate change. Today, he spends his time building technology-driven solutions to improve outcomes and reduce costs within the health care system.

Max Zipperman (research fellow, Deloitte Center for the Edge) is passionate about emerging technologies and their potential impact on the future of business and society. His primary interests revolve around questions of how best to structure public policy in preparation for unprecedented issues resulting from exponential technologies. At Deloitte Consulting LLP's Strategy & Operations practice, he has helped large technology and insurance companies prepare for a dynamic future.

About the Center for the Edge

The Deloitte Center for the Edge conducts original research and develops substantive points of view for new corporate growth. The center, anchored in Silicon Valley with teams in Europe and Australia, helps senior executives make sense of and profit from emerging opportunities on the edge of business and technology. Center leaders believe that what is created on the edge of the competitive landscape—in terms of technology, geography, demographics, markets—inevitably strikes at the very heart of a business. The Center for the Edge’s mission is to identify and explore emerging opportunities related to big shifts that are not yet on the senior management agenda, but ought to be. While Center leaders are focused on long-term trends and opportunities, they are equally focused on implications for near-term action, the day-to-day environment of executives.

Below the surface of current events, buried amid the latest headlines and competitive moves, executives are beginning to see the outlines of a new business landscape. Performance pressures are mounting. The old ways of doing things are generating diminishing returns. Companies are having a harder time making money—and increasingly, their very survival is challenged. Executives must learn ways not only to do their jobs differently, but also to do them better. That, in part, requires understanding the broader changes to the operating environment:

- What is really driving intensifying competitive pressures?
- What long-term opportunities are available?
- What needs to be done today to change course?

Decoding the deep structure of this economic shift will allow executives to thrive in the face of intensifying competition and growing economic pressure. The good news is that the actions needed to address short-term economic conditions are also the best long-term measures to take advantage of the opportunities these challenges create.

For more information about the Center’s unique perspective on these challenges, visit www.deloitte.com/centerforedge.



Follow @DU_Press

Sign up for Deloitte University Press updates at DUPress.com.

About Deloitte University Press

Deloitte University Press publishes original articles, reports and periodicals that provide insights for businesses, the public sector and NGOs. Our goal is to draw upon research and experience from throughout our professional services organization, and that of coauthors in academia and business, to advance the conversation on a broad spectrum of topics of interest to executives and government leaders.

Deloitte University Press is an imprint of Deloitte Development LLC.

About this publication

This publication contains general information only, and none of Deloitte Touche Tohmatsu Limited, its member firms, or their related entities (collectively the "Deloitte Network") is, by means of this publication, rendering professional advice or services. Before making any decision or taking any action that may affect your finances or your business, you should consult a qualified professional adviser. No entity in the Deloitte Network shall be responsible for any loss whatsoever sustained by any person who relies on this publication.

About Deloitte

Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited, a UK private company limited by guarantee ("DTTL"), its network of member firms, and their related entities. DTTL and each of its member firms are legally separate and independent entities. DTTL (also referred to as "Deloitte Global") does not provide services to clients. Please see www.deloitte.com/about for a more detailed description of DTTL and its member firms.

Deloitte provides audit, tax, consulting, and financial advisory services to public and private clients spanning multiple industries. With a globally connected network of member firms in more than 150 countries and territories, Deloitte brings world-class capabilities and high-quality service to clients, delivering the insights they need to address their most complex business challenges. Deloitte's more than 200,000 professionals are committed to becoming the standard of excellence.

© 2015. For information, contact Deloitte Touche Tohmatsu Limited.