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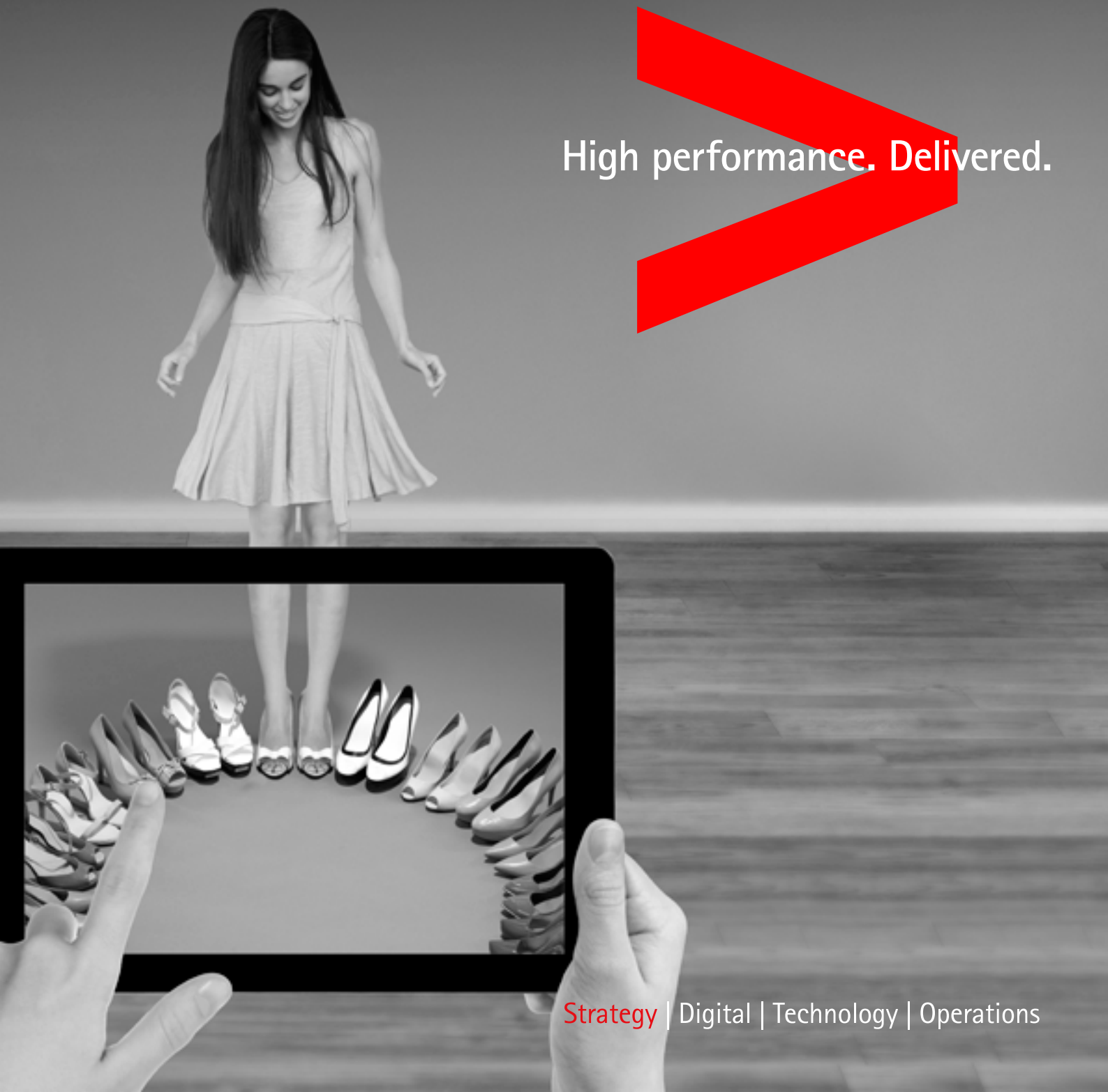
The Next Wave of Disruptors:
Five Game Changing Technologies for Retailers

