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# Note on the Future of Commerce

In 2018, the Amazon Go store on the corner of 7th Avenue and Blanchard Street in Seattle, Washington offered shoppers a peek into what the future of retail might look like. The convenience store was unlike just about any other store in the world. To enter, customers had to scan the Amazon Go mobile application (app) on their smartphone. Once they got inside, a system of cameras and sensors could detect what products they picked up off the shelves (or changed their minds and put back). Real-time data collection paired with existing data about each consumer drove real-time marketing, offer communications, shelf navigation, and more. When people finished shopping, they just walked out, and Amazon would automatically charge their accounts for the products that they carried out of the store with them.[1] This first Seattle store, located on the ground floor of one of Amazon's office buildings, first opened to Amazon employees in 2016 and then opened to the public in early 2018. It was among the first physical stores designed as both a convenient retail store as well as a consumer and product insight generator. The store was about more than the merchandise sold. Data collection drove algorithms in real-time to direct customers to interact across all of the Amazon touchpoints. By 2018, other retailers, such as Alibaba and JD.com, had created a version of these automated stores, heightening the pressure on prior generations of retail to re-think their business models, their capital allocation, and their workforce.

Whether or not the Amazon Go store (and its increasing number of replicas) was an early indicator of the future of retail, it was undeniable that the store had arrived at a time of great change within the over $25 trillion global retail sector.[2] The retail industry had already gone through significant changes. Major generational shifts had occurred over the past 50 years as the industry first developed large dominant chain stores and then began to digitize. By 2019, e-commerce made up nearly 14% of global retail sales.[3] As digitization spread through retail, it meant more than simply selling products online—it changed the nature of the physical store, it changed shopper behavior, it changed the financial model of retailers, and it changed the value chain that supplied goods to shoppers.

This Note aims to: frame and explore the macro-trends impacting retail as of early 2019; explain the significant disruption occurring across the retail value chain (including consumer brands, distributors, and retailers); outline the capital, talent, and business model changes retailers have undergone over time; and highlight the significant choices that executives faced in 2019. This Note is based on the experience and insights of note co-author Daniel O'Connor, founder of the Future Commerce Initiative and Visiting Executive at Harvard Business School. He has advised leaders of large-scale retail companies and the organizations that supply them for many decades.

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The transformation pathways of the retail industry differed by country. In some developing countries, such as China, the transformation occurred faster, because there was less infrastructure to supplant. Even in some developed countries, such as South Korea, the transformation occurred quickly. Many of the example companies in this Note are U.S.-based, but they are representative of international trends. (See **Exhibit 1** for statistics on e-commerce penetration of retail sales by select geographic markets.)

## Roles of Retail Stores

Retailers sold goods to shoppers. Sometimes retailers produced these goods themselves. More often, retailers acquired their merchandise from manufacturers or wholesalers. For most of the history of the industry, the main retailing channel was the physical store. Retail stores played several roles that provided value to consumers and goods suppliers:

**Distribution**   Shoppers sought retailers from which they could acquire the selection of goods and brands that they desired at an acceptable price and with sufficient convenience. Stores served as a distribution node between product suppliers and shoppers. Retailers acquired bulk quantities of goods and tailored them into smaller quantities for stores. They used stores as a link in the value chain that received truckloads of inbound merchandise through back rooms that, in turn, quickly flowed through to the sales floor, where customers browsed and bought.

**Merchandising**   The activity of selecting, displaying, and promoting the sale of goods was called merchandising. Merchandising dramatically influenced shopper behavior. For example, apparel retailers curated clothing products that they believed shoppers would enjoy and often displayed full outfits together to educate shoppers about potential fashion choices. Goods suppliers valued retailers' ability to merchandise products well.

**Marketing**   Retailers engaged in marketing to attract consumers to their store and convert them to buyers. A store's addressable market ranged from five city blocks to a 20-mile geographic range around each store. Nearby households and businesses would receive price-oriented print ads, see outdoor media like billboards, and hear broadcast media messages to draw them to the store. Once inside the store, a shopper would see several forms of signage, product demonstrations, or promotional flyers. A few retailers had loyalty programs that provided customer-specific information to support personalized offers and messaging.

