

TOP RETAIL TECHNOLOGY TRENDS IN 2021



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About Global Sources



INTRODUCTION

Recent years have seen retail move online in unprecedented ways, through a dizzying array of channels and a transformation of how consumers discover, choose and purchase. Behind the scenes, technological changes are redefining market research, logistics and more.

Top Retail Technology Trends in 2021 is an e-book from Global Sources that explores the ways in which technology is already changing retail, and the key developments coming down the line. These range from ways to utilize big data to create hyper-targeted marketing and personalized shopping experiences, to automating retail interactions, logistics and after-sales, to new possibilities in digital transactions and security.

ABOUT THE BOOK

Top Retail Technology Trends in 2021 highlights the tech trends that will be seen across the retail industry – from data mining to purchasing and payment interface through to warehousing and delivery to software and online applications.

The book offers traditional and online retailers alike invaluable insights on how adopting both existing and emerging retail technologies, including artificial intelligence, virtual reality, augmented reality and machine learning, as well as innovations in mobile apps and mobile payments, can help with their business' success.

Keeping sourcing professionals up to date with these trends is one of the ways Global Sources helps them make the right sourcing decisions. Visit globalsources.com to find more information resources and discover new sourcing opportunities.



OUTLOOK OF THE RETAIL INDUSTRY

Almost a year after the global breakout of COVID-19, the unprecedented health crisis appears to have accelerated the demise of traditional retailing while fueling promising shifts in retail technology. Interestingly, the pandemic seems to be pointing towards a kind of “singularity” in retailing – one where evolving technology might just reinvigorate, if not eventually reinvent, physical stores.

The social distancing and other physical restrictions triggered by the pandemic have been particularly damaging to traditional retailing. Almost six months after restrictions on travel and public movements were imposed, Forbes reported in August 2020 a dire roll-call of store closures in the US and beyond: 1,200 at Zara, 400 at Starbucks, 16 at Nordstrom, 200 at Bed Bath & Beyond, 125 at Macy’s.

As 2020 drew to a close, the fatality list for traditional retailing was becoming even more epic. By comparison, digitalcommerce360.com reported that online shopping platform Amazon was having a banner year: net first-party sales of US\$96.15 billion in North America for the quarter to end-September, up 37.4 percent from the same quarter in 2019. Globally, sales of Amazon's own merchandise surged by 32.8 percent for the same quarter year-on-year. Even more dramatically, fees Amazon collected from sellers on its e-commerce platforms jumped 54.7 percent for the same period.

So what's up ahead? Market analysts point to even stronger sales for online trading platforms that have deployed cutting-edge retail technology. However, the COVID-19 clouds may still have a silver lining for traditional retailers who are agile and adept enough to adopt both existing and emerging retail technologies.


According to a survey by Retail Touchpoints, senior retail executives will be focusing over the next few years on investing in new technology, connectivity and mobile tech. To put this in context, Gartner recently reported that in 2019 alone, retail-tech spending rose by 3.6 percent to US\$203.6 billion globally.





And where will these funds go? In an April 2020 report, Israel-based custom software developer United Perfectum projected that trending retail tech investments will be in artificial intelligence (AI), Virtual Reality (VR), Augmented Reality (AR) and Machine Learning (ML), as well as innovations in mobile apps and mobile payment.

These retail tech trends will be seen across the industry, from data mining and marketing to purchasing and payment interfaces, from warehousing and delivery, to software and online applications. Crucially, the most interesting trends will most likely converge in the emergence of a new generation of tech-savvy physical stores.



Male
Caucasian
185 cm
78 kg
Age 28

SMART DATA MINING

After the COVID-19 disruption, big data analytics will likely come of age for the retail industry in 2021, in the form of “deep retail” driven by AI. The extensive use of smartphones and browsers during the online shopping boom fueled by pandemic restrictions is expected to bear fruit for retailers who have invested in AI that allows marketers to mine tons of consumer data. Thanks to smart targeting of marketing budgets and much more efficient inventory, logistics and supply chain management systems, marketers are expected to save US\$340 billion annually in the years ahead, according to marketing research firm Tractica. With such huge savings and much heftier sales, retailers are tipped to invest even more in AI and in related tech such as 2D or 3D computer vision, AR and VR sensor technology, natural language processing, and robotics, Tractica reported.

