Accelerating Digital Innovation in Retail

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ACCELERATING DIGITAL INNOVATION IN RETAIL

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EXECUTIVE SUMMARY

To be a chief information officer (CIO) at a traditional retail company today is to face a new kind of pressure. The CIO's job is no longer just to keep the company's internal systems running and to produce data that management can use for operational decisions. Retail CIOs today are part of a team that faces a "do or die" imperative with digital.

It's not that consumers have lost their taste for brick-and-mortar retail stores. No one who ventured into London's Harrods or New York's flagship Macy's store in a holiday shopping season in recent years would have come away with that impression. There would have been, in those stores and in other megastores in major cities, the usual crush of humanity. But what matters in retail is not what happened yesterday; it's what's happening now and what's going to happen tomorrow. And what's happening now is that consumer habits are changing—fast.

With online sales growing at almost five times the rate of traditional retail in the West and even faster in Asia, The Boston Consulting Group surveyed retailers to get a baseline on their information technology activities. We strongly believe that retail CIOs need to find ways to reduce their everyday IT operating expenses and apply the savings to digital innovation. We asked survey participants about both their current IT activities and their plans for doing things in new ways.

Here are our main findings:

Median IT operating expenses in the retail industry are 1.2% of revenue.

- The 1.2% median represents a rough dividing line between "full" and "frugal" IT spending. Full spenders (those above the 1.2% threshold) have higher ratios of IT employees to overall staff and

are apt to keep a larger percentage of their IT staff at high-cost locations, often at or near corporate headquarters.

- It's the rare retail CIO nowadays who directly controls all of his or her company's spending on technology. CIOs at full-spending retailers, however, control more of their companies' technology spending via their IT budgets. This may give them an advantage over frugal spenders in defining priorities and developing centralized expertise.

Retailers' ability to innovate using IT hinges on their investments in e-commerce infrastructure and on continued development of their omnichannel capabilities.

- Consumers know it when a retailer they use commits to developing omnichannel capabilities like "click and collect" (which gives customers the option to buy something online and pick it up at a store). What they don't see are the behind-the-scenes investments that support these capabilities—especially the investments in digital supply chains.

- In addition to building omnichannel capabilities, retailers that want to stand out as innovators must use analytics to support personalization. They must also make investments in e-commerce software and infrastructure. Only a handful of retailers practice "innovation discovery," a fourth measure of IT innovation that is about exposing organizations to new ideas and tactics.

Overall, there is still not enough IT-enabled innovation.

- Fewer than half of the IT organizations in our survey scored high enough to qualify as innovation leaders. The retailers that scored well did so mostly by virtue of their omnichannel offerings and their commitment to analytics.

- One might expect that the highest IT spenders would be the most innovative. In many cases, however, retail full spenders don't exhibit the hallmarks of innovation leadership. And there are some frugal spenders that qualify as innovation leaders despite their relatively small IT budgets.

Retailers' ability to innovate is limited in part by their lack of speed in adopting new tools and approaches.

- Most retailers have been slow to embrace cloud infrastructures and SaaS (software as a service) solutions. Their limited adoption of these technologies has kept retailers from approaches that might trim their IT operating expenses and free up cash for new digital investments.

- Retailers have also not moved quickly enough to agile software development. This means that, in most cases, they aren't getting the level of business-IT collaboration that they could be getting and are still too slow in releasing essential software.

INTRODUCTION

THE CIO'S CHALLENGES

Retail shopping today is a dramatically different experience than it was a decade ago. Not only is it easier to get something tailored to your needs; you're also likely to get what you need faster and in a more convenient way.

In many cases, you can now order what you want in advance on the retailer's website and pick it up in the retailer's store, where it's waiting for you at a service counter (or brought to you at the curb). Maybe you haven't ordered it in advance, but you can locate what you need within 45 seconds of entering the store thanks to the retailer's merchandise locator app. And at many retailers, you need not waste time fumbling in your wallet for the right payment card; you can pay for the product with the smartphone you're already holding, and leave the store without stopping at a cashier or kiosk.

Enabling these innovations—and responding when something digital doesn't work—is becoming the responsibility of retailers' IT organizations. That puts the companies' chief information officers front and center in the industry's reinvention efforts.

To get a sense of how retail CIOs are using technology to help their companies innovate and create a better shopping experience, we surveyed two dozen traditional retailers whose revenues range from about $150 million to $45 billion. While there are marked differences in the strides they've made, no traditional retailer is so far ahead in its use of digital technology that it has an insurmountable lead in its market. On the contrary, most traditional retailers are still in the early stages of their innovation efforts. This is partly because traditional retailers haven't fully embraced some new tools and approaches—cloud computing and agile software development, for example—that would help them become more consistent innovators.

In this report, we explore the existing practices and investment priorities of retail IT organizations. And we examine how those practices must evolve if traditional retailers are to retain their customers and remain relevant in the future.

RETAILERS FACE A "DO OR DIE" IMPERATIVE WITH DIGITAL

If traditional retailers feel a greater urgency to adapt these days, it isn't surprising. In the US and Western Europe, online retail sales will grow at almost five times the rate of overall retail sales between now and 2022, according to the research firm Forrester. (See Exhibit 1.) Among BCG's own retail clients, grocery, fashion, and luxury companies have seen some of the biggest jumps in online purchasing.

Customers now demand a high level of convenience, and they expect personalized content.