**Proximity to Demand and Supply**   Real estate decisions counted among the most important in store-based retail. Location defined a store's addressable market. Locating proximate to relevant population centers was vital. Store locations near highways and other high-traffic areas made it easier for delivery trucks and consumers to reach retailers quickly.

**Store Experience**   The longer a consumer dwelled in a store, the more money they tended to spend. The store experience itself—the fixtures, lighting, flooring, signage, entertainment, food options, and more—created value for the products and services sold within. Fostering an enticing atmosphere and positive shopping experience encouraged shoppers to return to a retailer for repeat visits.

**Community**   In many places, stores served as a meeting place and gathering place for community members. Parents often knew local storeowners and cashiers at the shops they frequented. Teenagers often gathered with friends at local malls and other shopping centers.

*Responsive Store Networks*

Store networks were very capital-intensive. They took years of planning to open, and they were very hard to change once complete. Moreover, store networks were labor-intensive and provided many jobs. Retailers and communities expected stores to operate for 20 years or more with a light refresh every six to eight years. However, the communities they served often changed demographically in as short as a decade. New competing business models or shopper behavior might arise even faster. When those changes occurred, a store would often struggle to respond.

*Relationships between Retailers and Brands*

Retailers created value for consumer brands and suppliers of consumer products ranging from shampoo to watches. Brands usually lacked retailers' direct access to shoppers. As such, they depended on retailers to order bulk quantities, to hold inventory, and to ensure their products were available, sufficiently stocked, visually merchandised, priced competitively, and promoted appropriately. Brands provided favorable terms to retailers that excelled in these dimensions and moved large volumes of product.

## The First Three Generations of Retailing

The retail industry went through major changes in the late 20th and early 21st centuries. While business models had endured decades in the past, they now shifted over the course of mere years. O'Connor explained:

> A retailer's journey to scale often followed an S-curve, beginning with low household penetration and then accelerating share over time. Over time, new competing business models appear, especially in times of significant economic, technological, or societal change. The legacy businesses often fail to jump from the old to the new model. As a result, they lose market share, cede competitive advantage, and even die off. In our terminology, we use the term "generation" to signify these major transition points.

O'Connor outlined the most recent generations of the retail industry (see **Exhibit 2** for retailing generations):

**Generation One (G1): The Independent Store**     Prior to 1970, single store operators—called "independent," "traditional," or "mom-and-pop" trade—dominated the retail scene in every country. This generation of retail was characterized by a preponderance of neighborhood-based, low-scale, smaller stores. Their customers and suppliers were generally local. Without the benefit of scale, they relied on wholesale distributors for supply rather than buying inventory directly from manufacturers. Most created value through localized product assortments, proximity (convenience), credit, and community relationships. In 2019, these stores represented about half of all retail sales globally, even though they had minority market share in the U.S.[4]

**Generation Two (G2): Big Box and Specialty Retail Chains**     Some mom-and-pop stores expanded into large regional, national, and international chains. For example, the Sound of Music stereo store grew from one location in St. Paul, Minnesota into the Best Buy international electronics store chain, and Walton's store in Bentonville, Arkansas grew to become Walmart; several other major retail competitors followed a similar path.[5] This expansion of chain stores was very strong in the mid-to-late 20th century. Compared to mom-and-pop shops, retail chains had widely recognized branding, owned more of their supply chains (fewer distributors), offered a consistent in-store experience, and

provided expanded assortments across locations. As these chains expanded their geographic footprint, their volume per item grew. With that additional volume came the ability to negotiate better deals from suppliers and realize significant supply chain efficiencies. They ordered full trailer loads of goods and spread administrative expenses across a growing store base. They passed savings on to shoppers in the form of lower prices. This created a virtuous cycle, or "flywheel," through which greater scale drove lower prices that then drew in even more customers and even greater scale. Running many stores also allowed management to test merchandise, pricing, and display ideas in a few locations and then quickly scale successful initiatives across stores. Consolidation ensued. These retailers gained share from G1 retailers. By 2018, they controlled about 30% of retail globally and had majority market share in developed markets, such as in the U.S.[6]

**Generation Three (G3): Initial E-Commerce**   In the late 20th century, the growth of the Internet enabled the rise of new business models: pure-play digital (e-commerce only retailers) and multi-channel retailers (store-based retailers with digital capabilities).

