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PERSPECTIVES ON RETAIL TECHNOLOGY

THE EFFECT OF DIGITAL ON RETAIL

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About PoRT

Nielsen *Perspectives on Retail Technology* (PoRT) is a biannual publication that tracks technology trends significant to retail. It has a rotating editorship of Nielsen experts who use each edition to showcase a major trend, such as big data, in a series of in-depth articles.

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FROM THE EDITOR

The power of social media, mobility, analytics, cloud and the internet of things continue to drive the digitization of life. In the FMCG world we're only just beginning this digital transformation, but as we look at other industries—audio, media, publishing, transportation and others—it's clear that digital trends accelerate quickly and as an industry we need to be prepared.

DIGITAL TRENDS ACCELERATE QUICKLY AND AS AN INDUSTRY WE NEED TO BE PREPARED.

What impact will the digital transformation have on the FMCG industry? What will it mean for the consumer, retailer and manufacturer? And what can we learn from digital disruption in other industries? This edition of *Perspectives on Retail Technology* offers a point of view on two closely connected enablers in answer to these questions.

In "How to Make a Good Chatbot," we predict that a level of customer service once only available for luxury goods in high-end department stores will become the new norm for everyday transactions.

In "The Persistence of Retail Measurement," we examine how digitization will progress, what will continue and what will change. We discuss new ways of understanding the consumer and how market measurement will have to evolve.

At Nielsen we've successfully navigated a digital transformation in media, through our Total Audience measurement strategy. Likewise in FMCG, we're committed to the same transformation: measuring the total consumer across all channels at more granular levels. We're excited to share what we've learned on our journey and where we think the road ahead will take us. I hope you find the articles stimulating and helpful as you work through these questions in your own business.

Tom Edwards

HOW TO MAKE A GOOD CHATBOT
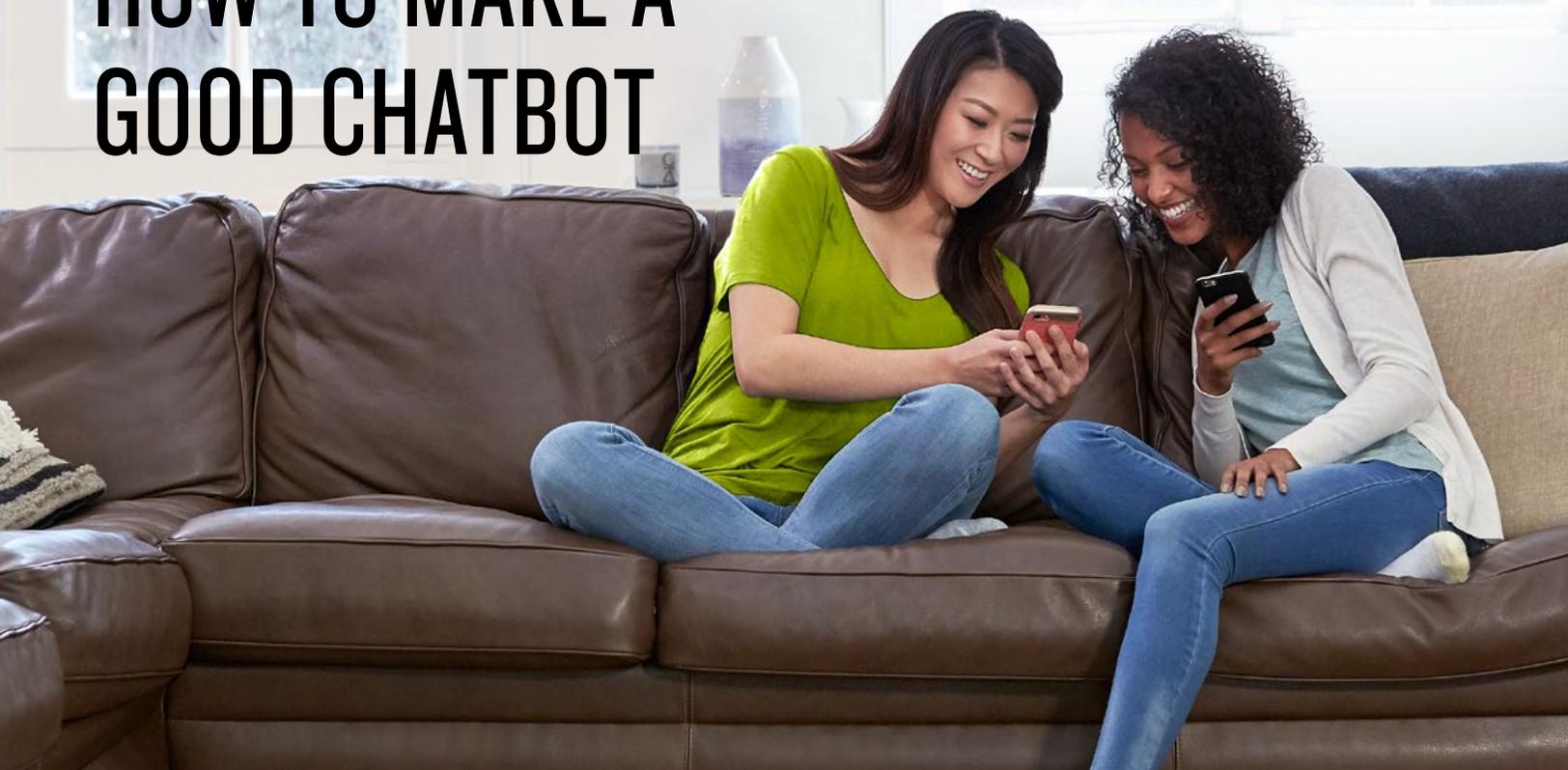
Your kid tore his favorite jeans and you need to know if your local store will be open after work so you can pick up a replacement pair. If only you had a personal shopper who could find out what time the store closes. And because they knew you, they'd naturally ask, "Is there anything else you're looking for today?"