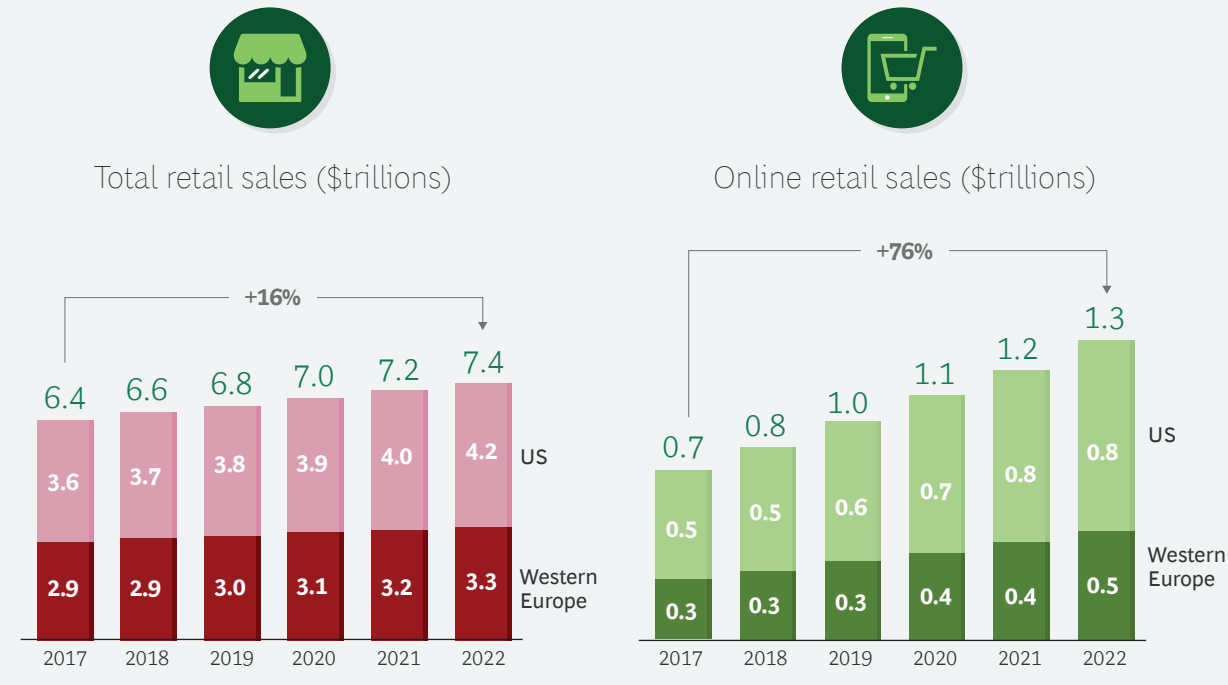
Moreover, the bar is continually going up. Amazon and Alibaba, the companies that are setting the standard for e-commerce in the world's biggest markets, are constantly improving the customer experience by expanding their product selections, lowering their prices, and improving their speed of fulfillment. For a traditional retailer that might spend half a year or more fixing a malfunctioning search engine or enabling in-store returns of online purchases, Amazon and Alibaba's nonstop rollout of innovations (fueled by R&D spending that now reaches $5 billion a year at Alibaba and as much as $20 billion a year at Amazon) creates a special set of competitive challenges. Traditional retailers and the online trailblazers may be playing the same game, but it increasingly appears to be a game that the online companies invented, a game that takes place on the online companies' home turf and is based on rules that the online companies keep revising.

The innovations of the digital-first retailers (which also include companies such as Etsy in the US and JD.com in China) have shaped consumer expectations. Nowadays, retail customers demand a high level of convenience—including fast deliveries and anytime, anywhere access to stores. And they expect personalized content, whether it's the ability to bring up a history of their recent orders with a tap of the finger or instant access to relevant suggestions and discount offers.

For retailers that haven't been able to adjust quickly enough to the new realities, the consequences have been dire. There is a long list of once-successful retailers—for example, Toys"R"Us in North America, V&D in the Netherlands, and British Home Stores in the UK—that are now out of business, in bankruptcy, or struggling to survive.

Traditional retailers have seen the disruption in their businesses, and they understand the need to use digital technology more creatively. What the companies' CIOs are struggling

EXHIBIT 1 | Online Is Growing Faster Than Traditional Retail



Sources: Forrester Data: Online Retail Forecast, 2017 to 2022 (Western Europe), Q4 2017 Update; Forrester Data: Online Retail Forecast, 2018 to 2023 (US).
Note: Euro-to-dollar conversion: 1.13 to 1; Western Europe includes UK, France, Germany, Italy, the Netherlands, and 12 other countries. Because of rounding, not all numbers add up to the total shown.

with is how to fund these innovations. Most retail CIOs have not been handed sizable new investment funds for digital. That leaves them with only one option: become more efficient in the basics of IT and apply the freed-up resources to digital innovation. The good news, for most retailers, is that there is ample opportunity to do this.

VARIATIONS IN RETAIL IT SPENDING

IT spending differs by the type and size of retailer. Among the retailers in our survey, IT operating expenses vary from as much as 3.9% of revenue to as little as 0.6% of revenue, with 1.2% of revenue being the median.

Some types of retail companies are pushed to spend more on IT because of their unique circumstances. For instance, fashion and luxury retailers (median IT budget: 2.1% of revenue) have above-average IT budgets because of the pressure they face to invest in personalization and a superior consumer experience. Medium-size retailers (those with between $2 billion and $10 billion in annual revenue) are another cohort with above-average IT spending levels. Their relatively high level of IT spending (median: 2.4% of revenue) reflects the fact that they are too big to get away with offering only an average online experience but too small to benefit from scale advantages.