By Jonathan Gregory



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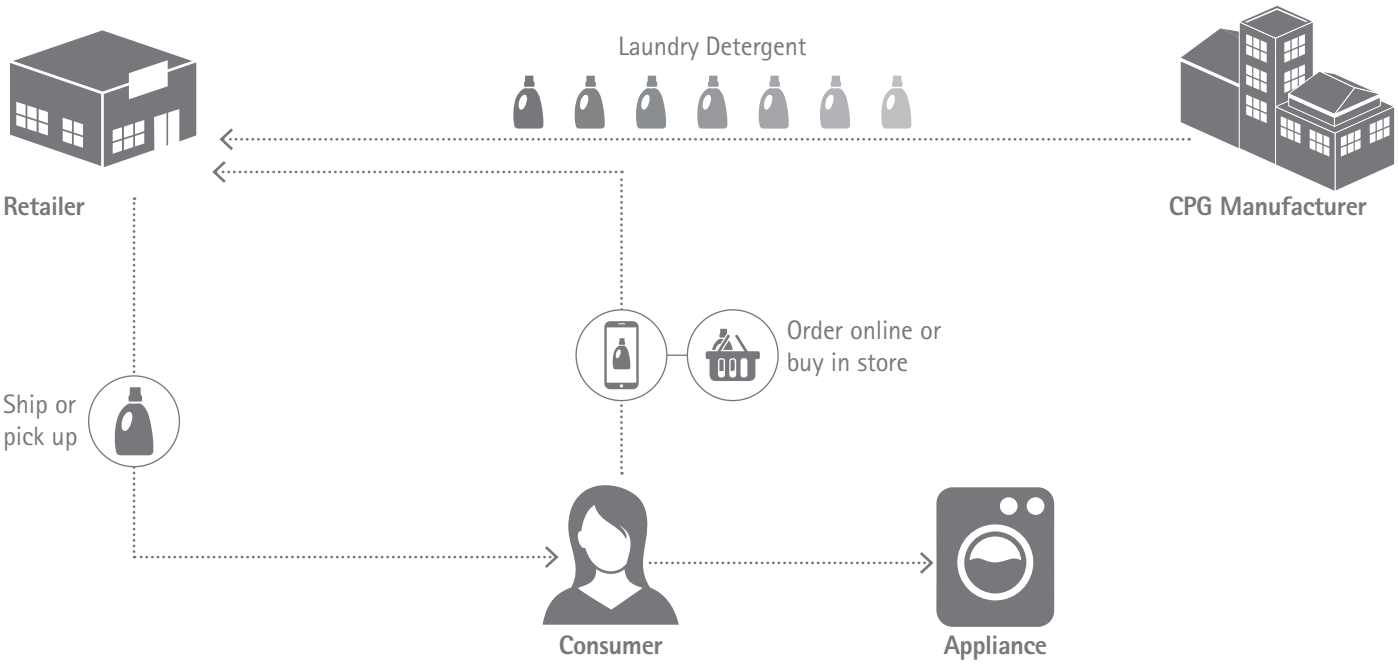
Technology disruptions often start small, but they can eventually gain enough power to crush the incumbents that lie in their path. When an upstart called Netflix began reshaping the supply chain for video rentals, first through mail order and then through online streaming, Blockbuster paid little attention—until it was too late. Blockbuster went from one of the largest video rental chains in the world in 2004 to bankruptcy six years later, and complete shut down in 2014.

Over the past decade, we've seen a steady state of similarly disruptive technologies, driven by advances in mobile computing, social media, and cloud-based services. What was once considered cutting edge, such as the ability to buy an item online and return it in-store, is now considered table stakes for any retailer hoping to remain relevant. Apple wasn't the first to digitize music, but it combined several technologies to make it easy for consumers to buy and access their music anywhere, anytime. Apple not only fundamentally changed the retail model for music, it made consumers think, Why can't all of my purchases be this simple?