Early e-commerce entrants, such as eBay and Amazon, amounted to searchable listing services, through which buyers and sellers could connect. Each evolved and soon operated like an older retail model: catalogue shopping. Shoppers would visit a digital retailer's website and see categorized item lists, item pages with pictures of a product, its price, any promotions, a checkout page, and payment method. After purchase, the shopper would receive the product via delivery. However, these websites had several advantages compared to catalogues. They allowed shoppers to navigate an essentially unlimited selection of products, allowed visitors to read reviews from other shoppers about those products, and allowed the retailer to capture real-time data from shopper clicks to improve and personalize the shopping and marketing experience. As the early pure-play digital companies found success online, many store-based retailers added digital commerce capabilities to become multi-channel retailers.

Another new business model was the digital intermediary. Companies operating this model, such as Facebook and Google, were not retailers buying and selling goods directly. Each attracted large audiences and aggregated millions of consumers. Just as 20th century retailers invested in real estate and broadcast marketing to attract shoppers to physical stores, early 21st century retailers attracted shoppers by investing in content or advertisements that could secure relevant placement on an intermediary.

The third generation of retail created and captured value in new ways. Consumers often found shopping from home or work to be more convenient than taking a trip to a store. Digital retailers could offer a larger assortment of products than even the largest brick-and-mortar stores. Shoppers enjoyed more transparency on price and reviews when shopping online. The shopper experience improved through more personalized real-time interactions with digital retailers, intermediaries, and brands. For some categories, such as book sales, this powerful combination of advantages enabled e-commerce to achieve high penetration. For other categories, such as fresh food sales, people found the in-person shopping experience to be superior, so e-commerce penetration remained muted (see **Exhibit 3** for e-commerce penetration by category). For all categories, new G3 models and entrants reshaped consumers' expectations.

*G3 Marketplaces*   Some e-commerce companies sold only their own inventory, while others acted as "marketplaces," allowing third-party sellers to sell on their sites. Third-party sellers competed with a retailer's own sales, but they enabled the overall marketplace to offer a significantly wider selection of products and additional inventory. (See **Exhibit 4** for the growth of third-party selling.) The marketplace could charge the third-party sellers for services that facilitated sales.

## Leadership Challenges in Entering Generation Three

G3 growth compelled the previous G1 and G2 retailers and their entire supply chains (suppliers, transport, distribution, and stores) to respond. Many retailers pivoted to a multi-channel model—to "jump on the G3 S-curve" by building e-commerce capabilities while managing their physical retail operations. These leaders faced common challenges in managing the transition:[a]

**Cultural Resistance**    Many G2 organizations initially resisted digital commerce. Culturally, many levels of the organization viewed G3 retail as "online verses offline." As digital sales grew across merchandise categories, formerly profitable stores would often lose sales, de-leverage, and even lose money. Many workers viewed digital commerce as a threat to their employment, current skillsets, and compensation. Resetting expectations to match the new reality was very difficult.

**Competing Goals**    G2 retailers had to deliver near-term profit expectations with their existing business model, while concurrently investing in digital transformation. Leaders could not prioritize one goal over the other; they had to pursue both. Shareholders often resisted any interruption of current earnings and resisted re-allocation of capital or talent, while also worrying about lost market share. Moreover, these G2 businesses often bore a higher cost of capital than their faster-growing competitors. Senior executives had to quickly reset their corporate norms, re-skill, and realign leadership to manage the expectations of the consumer, their workforce, and their investors. At the same, they had to manage the new G3 metrics of success.

**Speed of Commerce**    Decision cycles shortened, and retail moved towards real-time customer interactions. Digitized retailers were winning share with real-time product availability and marketing, promotions, and more. Shoppers expected faster and faster order-to-delivery times with instantaneous confirmation that merchandise was in stock. At the same time, business partners, such as brands and advertising partners, expected fast decisions, often including inventory forecasting or media purchasing decisions. Retailers found it difficult to accelerate their speed of commerce due to major legacy investments (e.g., stores, warehouses, and trucks), organizational structures (e.g., consensus-driven matrix organizations),[b] existing data systems (e.g., periodic inventory updates), and prior economic models (e.g., financing sources).