Instead of you rushing to the store only to find that the jeans are out of stock, your personal shopper would check the inventory ahead of time. A good personal shopper would also offer to send you links to styles your kid likes so you could start browsing before you arrive. And if you knew exactly what you wanted, they could hold the item for you. Or they could ship the jeans to your door so you could skip the trip to the store altogether.

As long as the personal shopper is a person, that's a service only a small percentage of customers can get from their local store. But if the interaction is handled by an AI chatbot through a messaging interface, a store can afford to do this for all their customers. Making everyone who steps into your store feel like a millionaire is a pretty good business strategy.

PEOPLE LOVE CONVERSATIONAL INTERFACES

The adoption of chatbot interfaces has been rapid. Apple's Siri first appeared less than six years ago, but already IBM, Google, Amazon, Microsoft, Samsung, Tencent, Facebook and several smaller companies have chatbots in the market. Surveys show that 60% of consumers used a voice-activated virtual assistant in the last year, and Google estimates that a quarter of all searches on mobile devices are carried out using voice commands—making the now-ubiquitous smartphone into a chatbot, too. Even though most bots can't cope with complex requests, the fact that they work at all creates a great deal of buzz. They allow technology to work in environments where hands-free operation is at a premium, such as in the car, kitchen, workshop and street.

In addition to their convenience, conversational interfaces are popular with consumers because they have a human-like intimacy. We're wired to think of conversation as the way

we communicate with people, not systems or companies. Surveys show that consumers are just as willing to use chatbots to interact with a retailer as they are to pick up the phone or send an email; individual preferences split about a third each between chat, phone and email. Millennials are significantly more likely (40%) to use chat than others, and 9% of millennials would prefer to interact exclusively with a robot rather than a human.

Given the advantages, it's no surprise that many companies are keen to use chatbots for customer service. The challenge is that turning speech into words, understanding the intent of those words and reacting appropriately is technically very difficult. No one wants the sort of painful interaction they had with voice-activated telephone menu systems of 15 years ago ("Please select one of the following options," "One please," "You selected Option Two").

Even today, the idea of building a natural language processing engine is impossibly daunting for most companies. The good news is that there are several advanced conversational AI platforms—which can be used to build chatbots—available from the big players such as Microsoft, Facebook and many specialist companies. These platforms take care of the complexity of speech and language processing and let you concentrate on designing the consumer experience you want to provide.

BOT MUST-HAVES

The simplest and most obvious question is: what are you going to call the bot? Some companies have given their bots human, or human-like, names (Siri, Alexa and so on), whereas Google's Assistant and Home have impersonal names. The difference is not trivial. While consumers are comfortable with companies personifying their bots, giving the consumer the impression that they're interacting with a human when they're not is potentially disastrous. Research shows that 73% of consumers say they wouldn't use a brand's chatbot a second time if something went seriously wrong with their first interaction.[1] A consumer expecting to talk to a flexible, helpful and understanding person is inevitably going to be disappointed by a bot with limited functionality, even if the interaction isn't a disaster. This explains why many companies try to manage expectations by giving the consumer cues, such as using a cartoon

representation of the bot rather than a picture of a person.