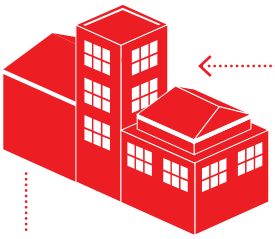
Retailers need to tap into these rapidly shifting consumer expectations by embracing the next wave of disruptions—or risk being flattened by it. A good place to start: Identify the emerging technologies that are most likely to disturb retail value chains. There are several disruptors on the horizon. A new generation of wearable computing devices and 3D printers opens up new opportunities for retailers to revolutionize every aspect of their operations. The combination of mobile computing and big data analytics are enabling more direct connections with consumers. Retailers as diverse as Macy's[1] and GameStop[2] are already beginning to deploy location-based "beacon" technology in stores, for example, providing shoppers in or near their stores with access to location-specific deals or other promotions via smartphone apps.

1 http://www.macrumors.com/2014/09/15/macys-shopkick-apple-pay/
2 http://www.mobilecommercedaily.com/gamestop-tackles-showrooming-via-beacon-tech

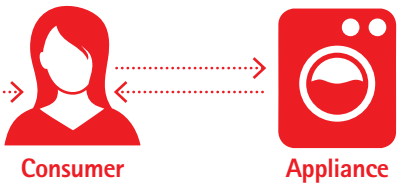
TODAY: OLD Value Chain



TOMORROW: NEW value chain



CPG Manufacturer
CPG Manufacturers are able to personalize and tailor their products to the individual's needs, preferences and use habits



Wearables
Clothes communicate their status (how dirty they are, skin conditions of the person, etc.) directly to the washing machine which prepares itself for the upcoming jobs

Cognitive Computing and Machine Learning
Washing machine learns and adapts to consumption patterns and optimizes the use of detergent

Internet of Things
Washing machine indicates and communicates it is low on detergent

Digital Fabrication
The washing machine becomes a digital fabricator and makes the most effective detergent based on user's patterns

Digital Payments
Direct-to-consumer channel for the detergent's manufacturer is enabled by digital payments

With such a rapidly evolving digital landscape, it's not enough for retailers to be looking at how technology innovation is disrupting their businesses today. They also need to be gazing into the future to understand—and begin planning for—the next wave of game-changing technology.

Here are five categories of emerging technologies that have already begun to demonstrate their disruptive powers across industry.

1. Internet of Things (IoT)

Intelligent devices—from shipping containers to shopping carts—are already a part of our daily lives and expected to continue to grow at an accelerated pace.

This collection of connected devices, known as the Internet of Things, offers significant opportunities for retailers to make their operations more efficient by connecting and automating elements of existing supply chain, inventory, logistics and fleet management systems.

For example, smart stores with connected devices and sensors will give retailers a better understanding of consumers' in-store behavior to help them optimize marketing, merchandising and operations. Hugo Boss is using heat sensors to track customer traffic in its clothing stores, which helps managers place premium products in high-traffic areas. Premium chocolate brand Godiva installed smart meters in its stores to count shoppers, which helps the company optimize staffing levels and measure the interest in its window displays.[3] Mondelez International is working with grocers to create "smart shelves" that use image sensors to capture basic demographic information from customers as they wait in checkout lines and offer targeted promotions.[4]

But the IoT also unleashes a looming threat to retailers. As demonstrated in Figure 1, it's easy to imagine a washing machine that communicates directly with the detergent manufacturer when its levels are low. The detergent manufacturer gains much richer consumption data than ever before, pushing retailers further out of the value chain.

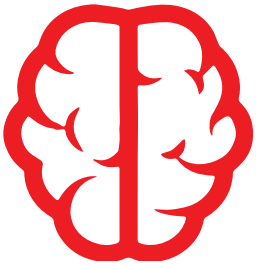
2. Wearables

There's no shortage of buzz around wearable computing devices. Ownership of consumer wearables–intelligent eyeglasses, watches, footwear, apparel—is expected to double year over year by 2016.[5]

Wearable devices that complement a person's actions allow companies to equip their employees with the technology they need to do better work, potentially improving operational efficiency. In retail, wearable devices such as Google Glass could help store employees look up product information in real-time while interacting with customers.