AI is also expected to pop out from back-of-house to front-of-house, with greater use of customer-facing initiatives such as chatbots and virtual assistants. While inventory-management robots have been a mainstay in warehouses and stock rooms, they are expected to roll onto shop floors to assist customers, probably initially as novelty attractions, before becoming as common as self-help barcode readers.





The ramping up of 5G use globally is expected to lead to meaningful real-time business intelligence (BI) for much more accurate reporting, analysis, and planning. Additionally, 5G is also seen to be fueling the growth of the Internet of Things (IoT) in the retail sector, where cash tills, barcode readers, computers, CCTV and security sensors can “talk” with each other at blistering speed. This real-time IoT exchange of information and data analysis can then help accurately predict consumer behavior, optimize product placement and improve store operations.

SUPER-TARGETED MARKETING

Plugged into relevant customer data in real-time, online and traditional retailers are expected to intensify their geolocation marketing efforts. These initiatives are currently used to reach targeted customers with highly personalized offers and services, such as dynamic pricing and tailor-made promotions. Some retailers have also used geolocation marketing to strategically leave “breadcrumbs” that lead customers to specific products in both online and physical stores. Gartner vice president Tim Zimmerman expects this trend to intensify. “The customer’s smartphone provides multiple opportunities for geotargeting,” he said in a report by Gartner. “Indoor options include Wi-Fi, UWB (Ultra-Wideband), and BLE (Bluetooth Low-Energy), while for the outdoors, you can use cellular and GPS data.” Zimmerman believes retailers will power geolocation with AI to enable even more personalized marketing.





HYPER-PERSONALIZED SHOPPING

Of course, digital personalization for retail purposes isn't new. What is emerging is the use of AI and machine learning to enable hyper-personalization. With these two new tools, retail marketers hope to achieve even more consumer conversions from online store surfing to purchasing. After all, according to Internet statistics database Statista, more and more people now shop online, with about 14 percent of all commerce sales happening online. And this figure is projected to jump to 22 percent by 2022 – or even higher, thanks to the online shopping boom fueled by the pandemic.

Another big trend in retail technology that is expected to reinforce personalization is the huge strides in the field of natural-language processing for voice search purposes. Way back in early 2020, IT service management company Outerbox had already noted that, in the final half of 2019, more than 79 percent of digital consumers in the US bought online using voice search. Meanwhile, Gartner has projected that voice searches on Google will start rising from 30 percent of all online searches in 2020. The growing use of voice assistants such as Google Voice and Home, as well as Amazon Echo and Alexa, points to voice online searches becoming even more widespread. Interestingly, digitalcommerce360.com recently reported that 20 percent of the people who owned these devices used them largely for online shopping searches.

As retailers wake up to the growing acceptance – and commercial power – of online searches, software developers are working hard to make voice searches as simple as regular conversation. The ultimate aim is to enable voice search engines to understand and process natural language seamlessly. In this sector, emerging trends include AI-powered unsupervised and supervised learning, reinforced learning, semantic search, and cognitive communication.

Still in the area of the online shopping experience, expect breakthroughs in the field of “experiential” e-buying powered by AR and VR under the rubric of “Extended Reality” or XR. Using AR and VR, top online brands have been slowly adding high-tech features such as allowing potential customers not just to browse but also to “try” the items they’re eyeing to buy. First-mover brands in this area include Living Wine Labels from Treasure Wines Estates, IKEA’s ARKit (allowing e-shoppers to do virtual interior design), and clothing retailer Tilly (where shoppers “try on” clothes and accessories before deciding to buy or not).

In an October 2020 report, Danny P. Goel, chief executive of health-sector interactive VR and AR specialists PrecisionOS, predicted that the pandemic could bring a tipping point for XR technology due to forced social distancing, working and studying from home arrangements, and curtailing of travel. “XR directly reduces the feelings of isolation by returning the connection to others in 3D,” Goel said.

This view is shared by Courtney Christ, associate director of paid social at global media-agency network Mindshare. “Historically, AR and VR have been viewed as shiny objects in the media plan – the tactic that is attention-grabbing or innovative enough to win an award, but not necessarily a business driver,” she said. “That perception is slowly changing. Brands are increasingly thinking about how extended reality can provide more utility.”