Despite this potential pitfall, companies should still look to exploit the human-like features of advanced conversational AI platforms. For example, these platforms make it possible for a brand owner to create a bot whose "voice" (sassy, measured, serious, youthful, etc.) reflects the personality of their brand. Bots provide a way to deliver the brand voice in a direct, one-on-one interaction at a far greater scale than human advocates ever could. Potential like that cannot be ignored, even if there is risk involved.

> ## BOTS PROVIDE A WAY TO DELIVER THE BRAND VOICE IN A DIRECT, ONE-ON-ONE INTERACTION AT A FAR GREATER SCALE THAN HUMAN ADVOCATES EVER COULD.

Another important consideration is how to exploit the omni-channel capacity of bots: they can be deployed to social media, messaging apps, websites, email, an in-store robot and more. They're also "always on." Consumers were initially delighted when brands took to social media, providing a convenient way to get in touch with customer service representatives. But the limitations of this approach soon became apparent: for example, a transport company in Oxford runs a 24-hour bus service, but only staffs its Twitter presence, which provides service updates and customer support, during office hours. It's no surprise that one-third of consumers who contact brands via social media never get a response. But a bot never sleeps, and so can respond to questions all day, every day. It can escalate a case to human service representatives when necessary—but only if they are available; making bots available without a human back-up is a mistake. More generally, it's important that companies consider where and how they should deploy their bot to reach the largest number of consumers, and how they can deploy it for maximum effect.

Companies also need to figure out how to make the best use of the customer information that they have. To be clear, ignoring this customer information simply isn't an option— digital shoppers are aware that companies have data about

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[1] Sherman, Jill. "Chatbots: A Guide for Brands." The Huffington Post. December 14, 2016.

them, and expect companies to be able to connect the dots ("I never buy khakis. Why did you send me an offer on khakis?"). A bot without knowledge of the consumer will ask redundant questions, and may appear unhelpful or obtuse. At the same time, it's vital that the bot uses the consumer's information in a sensitive way. Most people would be happy to receive a discount on their birthday, but the sort of data mining that helped one retailer deduce a teen was pregnant and send her offers—that her father saw before she had told him about the pregnancy—proved less welcome. The consumer must see the interaction with the chatbot as friendly to their interests, which means walking a fine line not often written into your typical one-to-one marketing algorithm.

> ## DIGITAL SHOPPERS ARE AWARE THAT COMPANIES HAVE DATA ABOUT THEM, AND EXPECT COMPANIES TO BE ABLE TO CONNECT THE DOTS.

It's also important to consider the issue of responsibility. A bot can offer better service if it knows about certain factors affecting the customer's purchasing habits, such as dietary preferences or medical conditions. But what if the bot fails to warn the shopper about a product that could cause an allergic reaction?

Along with intimacy and personalization, bots can inject intelligence into the sales process. If your kid's favorite jeans weren't available at your local store, a smart bot would check other stores in the chain for stock. If that didn't result in any hits, the bot would suggest alternative products; based on your value as a customer, the bot might even offer a more upscale option for the same price. And if there were no appropriate alternatives, the bot could offer to notify you when the jeans are in stock again.

Although it's counterproductive to create a bot that's nakedly mercenary, the bot should make it easy for the consumer to buy. There should be a smooth transition from question to purchase ("Would you like me to reserve these jeans for you?"), just as if the consumer were in the store. Again, the

bot needs to walk a fine line—just like a human salesman—between being too pushy and losing a sale for fear of being too intrusive.

It's important to recognize that bots are not just data consumers, but can also be rich data sources: consumers are likely to mention birthdays, anniversaries, color or size preferences and more during a conversation. This information then needs to find its way back into a customer relationship system to enrich future interactions, rather than being discarded. Bots can even carry out lightweight surveys, gathering customers' opinions on products or on the service the bot itself provided.