As with the IoT, however, wearables present another opportunity for packaged goods companies to forge direct interactions with consumers. As depicted in Figure 1, clothes could even become part of the broader IoT communication cycle. If an article of clothing can automatically indicate its status – such as how dirty it is, specific skin conditions of the wearer, or how full the clothing hamper is—the washing machine can automatically prepare for its upcoming jobs and utilize detergent in the most effective manner. Creating these types of personalized interactions with consumers could lessen CPG companies' reliance on retailers.

3 http://www.reuters.com/article/2013/11/15/retail-tracking-idUSL5N0IY3JL20131115
4 http://mashable.com/2013/10/16/mondelez-smart-shelves/
5 "The Internet of Things: The Future of Consumer Adoption," Acquity Group (an Accenture company), 2014



3. Cognitive Computing and Machine Learning

The software that empowers all of these connected devices is evolving in parallel. With an influx of big data—and advances in processing power, data science, and cognitive technology—software intelligence is helping machines to make informed "decisions."

Retailers need to understand the implications of increasingly intelligent software that will change the fundamental nature of application development and open up new windows of opportunity. Intelligent software plays a starring role in retailers' ability to harness big data, particularly unstructured forms such as video, images, symbols and natural language.

For example, augmented reality (AR) applications can overlay real-time integration of text, graphics, audio and other virtual enhancements onto screens and wearable devices displaying real-world objects. Some retailers are already experimenting with virtual dressing rooms and interactive "window shopping". Fashion retailer Uniqlo, for example, has piloted "Magic Mirror" technology from Sharp that allows customers to virtually change the colors of clothing they've tried on while standing in front of the mirror.[6] Adidas created a virtual shopping window at its NEO store in Germany that lets consumers drag products into a shopping bag on the window and download them to their smartphones, where they can complete the transaction using Adidas' e-commerce system.[7]

The ability of cognitive systems to analyze high volumes of structured and unstructured data to more accurately predict demand will help retailers make better merchandising decisions and create more efficient and tightly controlled supply networks.

Figure 1 shows both small and large threats that intelligent software brings to the retailer. For example, as a washing machine "learns" and adapts to consumption patterns, user needs, and optimal energy cycles, it will consume just enough detergent needed to get the job done. On the extreme end, as driverless cars become more common, the detergent manufacturer will have new, more affordable options for delivering products directly to consumers.

4. Digital Fabrication

The adoption of 3D printing is accelerating and poised for massive growth. Many retailers and manufacturers are already exploring ways to leverage 3D printing and other types of digital fabrication to defer production to the latest point possible in the supply chain to meet individualized demand.

The ability for shoppers to design and print their very own product (like eyewear) with a personalized fit and customized styles and colors has the potential to revolutionize the entire retail supply chain by enabling mass customization without the increased warehouse, storage and shipping costs. Retail brands are already testing new fulfillment models based on 3D printing. A consumer electronics startup, called Normal, designs and sells custom 3D printed earbuds from its Manhattan retail space, which doubles as a factory.[8] Staples has added 3D printing to its copy center services, enabling customers to create everything from phone cases to musical instruments.[9]

Because digital fabrication technology allows for much more personalized products to meet consumer needs, the washing machine shown in Figure 1 can become a digital fabricator in its own right, capable of blending different detergent ingredients, based on the homeowner's laundry patterns, to provide the most effective and efficient cleaning cycles.

6 http://www.humansinvent.com/#!/15678/magic-mirror-your-in-store-virtual-fitting-room/
7 http://www.digitalsignageconnection.com/window-shopping-system-gives-adidas-customers-247-store-access-800
8 http://3dprint.com/11606/3d-printed-ear-buds-normal-manhattan/
9 http://www.usatoday.com/story/tech/personal/2014/04/11/staples-3d-printing/7596141/

5. Digital Payments

The payments landscape is undergoing a profound transformation. For the past decade, companies such as Google and PayPal have struggled to drive widespread adoption of their digital payment and electronic wallet technologies. However, according to Accenture's survey of more than 4,000 consumers in North America, consumer adoption of mobile payments is already on the rise. Overall awareness of mobile payments has increased from 73 percent in 2012 to 84 percent today. What's more, consumer use of the smartphone as a mobile payments device has increased significantly over this period—by 24 percent in the United States and by 16 percent in Canada.[10]