"Full" Versus "Frugal" Spending

In terms of IT spending, we identify two basic groups of retailers, with 1.2% of revenue as the dividing line. Retailers above that level are "full spenders," and those below it are "frugal spenders."

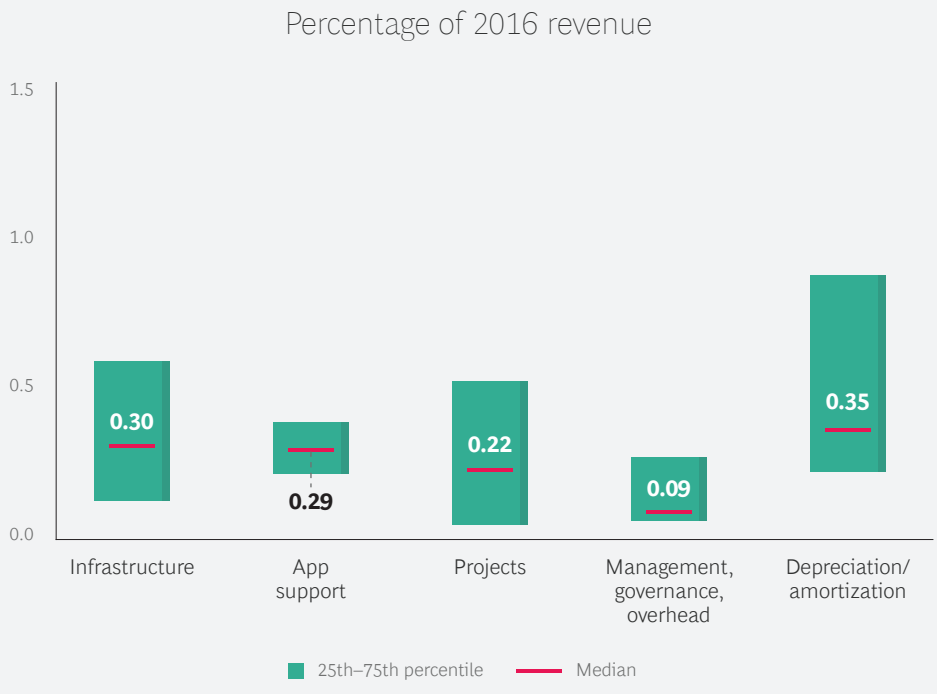
Full spenders tend to spend more on projects: 0.22% of revenue, versus 0.12% for frugal spenders. Full spenders also devote more resources to IT staff. At full-spending retailers, on average, there is one IT worker or full-time equivalent (FTE) for every 81 employees, versus a much more lopsided 124 employees for every FTE at frugal spenders. In addition, IT managers at full-spending retailers have narrower spans of control; they oversee an average of 3.5 FTEs, versus 4.1 FTEs for the average frugal spender. Finally, full spenders keep a much higher proportion of their IT FTEs at high-cost locations, often at or close to the corporate headquarters, than do frugal spenders (59% versus 47%).

A significant portion of the average retailer's spending goes to infrastructure and application support. (See Exhibit 2.) These are among the categories in which retailers may want to reduce their spending in order to create more funds for innovation.

Spending That Is Outside the CIO's Direct Control

One factor that complicates the analysis of IT spending in retail is the increasing difference, in many companies, between the IT budget and overall technology spending. A few decades ago, it wasn't meaningful to make this distinction. CIOs effectively knew about and approved every dollar spent on technology at their companies. That's no longer the case. Technology spending today is more decen-

EXHIBIT 2 | The Average Retailer's IT Operating Expenses



Source: BCG Retail Digital and Technology Benchmarking Survey, 2017.

tralized: a merchandizing organization, for example, might acquire a digital coupons system, or a marketing department might adopt an analytics system, that the CIO has no role in selecting and that doesn't hit his or her budget. Decentralized technology budgets are more common at frugal spenders, where CIOs, on average, control just half of their companies' technology spending, versus three-quarters at full spenders.

Arguably, the greater control that full-spending CIOs have over their companies' overall technology expenditures is an advantage, allowing them to align priorities, ensure cost efficiencies, and develop centralized expertise in ways that benefit their companies broadly.

FOUR SIGNS OF IT INNOVATION IN RETAIL

How can one tell if a retailer's IT organization is contributing to digital innovation and helping provide a better experience to consumers? We can all see digital innovation in retail—the new uses of technology within stores, customers' ability to "track and trace," the superior functionality and usability of some retailers' mobile apps. The question is what a retailer's IT organization needs to do to enable such innovations.

We believe there are four critical areas that traditional retail IT organizations need to focus on in order to advance their companies' innovation goals: support for personalization, omnichannel capabilities, investments in e-commerce software and infrastructure, and innovation discovery. These four areas were at the heart of our survey. (See the sidebar, "A Survey to Measure Innovation Levels.") Here is more about each area.

- **Support for Personalization.** This area concerns a retailer's use of technology to strengthen one-on-one relationships with consumers. It can be accomplished through an understanding of consumers' tastes. A clothier, for example, might anticipate someone's next-likely purchase on the basis of lookalike analysis and the customer's recent transactions and online behaviors. Personalization can also serve in proactive retention—spotting a change in customers' purchasing patterns, for instance, and using targeted offers to win them back when data suggests that they have switched to rival vendors.

  In the survey, we looked for two markers to determine a retailer's level of personalization. The first marker, capture of consumer data, refers to the quality of the databases that a retailer has built using both its own and third-party data. The second marker, advanced analytics, indicates a retailer's ability to build and populate microsegments of consumers and target them with specific offers.