BOTS IN REAL LIFE

All these examples show bots hosted outside the store: by smart home devices, in phone apps or on websites. But as with so many other aspects of retail, the digital revolution is blurring the divide between the physical and virtual worlds. Bots may not be as prevalent in brick-and-mortar stores as in e-commerce, but they are gaining ground. Walmart recently filed a patent to use drones to move products inside stores. Customers often find it difficult to locate items in large, hangar-style stores, especially when all the human employees are busy elsewhere—manning the checkouts, restocking shelves or dealing with a spill in aisle seven. Walmart thinks drones could fill the gap, either by leading the customer to the product or by bringing it to them. Given that waiting around for a store employee to help you is one of the most frequent negative experiences in shopping, Walmart might well be onto something.

Lowe's certainly thinks so. They'll be deploying machines called LoweBots in 11 San Francisco Bay Area stores this year. Like a chatbot, the Lowe's robots will be able to process natural language, so they can answer questions such as, "Where can I find a cordless drill?" And like chatbots that recognize when a customer is loitering on a website, the robot can spot a person standing bemused at a large display and go over and offer to help. Lowe's is also using their robots to gather data, monitoring what's happening in different parts of the store at different times of the day.

In a further blurring of the physical and digital worlds, Lowe's is using AI (in this case, Microsoft's Cortana platform) to analyze a consumer's online data—for example, their

Pinterest pins—so that they can suggest products based on styles the consumer has shown interest in online.

All this sounds cool, but it doesn't clarify exactly how significant chatbots are to your business. Improved customer service and engagement are all very well, but the acid test is whether chat interfaces increase sales and conversion rates. Bots are so new that there isn't enough data to show what kind of return on investment businesses can expect from them. Nevertheless, the huge success of WeChat—the chat-based instant messaging, commerce and payment service with almost 900 million active users in China—and the popularity of chat interfaces amongst millennials cannot be ignored. Companies standing on the sidelines while their competitors experiment with what could be game-changing technology are feeling increasingly nervous. It may not be safe to jump head-first into the water just yet, but it's certainly time to get your feet wet.

THE PERSISTENCE OF RETAIL MEASUREMENT

Back in the 1950s, cars had no self-awareness. They cornered like waterbeds on wheels, and when they broke down they couldn't tell you what was wrong with them. A mechanic would listen to the engine, use a continuity tester to check the wiring or make any number of diagnostic measurements. Sometimes finding the problem depended entirely on the mechanic's experience, often compounded with luck and guesswork.

By contrast, modern cars are intelligent and instrumented: they contain dozens of processors and hundreds of sensors that monitor everything from engine performance to tire pressure, continuously and in real time. They can diagnose their own faults and take appropriate action, such as putting themselves into "limp home" mode. Some of them can even drive themselves.

What do self-driving cars have to do with selling consumer packaged goods? Well, imagine CPG retail processes became fully digitized—a process that has already begun. All sorts of physical things would "measure themselves" just as cars do, and react accordingly: for example, a shelf that sensed

it was nearly empty would order an automatic re-stock. This digital approach to retail is already ingrained in e-commerce, and it's only a matter of technology before it becomes widespread in brick-and-mortar stores. Then, wouldn't the instrumentation and self-awareness of retail processes mean the end of measurement?

WHAT WE LEARNED FROM MEDIA

Certainly, there'd be no need for routine operating process measurements; for example, smart internet-of-things-enabled shelves would eliminate the need for in-store audits and planogram compliance checks. But retail processes do not happen in isolation. They are part of a bigger world, and in a digital environment the measurement of context is more vital than ever. At its simplest, retailers need to measure the demand signals outside the digital system—weather, footfall, holidays, disposable income, competitors, market trends and so on—to provide input necessary for digital retail systems to work effectively.

RETAIL PROCESSES ARE PART OF A BIGGER WORLD, AND IN A DIGITAL ENVIRONMENT THE MEASUREMENT OF CONTEXT IS MORE VITAL THAN EVER.

But there is a more fundamental issue, and the example of digital media and digital advertising is instructive here. Digital advertising platforms provide detailed information about consumers' exposure to advertising and conversion. The depth of information available on these platforms is remarkable, but understandably, these companies don't want to provide complete transparency into their data for competitive reasons. However, they sell advertising and provide measures of the effect of this advertising.

Different platforms don't necessarily use the same metrics. Even within a single platform, sometimes multiple properties don't use standardized metrics. Comparing performance across different walled gardens, let alone with "legacy" outlets like broadcast television, is not easy.