In a July 2020 article, CommerceNext.com reported that more than 20 percent of US retailers invested in AR or VR for their online retail store in June 2020 versus only 8 percent in January 2020. And according to govtech.com, the US government website aiming to fast-track public sector digitization, the pandemic could accelerate Washington's adoption of AR and VR technologies. "As the demand for remote work extends from weeks to months, public sector agencies will need to explore tools such as VR and AR for improved communication and collaboration," it said.

In China, where COVID-19 emerged and the serious impact of the public health crisis was first seen, the adoption of VR and AR has taken on an extra sense of urgency. According to media reports, Beijing has started to direct huge investments to explore and implement ways to apply VR technologies in manufacturing, healthcare, education, and commerce. Beijing believes that Chinese companies can radically improve their design processes and quality of service by adopting XR technologies in research and development, maintenance, testing, and training in the manufacturing sector.



DE-PERSONALIZED SHOPPING



While hyper-personalization has become a mantra for some retailers, another big trend in retail technology is achieving the opposite - one where shopping has become automated and invisible. A few years ago, the idea that machines can “talk” with each other seemed absurd. In fact, when the Internet of Things (IoT) concept was first proposed by Kevin Ashton in 1999, the dominant idea was of an “embedded Internet” in the form of wired, intelligent communities. These days, IoT is as common as Wi-Fi.

According to Gartner, as of late 2020 there were already 14 million connected IoT devices, with 127 new gadgets added to the IoT environment every second. This adds up to about 25 billion connected devices by 2021, 41 billion by 2027, and at least 125 billion by 2030. In a 2019 report, Statista valued the IoT market at US\$1.7 trillion and was projected to grow by 17 percent in 2020.

The IoT connectivity of smart home appliances means that a refrigerator with sensors can detect if it is running low on milk or frozen peas. It can then “talk” with the smart home management system, such as Google Home, to contact the nearby supermarket or online delivery service and place an order for the said items. So while mom and dad are telecommuting and the kids are studying by teleconferencing, the household appliances are quietly doing the shopping, scheduling delivery and restocking.

One big enabler of the IoT infrastructure and economy is the interconnection among apps and devices through an application programming interface (API) – a bundle of programming code that serves as a bridge between two digital services. Like Bluetooth or shared programming language, the API allows an app on one device to access information or a service from an app on a different device. For instance, an API enables your smartphone to communicate with your wearable jogging pulse-rate device, allowing your doctor to monitor your heart rate or blood pressure during exercises. Gartner vice president Kristin Moyer believes that APIs could be the next big thing. “It’s an enabler for turning a business or organization into a platform,” she says. “Platforms multiply value creation because they facilitate the creation and exchange of goods, services, and social currency.”



The full impact of APIs on retailing is just starting to be evident, as the technology makes it easier to integrate and connect people, places, systems, data and algorithms.

APIs are also facilitating the creation of new experiences, the sharing of data and information, authentication of people and things, and the creation of new products and services, and business models. Crucially, APIs can democratize coding, especially for consumer-to-consumer or small-manufacturer to retailer transactions. The modular and portable infrastructure of APIs may soon make e-retail coding as easy as desktop publishing. In effect, anybody can set up his or her own private mini-Amazon.com on smartphones or join an e-mall of private mini-malls.



NEXT-GEN DIGITAL WALLETS

The retailing evolution from cash to credit cards to digital wallets is entering another stage, this time, with retailers hoping to use contactless payment systems to drive consumer behavior. Digital wallets have become increasingly common, as they allow consumers to make online payments conveniently and safely using their mobile devices and without the need for credit cards – thereby eliminating the risk of online fraud. To further maximize the commercial potential of digital wallets, retailers are expected to tie these high-tech payment systems to loyalty and reward programs to learn more about consumer behavior and spending habits. For instance, an online fashion retailer using AI-driven deep retail can track a particular consumer’s favorite holiday destinations by monitoring that person’s digital-wallet use (with the consumer’s permission, of course – and with loyalty points thrown in as an incentive, perhaps). This will allow the clothing retailer to customize special promotions on fashion and accessories in tune with the consumer’s preferences. Think of special discounts on bikinis and skincare for a consumer who likes going to the beach. Or offers of exclusive golf-tournament access to those who like teeing off on weekends.