- **Omnichannel Capabilities.** Shoppers today want to move seamlessly between the physical and online realms. They expect to be able to buy something online and pick it up in the store, or to return to a store an item that they purchased online. If something is out of stock in a physical store, they expect a sales clerk, using a tablet or other mobile device, to be able to order the product through the online store and arrange for accelerated delivery.

  Allowing customers to go back and forth between offline and online stores isn't only a matter of aligning sales incentives and connecting a few databases. Retailers must make significant investments in technologies that harmonize their customer

A SURVEY TO MEASURE INNOVATION LEVELS

IT organizations often talk internally about how far they have come in their digital transformations—and try to figure out how they stack up against their peers. But this sometimes happens in the absence of a clear definition of digital transformation, limiting the usefulness of these conversations and making peer group comparisons impossible.

To get a sense of retail companies' progress, BCG conducted a survey of the industry's investments in nine digital transformation areas. (See the table below.) Twenty-four European and North American retail companies participated in the survey, which was conducted in the first half of 2017.

Main Survey Topics	Areas Covered by Questions
Personalization	Capture of consumer data
	Advanced analytics
Omnichannel	Investment in omnichannel capabilities
	Use of smart supply chain
	Development of in-store technology
Digital	Investment in digital transformation
	Investment in digital marketing
	Use of social media
Innovation discovery	Innovation discovery activities

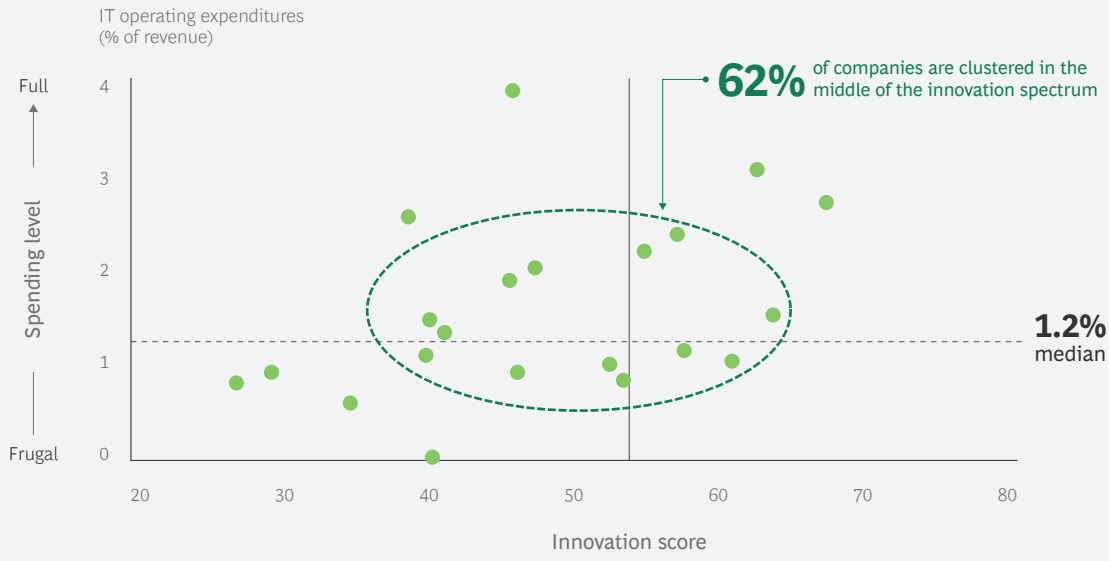
data, rationalize their pricing across channels, and create a digital supply chain that provides an end-to-end view of inventory.

- **Investments in E-Commerce Software and Infrastructure.** Given the growth in online sales in nearly every retail segment, it is essential for retailers to have a strong online presence—including the ability to sell at least some products directly. For this reason, we asked survey participants whether investing in front-end and back-end e-commerce software was a priority for them today, and, if not, when they expected it to become a priority (within the next 18 months or at some point after that). The nearer the priority point, the higher the retailer's innovation score.

- **Innovation Discovery.** This area reflects retailers' resourcefulness in applying ideas and tactics that wouldn't occur to them in the normal course of doing business or as a result of their everyday IT activities. We treated retailers' participation in hackathons, their use of technology-focused M&A, their partnerships with venture capitalists, and their opening of offices in geographic tech centers (such as Berlin or Silicon Valley) as indicators of innovation discovery.

We analyzed retail companies' activities in these four areas and calculated a composite innovation score, on a scale of 1 to 100, for each company. Fewer than half of the survey participants qualified as innovative. Moreover, it isn't clear whether full spenders derive an innovation benefit from their investments. In some cases, they certainly do. But in other cases, full spenders' innovation performance is merely average. And there's an even bigger surprise: some retailers qualify as innovation leaders despite IT spending that puts them in the frugal category. (See Exhibit 3.)

Exhibit 3 | Even at Higher Spending Levels, IT Innovation Is Limited



Source: BCG Retail Digital and Technology Benchmarking Survey, 2017.
Note: Sample size is 21 companies. The innovation score is a composite that reflects a company's performance on the four dimensions of IT-enabled innovation. The lowest-scoring company in our survey had an innovation score of 27; the highest score was 67.

HOW LEADERS DIFFERENTIATE THEMSELVES

The survey results showed us where retailers are paying the most attention to innovation—and where they are paying less attention. The results also allowed us to separate retailers into two broad categories: "leading innovators" and "traditional operators."

Leading innovators do sophisticated analyses of consumer data and take an omnichannel approach.