Third-party measurement, which standardizes measures across channels to provide a total audience read and lets platform companies demonstrate that they're not grading their own homework, is becoming increasingly important in digital advertising.

As retail becomes more digital, the industry will face exactly the same challenges. Until new technology developments and industry agreements create a world with full transparency where every player can reliably and precisely assess all others' performance—not a development we expect, if only for competitive reasons—the need for third-party independent measurement will not go away.

HOW MEDIA WENT DIGITAL

Analog media content such as TV and radio was originally distributed through broadcast channels. After a few decades, these were supplemented by narrowcast channels such as cable and satellite. At the same time, many types of recording technology arose to support repeat and time-shifted viewing. In this pre-digital world, it was difficult to work out who was viewing what content.

This all transformed when content was digitized. Companies including Apple, Netflix and Amazon started providing digital content on demand, on any device. These digital offerings were so successful that Netflix and Amazon now invest more in programming than most countries, including South Korea and Australia.[1]

Along with supporting on-demand viewing on any screen, digital companies can identify the individual streaming the content—a major advance. They can also provide the viewer with an experience personalized in real time, including showing them promotional messages such as "if you liked that, we think you'll like this" links to more content. The digital process is instrumented and self-aware.

Similar systems can be found in online advertising. Digital marketing hubs allow online advertising to be personalized to individuals in real time and at scale. This is only possible because the advertising is handled programmatically by algorithms. And because advertising is programmatic, it's susceptible to improvement by machine learning. A trained algorithm can help an advertiser adapt to its audience based on real-time consumer response to the campaign. A retailer can use feedback from the system to adjust its display creative, online content, mobile content and product recommendations, aligning them with real-time changes in shopping behavior.

Compared to advertising in print media and on traditional TV, which is broadcast and has lead times of days, weeks or months, this is remarkable. Combine this with the ability to target advertisements to individual consumers, and you can see why the spend on internet advertising is set to eclipse TV advertising spend globally by 2020.[2]

[1] "Netflix and Amazon Outspend CBS, HBO and Turner on TV Programming, IHS Markit Says." Business Wire. October 17, 2016.
[2] Marvin, Ginny. "Report: Global Internet Ad Spend To Overtake Traditional TV By 2020." Marketing Land. June 22, 2015.

E-COMMERCE CAPABILITIES MEET BRICK-AND-MORTAR

This approach makes sense for digital goods, but surely it can't be applied to a can of beans?

In one way, the digital transformation of CPG retail has already happened—it's called e-commerce. E-commerce is simply a digital system for selling physical goods, and already accounts for 9% of retail spending worldwide. To compensate for not being able to see and handle an actual product, e-commerce retailers provide elaborate digital avatars for the products they sell, as well as reviews based on first-hand experience written by ordinary consumers. Technology isn't yet advanced enough to deliver physical products digitally (for example, by 3D printing), so there are still warehousing and logistics problems to be solved. But e-commerce has been digitized to the furthest extent possible with current technology. As a result, e-commerce systems show considerable similarities with digital content and advertising systems.

> ## E-COMMERCE SYSTEMS SHOW CONSIDERABLE SIMILARITIES WITH DIGITAL CONTENT AND ADVERTISING SYSTEMS.

But what about brick-and-mortar stores? Let's start with promotions.

In-store trade promotions are broadcast: seen by everyone entering a store, regardless of their relevance and the benefit to the manufacturer. It's no surprise that Nielsen estimates only 33% of promotions make money, with the remainder failing to break even. We also estimate that the promotional spend of the most successful manufacturers is five times more effective than that of the least.[3]

Standard web tracking provides e-commerce retailers full knowledge of who bought what and when, and much of the why, too. This gives them the equivalent of a loyalty program without the need to enroll consumers, hand out cards, insist that they are used at the till, and so on. The completeness

of their knowledge about the effectiveness of promotions is considerably better than that in the physical world; loyalty programs never achieve full penetration, and on average only 60% of people with loyalty cards use them for a transaction. This has transformed online retail and advertising: because the store is virtual, the retailer can personalize promotions to the individual consumer. The virtual world is instrumented by default and inertia-free—it can be reconfigured moment by moment, consumer by consumer.

> ## THE VIRTUAL WORLD IS INSTRUMENTED BY DEFAULT AND INERTIA-FREE—IT CAN BE RECONFIGURED MOMENT BY MOMENT, CONSUMER BY CONSUMER.