AUTOMATED RETAIL CHAINS AND AFTER-SALES

Amid social-distancing restrictions and telecommuting as the emerging preferred way of working, automation has also increasingly become the default mode at factories and warehouses. Aside from controlling the potential spread of highly infectious viruses, automated warehouses and robotic store assistants – coupled with advanced computer systems – can help improve inventory control, thanks to reliable stock data in real-time. This translates to improved stock-flow management, with retailers able to predict demand much better. As a result, retailers can reduce wastage, improve productivity, and boost ROI.

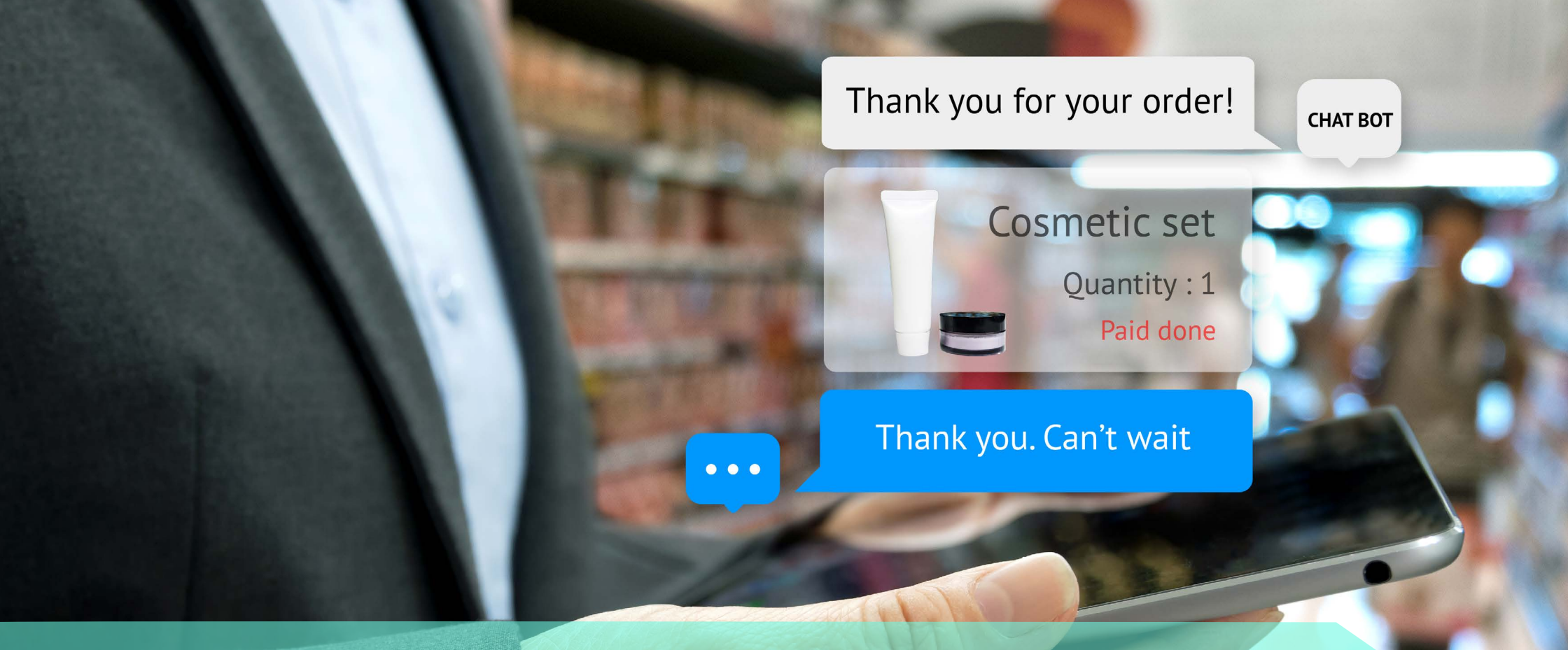
In tandem with robotics-driven warehousing, order fulfillment is also rolling down the automation route. Although this trend has been going on for some time now as a way of trimming labor costs, it has been accelerated by concerns over potential viral contamination due to poor hygiene at order fulfillment centers and delivery networks. Hence, renewed interest has been noted in the research and development of self-driving delivery vehicles and drone delivery. In California, for instance, the first commercial driverless delivery service by robotics start-up Nuro has been given the green light for early 2021. Using radar, thermal imaging and 360-degree cameras to direct its movement, Nuro's R2 self-driving delivery car has done trial deliveries for Domino's Pizza, Kroger supermarkets and Walmart in Houston, Texas. Its commercial rollout in 2021 is expected to open the gates for other driverless delivery services in the years ahead.