NFC-enabled "contactless" mobile payments have garnered a lot more attention—and traction—since Apple's launch of its Apple Pay solution. Some industry observers predict that Apple will do for digital payments what it did for the smartphone: drive mass adoption. Brands including Staples, Whole Foods and Winn-Dixie have announced plans to accept Apple Pay at their retail locations, adding to an impressive roster of cross-industry supporters that includes major brands such as Bank of America, Disney and McDonald's.[11]

Digital payment solutions hold the potential to improve retail operations by reducing checkout times and providing other efficiencies. Digital payments could also drive incremental sales. Combining mobile payment systems with iBeacon technology, for example, could create a seamless experience from promotion through checkout. A streamlined purchase experience could lead to higher conversion rates and more repeat purchases.

Figure 1 shows how digital payment capabilities will further enable the detergent manufacturer's direct-to-consumer channel possibilities. The manufacturer could also leverage the payment data it receives to deepen its insights into consumer behavior—information that the manufacturer currently relies on its retail partners to provide.

10 http://www.accenture.com/SiteCollectionDocuments/accenture-2014-north-america-consumer-payments-survey.pdf
11 http://bits.blogs.nytimes.com/2014/12/16/dozens-more-companies-sign-up-for-apple-pay/

Spotting the Next Disruption—Before It's Too Late

Technology disruptions can fundamentally change value chains, destroying existing ones and creating others. Often, disruptions are caused not by a single technology, but several new and existing technologies that come together in innovative ways.

It's impossible to predict accurately the impact of technology disruptions before they occur, but retailers can become less reactive by investing in three key areas:

Strategy:

Leadership teams must be able to respond quickly as new technology enters the picture. That requires closer ties between IT and business functions to ensure that technology investments are in sync with business needs. By understanding their current value chain, business strategies and technology strategies, leadership teams can more easily identify strategic opportunities for technology innovation.

Knowing when to get out is just as important as knowing when to invest. Not every investment will have a positive impact on the business—which is why more companies are adopting "fail fast" approaches to technology investments. UK retailer John Lewis briefly piloted a virtual fashion mirror to let customers "try on" articles of clothing without getting undressed[12]—but ended the experiment after a few months, citing a lack of sales.[13]

Partnerships:

Through acquisitions or partnerships with non-traditional players, retailers can disrupt their traditional value chains. For example, Japanese online retailer Rakuten has partnered with 30 post offices in Tokyo to establish collection lockers for consumers who are not at home enough to accept delivery of their online purchases during regular delivery hours, or simply don't want delivery personnel coming to their homes.[14]

Additionally, partnerships with consumers themselves can prove valuable into disruption opportunities and insights. For example, through its My Starbucks Idea platform, the Seattle coffeemaker has "crowd-sourced" thousands of technology-, product-, or service-related ideas to enhance its in-store and mobile app tech experiences.[15]

Culture:

Emphasizing innovation as a core element of corporate strategy will lay the foundation for a culture of innovation. Providing access to collaboration tools, new technologies, and research, as well as incentivizing employees to take creative approaches to problem solving (setting aside time each day or week for pet projects, for instance), will further encourage new approaches that extend well beyond current business practices.

The organizations that are able to identify disruptions early and then react quickly to the opportunity will be able to build sustainable growth models. Those that don't will be the subjects of business school cases discussing what went wrong. Which path will you take?

12 http://blogs.cisco.com/retail/cisco-styleme-virtual-fashion-mirror-inspires-sales-across-all-age-groups/?_ga=1.222059803.2013652148.1420772873
13 http://www.computerweekly.com/news/2240179511/John-Lewis-drops-virtual-mirror-project-as-part-of-fail-fast-at-innovation-strategy
14 http://www.japantrends.com/tag/retail/
15 http://mystarbucksidea.force.com/

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