We can reasonably imagine that this personalization will extend beyond just promotions. It's much harder to track consumers in the real world, but technologies such as location services, smartphones, beacons and smart cities, combined with the retailer's instrumentation of its own stores, will soon bring the physical world close to parity with online.

Once this happens, it will be possible to apply e-commerce techniques to brick-and-mortar stores. The consumer may even have their own personalized real-world store—created in augmented reality—with a product assortment, prices and offers uniquely tailored to them. This approach could eventually blur the distinction between programmatic ad targeting and personalized consumer offers and loyalty programs. As with e-commerce stores, in-store promotions might become an electronic marketplace like online advertising. Manufacturers would be invited to bid on prospects: "I have a high-value caffeine lover walking down the carbonated beverage aisle—who wants to offer a promotion?"

Digital will put individual consumers center stage in many retail processes. Instead of three musketeer-style "one-for-all" promotions, we'll see manufacturers and retailers responding to 80-20 effects: when they discover precisely which 20% of a store's shoppers generate 80% of its sales, and precisely

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[3] The Path to Efficient Trade Promotions. PDF. Nielsen, February, 2015.

which 20% generate 80% of its profits (not necessarily the same individuals). With those sorts of inequalities, sophisticated, personalized, algorithmic-driven pricing and promotion strategies will be crucial to digital success.

Digital will also encourage real-time execution, allowing a retailer to vary prices and promotions by time of day, activity in the store, promotions in neighboring stores and external circumstances like the weather. This data will be combined with information about consumer behavior (browsing products, viewing promotions, purchasing and so on) and fed into autonomous, self-learning systems with objectives and constraints that can tune the promotion over the course of the day.

While traditional stores are being digitized, Amazon Go, Walmart's 'Scan and Go' and other experimental retail formats are redefining what it means to be a brick-and-mortar store. At an Amazon Go store you walk in, pick what you want from the shelves and walk out. The instrumented store can identify you, detect when you remove or return products to the shelves and keep track of your virtual cart. When you leave, you're charged for the goods you've taken. Amazon hasn't revealed how this trick is done, but have mentioned computer vision, image recognition, sensors and machine learning—many of the same technologies found in self-driving cars.

U.K. grocer Morrisons is using some of the same technologies to automate replenishment of 26,000 fresh and ambient products in its traditional stores. Internal data (such as sales) and external demand-predicting data (such as weather and public holidays) are consumed by machine-learning algorithms, which make over 13 million ordering decisions per day. The system has reduced stock outages by up to 30%.

> ## THE TECHNOLOGY TRANSFORMATION, WHICH WILL PUT BRICK-AND-MORTAR STORES ON EQUAL DIGITAL FOOTING WITH E-COMMERCE WEBSITES, IS UNDERWAY.

The technology transformation, which will put brick-and-mortar stores on equal digital footing with e-commerce websites, is underway. Once this is complete, it will be possible to offer an online experience in store—especially if instrumentation is combined with augmented reality—in real time, in a uniquely personal way.

HERE TO STAY

Digital systems replace traditional measurement with instrumentation, so the system can react to changing conditions in near real time rather than waiting for something to be measured and analyzed. But that doesn't mean measurement isn't needed. Most digital systems are not self-sufficient and self-contained; they need a picture of the outside world, including their competition, to operate efficiently—much of which will come from third-party measurement.