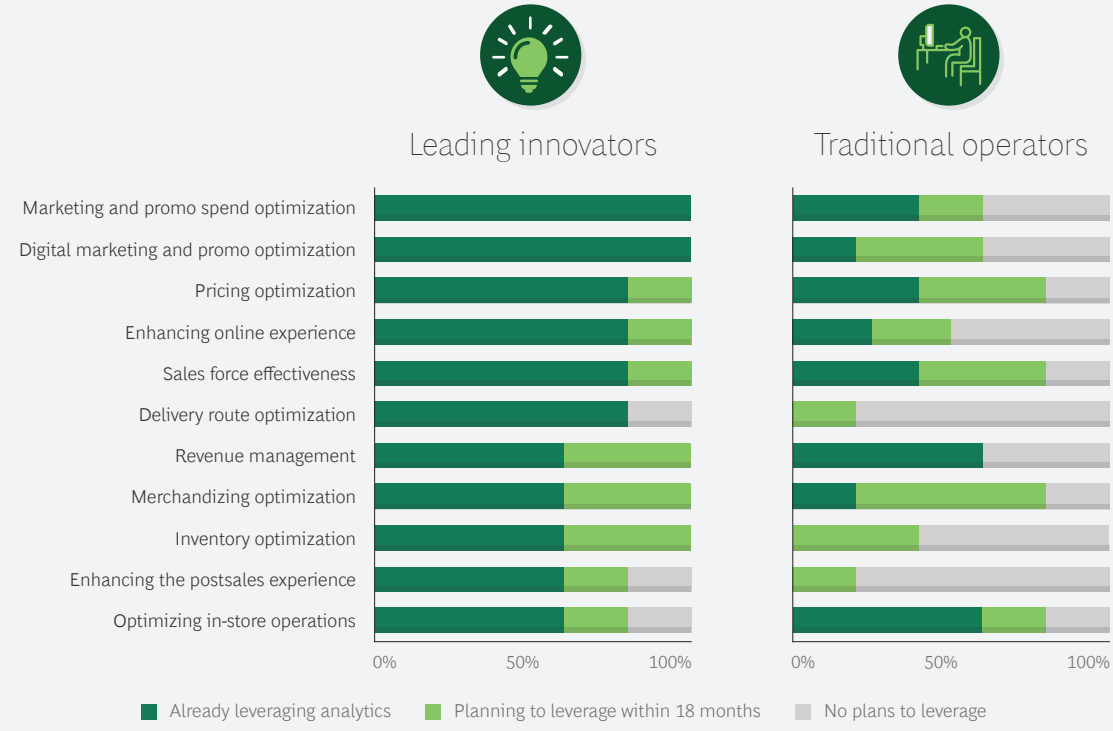
The retail companies that are leading innovators are well ahead of traditional operators in capturing consumer data and in performing sophisticated analyses of it. Leading innovators do extensive analyses of the number of consumer visits they get, of spending by SKU, and of the actions consumers take (such as abandoning their shopping carts). Leading innovators also build much more sophisticated consumer profiles and do more analytics related to operations, allowing them to see, for instance, changes in inventory and where delivery trucks are on their routes and when they will arrive.

With respect to their analytics efforts, leading innovators simply target more areas. They use analytics to optimize their marketing expenditures, their pricing, and the online experience itself. (See Exhibit 4.) Traditional operators are at a much earlier stage in the use of such analytics, and some have no immediate plans to apply analytics to these areas.

Leading innovators are also advanced in their omnichannel capabilities. They are doing much more than traditional operators in "click and collect," in selling online and then shipping from stores, and in drop shipping (where a product is ordered online and fulfilled by a third-party supplier). Even leading innovators, however, have been slow to deploy technology that improves what happens in the store environment. In particular, relatively few leading innovators equip sales associates with mobile point-of-sale systems or set up real-time store monitoring. (See Exhibit 5.)

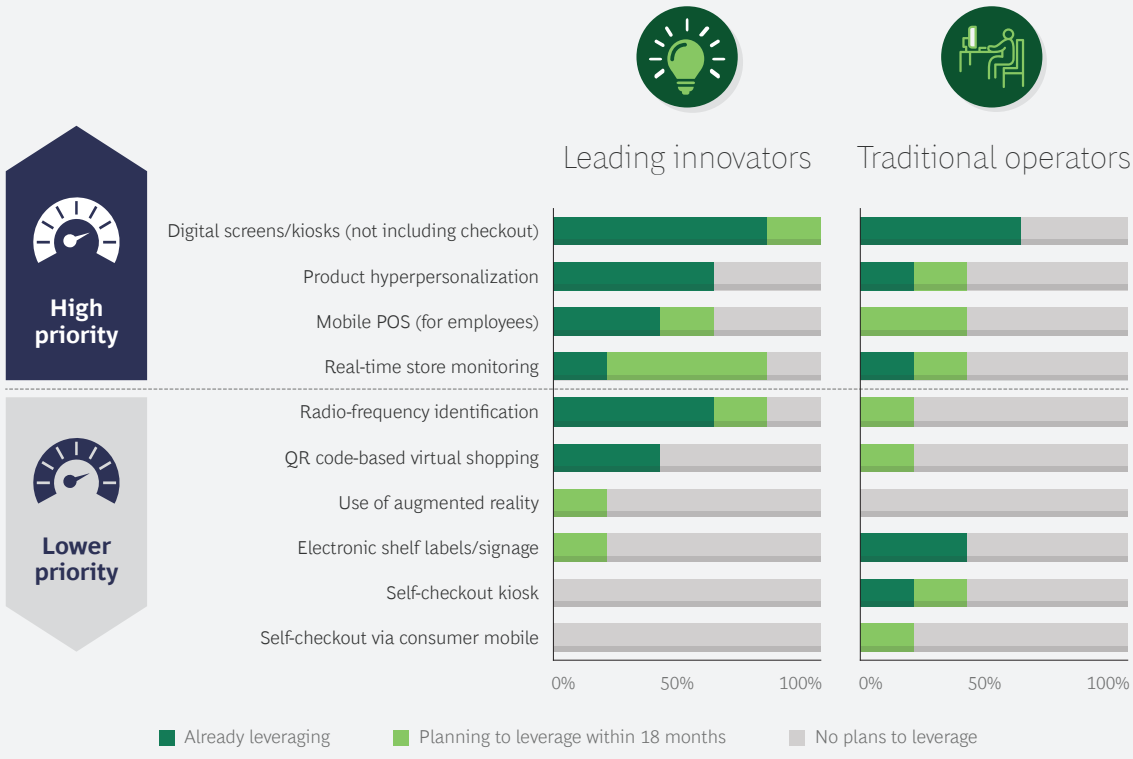
When it comes to their investments in e-commerce software and infrastructure, both leading innovators and traditional operators pay attention to the front end of their operations, including web commerce platforms and apps, and to tools that help them with marketing and customer engagement. For instance, almost all traditional retailers now market through email and social media. (A social media presence in and of itself is no longer a point of differentiation for retailers.)