This shift is expected to be further fueled by AI to manage logistics and routing. To further drive efficiency, “digital twinning” is being adopted to tap into the strengths of sophisticated models of logistics and fulfillment operations. And to ensure security and transparency along supply chains, blockchain technology will also likely be deployed here, as discussed below.

Another retail tech trend increasingly promises to bypass the warehouse altogether, with consumers able to purchase from manufacturers directly. This development has been powered by social media influencers, whose clout can mean millions of dollars of sales for manufacturers. Although many thought this was a flash-in-the-pan phenomenon, the trend has trickled down into niche markets served by micro-influencers. The tech-driven supply chain innovation behind this shift is dropshipping – where customers can order and arrange for delivery directly from manufacturers after seeing products endorsed or promoted by social-media influencers or popular websites. Influencers are basically running a retail business without the hassle of buying stock or fulfilling orders, while manufacturers can bypass warehousing or avoid the deep discounts demanded by retailers.



Then there's the "shoppable TV", as tested recently by US network NBC. Effectively cutting out the traditional retailer as middleman, the technology notifies app users when products they see on screen in standalone commercials are available for direct purchase. The retailing potential of this platform is still being assessed, but expect it to be rolled out through sports coverage and entertainment TV, as brands look for new ways to engage with their digital audience.

The power of AI is also being deployed in the after-sales arena in the form of chatbots. With automation and data analytics integrated into their design, chatbots can take queries, perform searches, answer questions, and even refer special queries to human reps. But unlike their human counterparts who can get tired and cranky (and entail higher labor costs), chatbots can sound amiable 24 hours a day, seven days a week – with no toilet breaks.

DATA SECURITY UPGRADES

Another big trend in retail tech has been happening mostly behind the scenes but has huge front-page impact. In a recent report, the US Department of Homeland Security said that 90 percent of reported hacking or security incidents were due to weaknesses in application code and design. To make their apps near impregnable, developers have turned to proprietary development platforms instead of using open-source tools.

In the IoT environment, this means continuing trends in securing the three key elements of the IoT architecture: devices, connectivity, and the cloud. Device designers have been embedding trusted platform module chips to authenticate and protect endpoints, securing boot processes to prevent unauthorized code from running. They have also been busy updating security patches. Meanwhile, to ensure cloud and connectivity security, data engineers continue to work on complex encryption methods to block hackers. Other strategies to secure the IoT environment include end-to-end data encryption, device authentication, and access control.



Although it has made a far bigger impact in financial services so far, blockchain technology is expected to overhaul the retail industry as well. Aimed at speeding up transaction processing time, increase transparency and security, and help resolve disputes, blockchain technology has been predominantly used in banking, supply chain, logistics and insurance sectors. Many experts believe that blockchain will be at the heart of a fourth industrial revolution. Statista has valued the global blockchain market at US\$3 billion and expects this to grow by 67.3 percent annually over the next five years to US\$39.7 billion in 2025. Blockchain has been the driving force behind the growth of Bitcoins, but it has now been deployed to cover smart contracts, bonds, loans, services and, increasingly, physical products. The last one is expected to have a big impact on retailing, especially for high-value and big-volume transactions.



LET'S GET PHYSICAL

According to United Perfectum, while e-commerce is expected to continue growing at a blistering pace, it won't be at the cost of brick-and-mortar stores any more. Instead, the Israel-based custom software developer sees online and offline retail finding ways to coexist profitably. As demonstrated by the Amazon 4-Star stores and its sister brands, online retailers are projected to expand into the physical realm by setting up actual shops. Meanwhile, traditional brick-and-mortar stores will continue finding ways to bridge the online-offline divide. In the US, retail giant Walmart has been doing this by allowing shoppers to walk into their nearest Walmart physical store, select items from the shelves or from on-site computer screens (so shoppers can choose items not available at that particular store), and have the items delivered to their chosen Walmart location.