Digital retail will likely lead to the creation of walled gardens similar to those in digital advertising. These will be crucial sources of information about consumers and consumption, but the issues experienced in digital advertising will apply. Third-party measurement will play a vital role in creating a total consumer view that encompasses walled gardens as well as "legacy" channels. Third-party measurement will also be necessary to avoid the potential conflict of interest of walled gardens "grading their own homework."
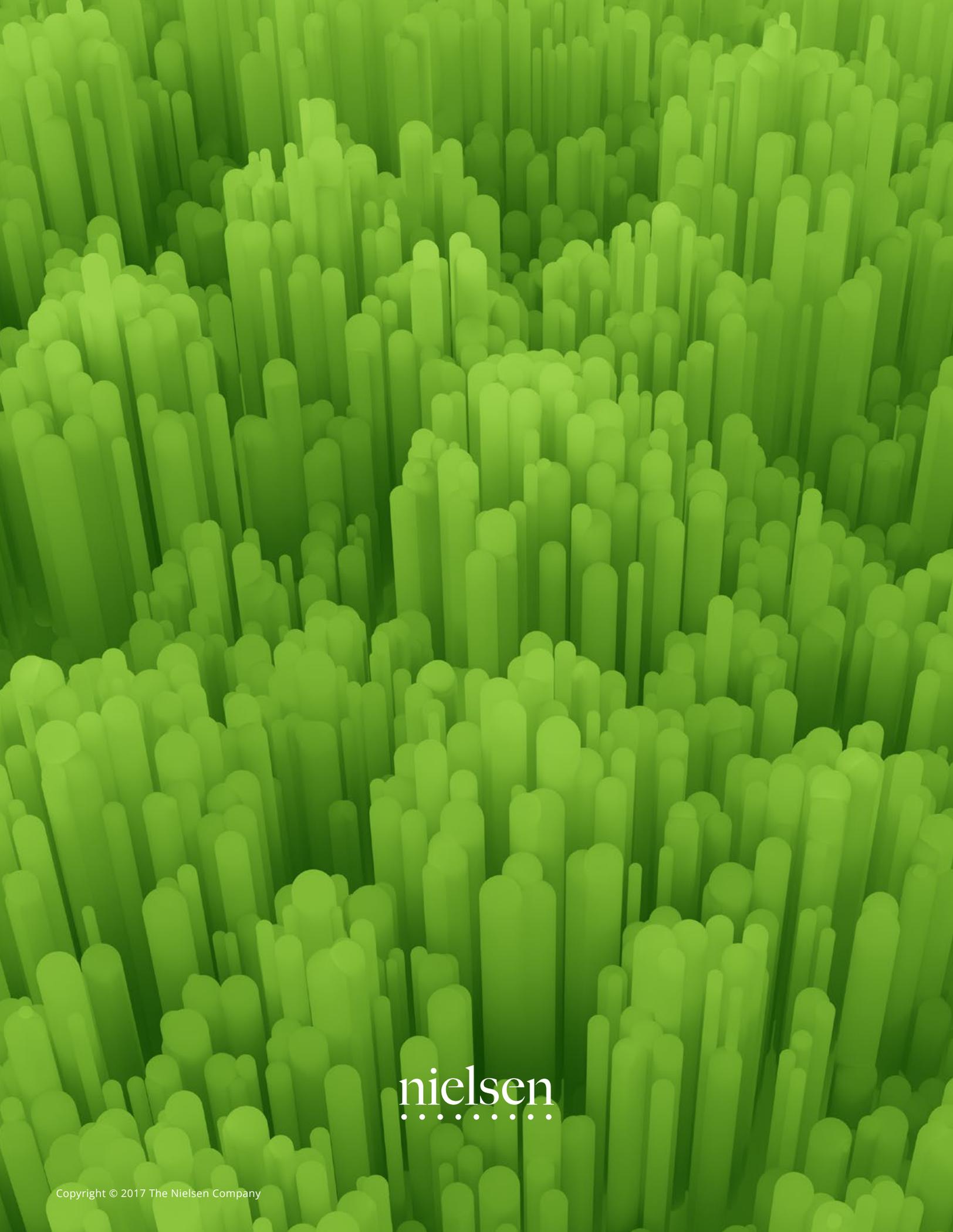
Digital retail will bring with it hyper-personalization—advertising, promotion, pricing and even store layouts will be customized at the individual level. Consumer-level information will become the most important measure in retail, replacing the point-of-sale data that has dominated for so long. Third-party measurement companies with experience using consumer panels for research will be a vital adjunct to data from the walled gardens, especially if some walled gardens choose to limit how much of their consumer sales data they share.

Digital will change everything, and a lot of routine measurement will be instrumented out of existence. But it is only human to want to exaggerate one's performance. Until humans are out of the equation, we'll still need third-party measurement.

ABOUT NIELSEN

Nielsen Holdings plc (NYSE: NLSN) is a global performance management company that provides a comprehensive understanding of what consumers watch and buy. Nielsen's Watch segment provides media and advertising clients with Nielsen Total Audience measurement services for all devices on which content — video, audio and text — is consumed. The Buy segment offers consumer packaged goods manufacturers and retailers the industry's only global view of retail performance measurement. By integrating information from its Watch and Buy segments and other data sources, Nielsen also provides its clients with analytics that help improve performance. Nielsen, an S&P 500 company, has operations in over 100 countries, covering more than 90% of the world's population. For more information, visit www.nielsen.com.

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