Exhibit 4 | Leading Innovators Apply Analytics to More Areas



Source: BCG Retail Digital and Technology Benchmarking Survey, 2017.

Exhibit 5 | In-Store Omnichannel Is Still Not the Norm

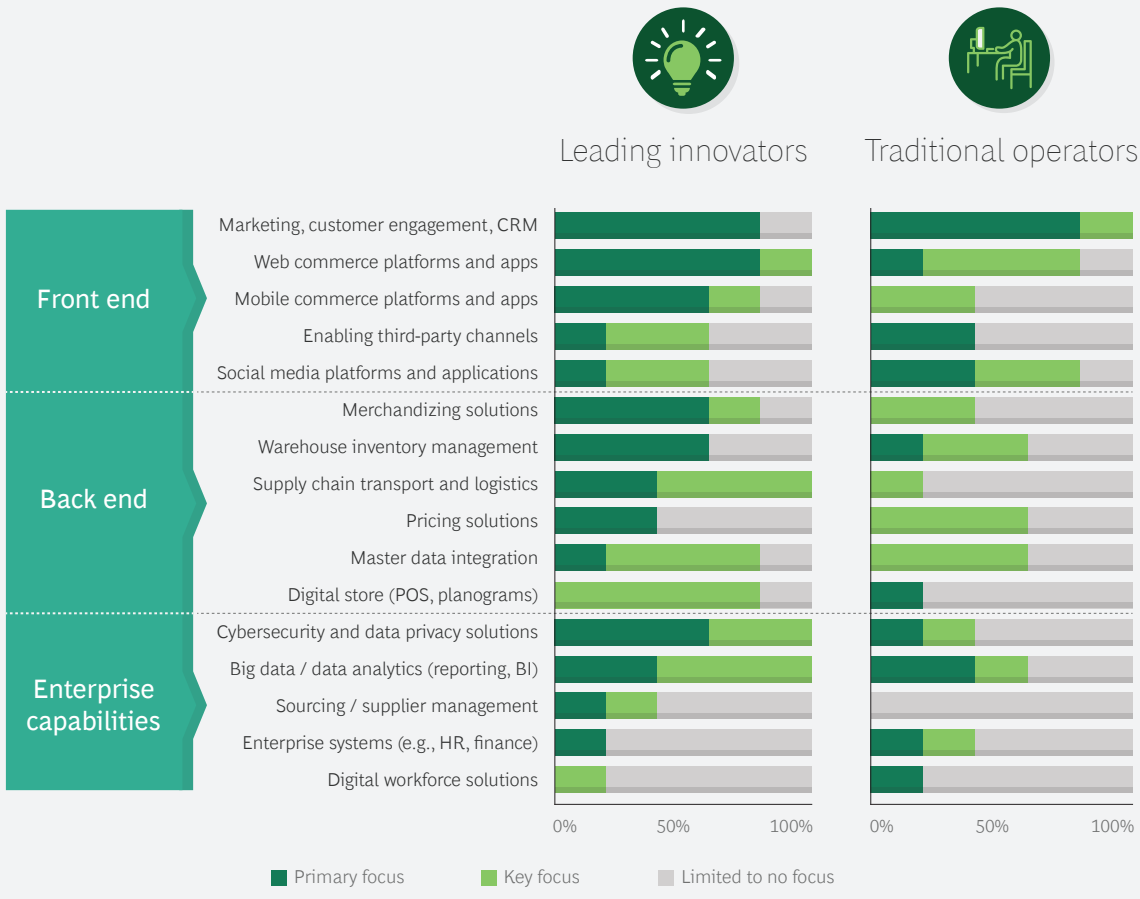


Source: BCG Retail Digital and Technology Benchmarking Survey, 2017.

Leading innovators, however, have built or bought more personalization tools, and they have made substantially more investments in other parts of the value chain, including stakes in merchandizing solutions and in technology to help with warehouse inventory management. (See Exhibit 6.)