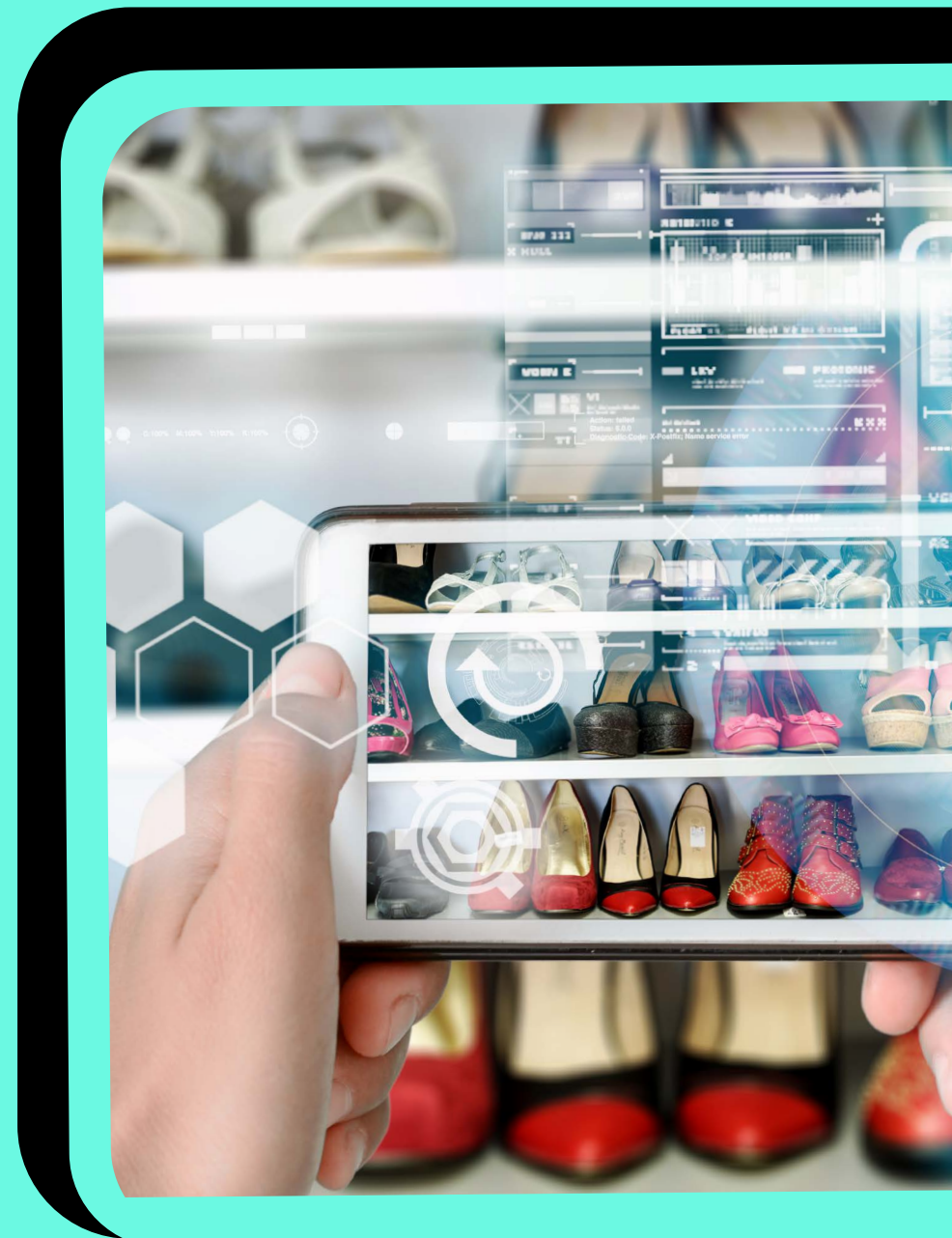
“Offline is online, online is offline – this is omnichannel,” said Bernard Marr, an international best-selling author, popular keynote speaker, futurist, and strategic business and technology adviser to governments and companies. “This is a big one, that actually involves the coming together of several different trends, including AI, robotics, IoT, and extended reality – which includes virtual and augmented reality.”



Pushing from the opposite direction of the online-boosting impact of the pandemic, this omnichannel trend has been driven by the preference among Gen Z shoppers to make connections and engage with a community. Perhaps reacting against social-distancing curbs, young shoppers want to chat with their friends or engage with store staff. According to a survey by Retail Zipline, a US company that helps brick-and-mortar stores streamline communication and task management, people still crave an authentic experience, despite the emphasis on fast delivery times.