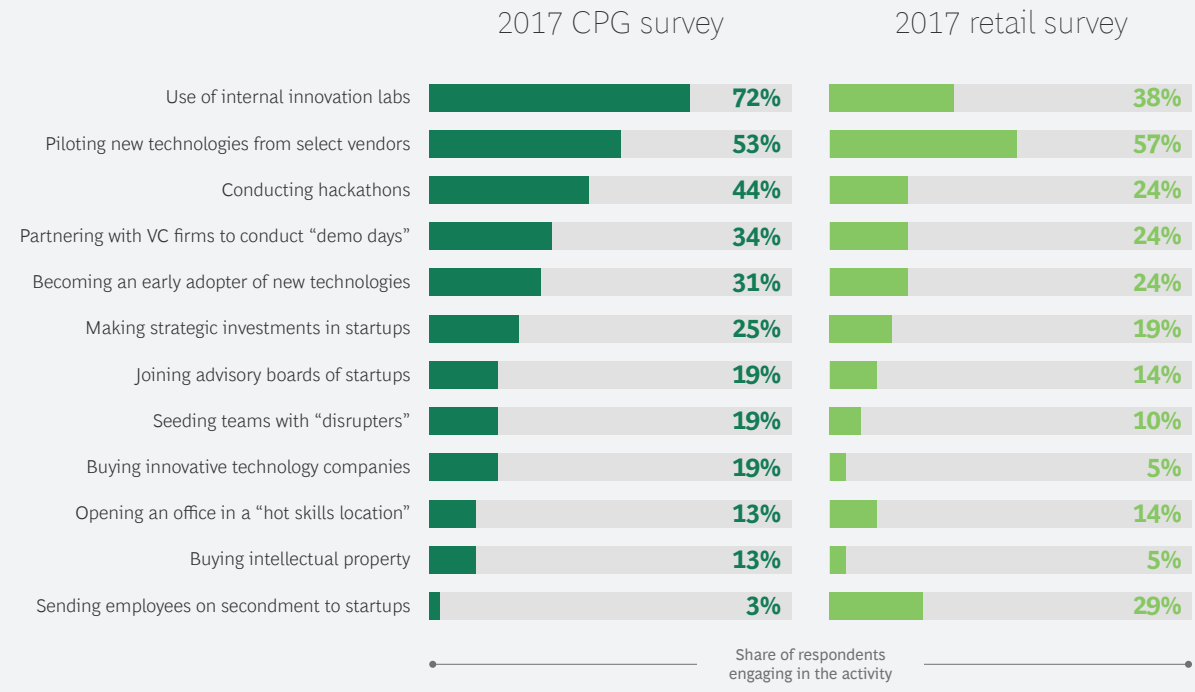
Finally, there are the steps that retailers' IT departments have taken in innovation discovery—that is, their use of unconventional activities to gain exposure to new technologies. What's most notable here isn't the difference between leading innovators and traditional operators. Rather, it's the conservative posture of just about all retailers. Relatively few retail CIOs have agreed to beta-test new technologies or to sponsor hackathons; even fewer have participated in venture capital "demo days" in order to see what the VCs' portfolio companies are doing. Only about one in ten traditional retailers has bought an innovative technology company (though among the very few retailers active in this area is a very significant one: Walmart, which purchased Jet.com, Hayneedle, and Moosejaw). Indeed, despite the changes that have been roiling retail since the arrival of Amazon, the sector has been relatively slow to try new approaches, as is evident from a side-by-side comparison with the consumer packaged goods sector. (See Exhibit 7.)

EXHIBIT 6 | Leaders' Investments Touch More of the Value Chain



Source: BCG Retail Digital and Technology Benchmarking Survey, 2017.

Exhibit 7 | Retailers Lag CPG in Nonstandard Innovation Strategies



Sources: BCG Retail Digital and Technology Benchmarking Survey, 2017; BCG/GMA Information-Technology Benchmarking Survey, 2017.
Note: CPG = consumer packaged goods.

TACTICS, OLD AND NEW, FOR IMPROVING IT OPERATIONS

Retail CIOs have a variety of technology options to make their IT organizations more efficient. One—which has been around for decades—is outsourcing. Outsourcing is an excellent option for commodity IT services, including those related to infrastructure and desktop support. Yet many traditional retailers still run their own data centers and support their enterprise applications onsite with their own people; many also manage their own networks, including their audio and videoconferencing systems and their wide- and local-area networks. There are not a lot of good reasons to do this. Retailers should use outsourcing more broadly and more strategically.

Cloud technologies, which can reduce infrastructure and depreciation costs, are another option that retailers are neglecting. A third underutilized option is software as a service (SaaS), which shifts the software development burden to outside vendors and enforces standard ways of working.

For now, traditional retailers are using the cloud and SaaS mostly to help them connect to social media platforms, handle their mobile applications, and support their e-commerce initiatives. But cloud and SaaS solutions can handle a host of other applications, including data analytics, master data management, sourcing and supplier relationship management, and cybersecurity. Although traditional retailers say they will handle more of these applications through cloud technologies, many don't expect to fully implement their cloud and SaaS plans for several years.

The Role of Agile Development

A newer focus of IT organizations, agile development promises to increase both efficiency and innovation. The agile model has become associated with the most successful digital innovators—companies like Amazon, Google, Netflix, and Spotify. These companies all have good ideas, but what really sets them apart is an approach to improving their core products that's grounded in how they handle technology and do software development.

For all of these companies, agile software development involves working in small teams that write and release code in "sprints"—that is, in two- to four-week intervals. These teams sequence their work so that the most important features and fixes get out first. One agile team might be assigned to the user interface of a mobile application, a second to the payments function of a website, and a third to the website's recommendation engine.