To make this happen, online retailers have been using VR environments to provide immersive, feature-rich shopping experiences. At the same time, offline retailers are deploying AR to allow customers to access information about products they find on the shelves, among other features. In the US, AI-powered technology has been used to support virtual try-on experiences, as shown by the highly successful “magic mirrors” at Uniqlo and MAC. This has also enabled physical retailers to drop the need for a backstock of products in every possible style, color or size.

The anticipated drop in commercial rents in the wake of retail-store shutdowns could also goad online retailers to venture into the real world, shifting from digital to minimal but tech-heavy stores offering maximal customer experience. This has been pioneered by Amazon’s various shopfront ventures via Amazon Books, Amazon 4-Star, Amazon Fresh, Amazon Pop-Up, Amazon Go and Amazon Go Grocery.





Furthermore, digital-native retailers can use physical stores as their local distribution centers or digital touchpoints. “Your retail space also gives you opportunities to hold events and promotions that wouldn’t be possible if your only storefront was digital,” best-selling author and Courageous Leadership co-founder Rhett Power wrote in an article for Forbes.com in March 2020.

Virtual-conferencing platforms such as Zoom might challenge Power’s insight, but digital meetings probably cannot replace the flesh-pressing immediacy and effectiveness of real meetings, despite the demands of social distancing. In a September 29, 2020 podcast interview with Wall Street Journal bestseller author Michael Gale, US retail industry thought leader and former Old Navy vice-president Courtney Hawkins said: “We could see micro-fulfillment centers like mini Amazon warehouses. The mall could be seen more like a community experience – exercise, movies, food, medical and education.

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MISSION

Connect authentic buyers and suppliers worldwide with tailored sourcing solutions and actionable market intelligence. Help them meet the rapidly changing dynamics of the global trade, source more effectively and seize new opportunities

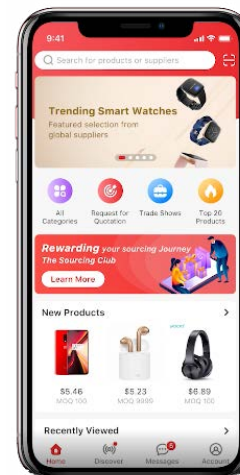
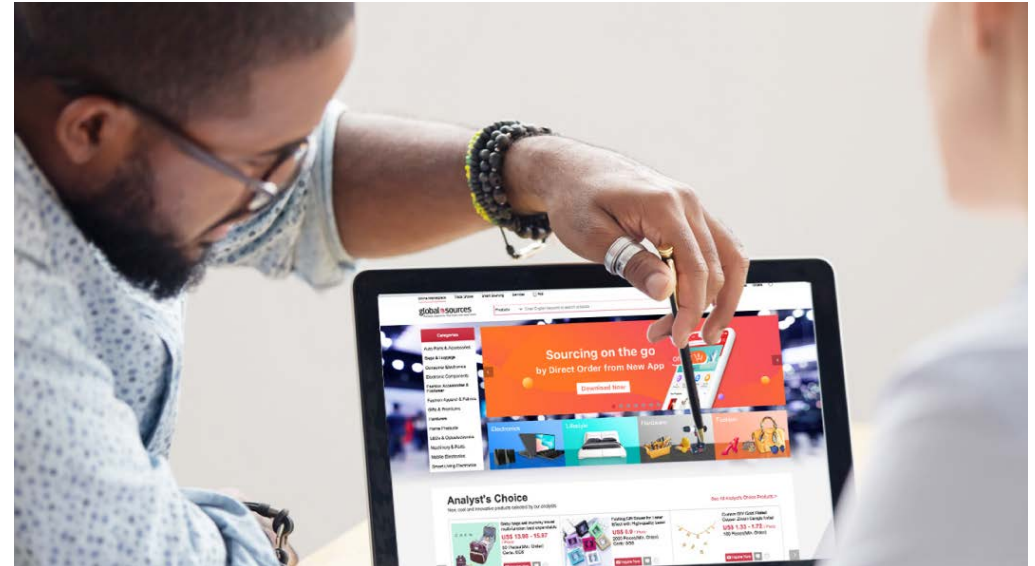
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