In these examples, the user interface, payments function, and recommendation engine are all "products," toiled over by multidisciplinary teams that work on the products full time, with the input of a business executive who serves as the product's "owner." This is a

very different way of developing software than the one most companies use today. Most companies still default to a "waterfall" model in which the project has a clear budget and end date, milestones are strictly sequential, and the development team moves on to something else when the project is complete (or when the funds dry up).

Although it's usually a digital native that's held up as the poster child for agile development, some companies whose origins go back further than the commercial internet have become adept at the discipline. For example, Starbucks employs a number of full-time teams whose collective job is to develop and continually improve different parts of the Starbucks mobile app. The app created by these teams (which uses contextual data, along with the customer's purchase history, to make recommendations and personalized offers) has more than 50 million active users and accounts for billions of dollars in revenue each year.

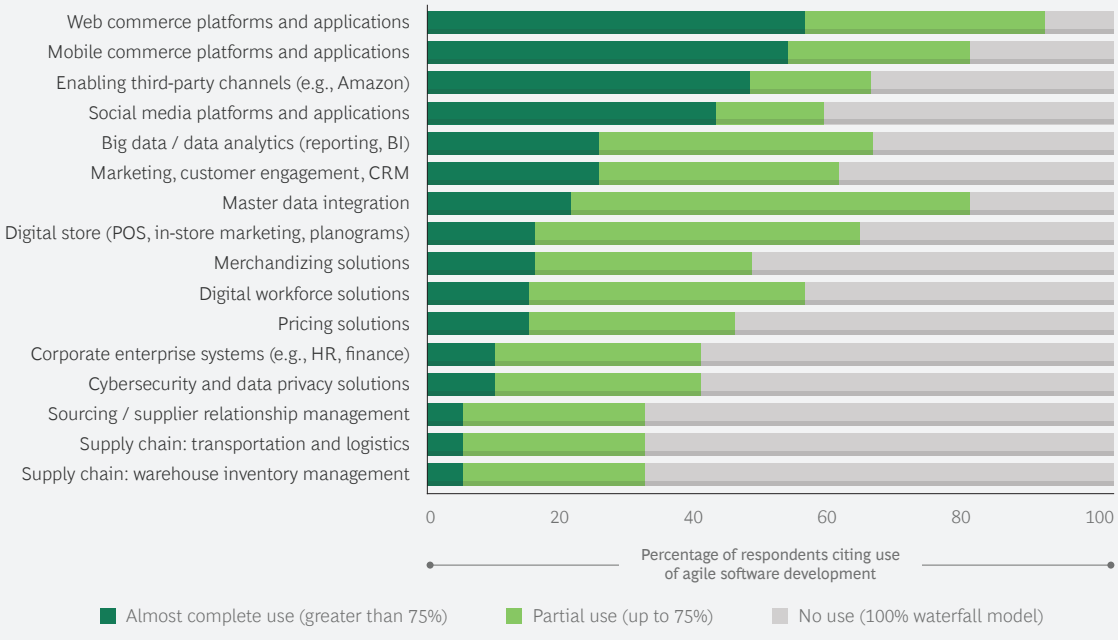
Retailers could even use agile methodologies for parts of the business that don't strictly relate to software development. This has begun to happen in other industries: Car companies have started using agile approaches in automobile design. And some aircraft manufacturers are using agile to develop next-generation doors and other parts.

Agile and Enterprise Systems

There is already one clear way for traditional retailers to use agile beyond their online assets. Where possible, retailers should also be using agile to manage their traditional IT systems. The approach of using agile for a wider range of development tasks—an approach called agile at scale—would help retail IT organizations become more efficient, in part because agile's ethos of empowering teams frees up IT managers for higher-level work. Wider use of agile would also make traditional retailers' IT departments more productive. We estimate that companies using agile have between 65% and 80% fewer prerelease software defects and between 50% and 75% fewer postrelease issues that affect customers.

For most traditional retailers, however, agile at scale is still a far-off possibility. Many of these companies have adopted agile for their e-commerce, personalization, and analytics initiatives. But most are not yet using agile to become more efficient in their traditional domains or to manage their older systems. (See Exhibit 8.)

EXHIBIT 8 | Retailers' Use of Agile



Source: BCG Retail Digital and Technology Benchmarking Survey, 2017.

CONCLUSION

GEARING UP FOR THE FUTURE

To many retail CIOs, it may seem like the "asks" in the era of digital innovation are coming one after the other. Once it was making sure that the company's social media feed had a robust technical foundation. Then it was about rethinking the approach to customer data. Today it is agile. Tomorrow it could be rapidly and seamlessly integrating new technologies like the Internet of Things, augmented reality, and advanced analytics tools, and making it all work with legacy technology platforms.

Retail CIOs are going to have to figure out which new developments they should treat as priorities. And all of them must find a way, possibly with no more budget than they have today, of funding their companies' leap into the future. This means taking a fresh look at just about everything they're doing and determining if there's a way to do it better. There's neither time nor money to waste.

FOR FURTHER READING

The Boston Consulting Group has published other reports and articles that may be of interest to readers of this report. Recent examples include the following.

Accelerating Digital Innovation in CPG
A report by the Boston Consulting Group, December 2017

How Companies in China Blend Digital and Physical Commerce
An article by The Boston Consulting Group, October 2017

Taking Agile Way Beyond Software
An article by The Boston Consulting Group, July 2017

What China Reveals About the Future of Shopping
An article by The Boston Consulting Group, May 2017

Leaner, Faster, and Better with DevOps
An article by The Boston Consulting Group, March 2017

Four Digital Enablers: Bringing Technology into the Retail Store
An article by The Boston Consulting Group, February 2015

NOTE TO THE READER

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