**Marketing to Attract and Retain Shoppers**    Historically, physical stores attracted foot traffic through convenient location, awareness marketing, and positive customer experience. Attracting digital traffic required different capabilities. Retailers needed visibility on major digital intermediaries. They struggled to efficiently attract digital traffic, retain digital shoppers, and to estimate individual customer acquisition costs or lifetime value. Furthermore, few succeeded in scaling their websites or apps to any meaningful number of visitors as customer acquisition costs continued to rise.

**Marketing Data Sets and Skills**    Relatedly, marketing organizations had to acquire new data and master new data management and analytics skills. G2 marketing organizations often did not know their customers' names or have access to their total spending at retail, social connections, or other

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[a] Many companies that began with pure-play e-commerce also opened up physical stores and faced their own challenges.

[b] A company with a "matrix" structure was an organization in which many employees reported to multiple supervisors for different responsibilities. In a consensus-driven organization, decision-makers sought wide consensus and buy-in before enacting a decision, which ensured a degree of deliberation and prudence. Matrix organizational structures facilitated—but did not necessarily create—consensus-driven cultures.

personal data.[c] Using their digital interface with customers, G3 competitors found it easier to acquire and integrate much of this data into large-scale personalization efforts. G2 organizations strived to match their digital competitors' data and analytics capabilities to achieve personalization at scale.

**New "Moments-of-Truth"**  In the consumer sector, the "moments-of-truth" were the key instances in the shopping journey that influenced product purchase decisions. In G2, the key moments-of-truth had been when a browser first noticed product packaging on store shelves and then when a consumer used the product. In G3, digital content became the shopper's first go-to resource in critical categories such as health, beauty, baby, decorating, etc. Search engines, social, marketplaces, brand sites, and influencers became key moments-of-truth. Packaging previously designed for the store shelf for the first moment-of-truth did not have the same effect on digital shoppers. The moments of delivery and opening packages also became key moments-of-truth. Delivery companies such as Cornershop, Deliveroo, and Grubhub greatly influenced the customer's experience. Purpose-built packaging that could thrive through the delivery experience could be as important as the quality of delivery itself.

**Additional Transparency**  The ease of online price and product comparison made it more difficult for retailers to price or promote differently across markets and stores. Digital-only retailers often led with national low prices on the highest volume items, while most G2 retailers often priced using localized zones. The ability to price by category and by geographic zone (rather than a single national price) often generated over 40% of many G2 retailers' profits. Shoppers also grew to expect transparency of on-hand inventories, delivery timing, and other related customer services. Retailers competed to provide this transparency.

**Fulfillment—Managing Digital Orders Using Stores**  G2 distribution networks were designed for pallet and case shipments at scale. G3 introduced picking single-items for shipment, a higher cost and more complex process. Many retailers picked and packed orders at national or regional fulfillment centers or local pick centers ("dark stores"). Several retailers attempted to pick-and-pack digital orders inside their stores while shoppers were present, which could theoretically make greater use of existing assets. However, these were difficult efforts. Few retailers knew on-hand inventory at the store and item level.[d] Most had to add extra labor and new workflow tools to fulfill the orders. Moreover, customer service was difficult when store pickers would often interrupt the in-store shopper.

**Order Economics**  Orders initiated online often had unfavorable economics for retailers. Key profit factors were the average order size, product mix, time and distance traveled, added price transparency, as well as higher credit card fees for online versus offline payments. The biggest variable was the cost of delivery, which could exceed 30% of the order value and in many cases accounted for over half the additional cost of a digitally initiated order. Taken together, the digital commerce costs often exceeded the margin of the order, especially when large bulk, heavy, or temperature-controlled items were included. The new G3 digitized model made many formerly profitable transactions

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[c] Some used loyalty programs to collect personal and spending data. However, loyalty data was limited. Only a subset of shoppers participated ,and this collected data did not include a full profile of the shopper or helpful information such as where else they shopped.

[d] This level of inventory data was called perpetual inventory. Unlike store-based retailers with finite assortments, digital retailers had to maintain perpetual inventory records from the very start. This way, digital retailers could locate and assign merchandise when sold. These perpetual inventory methods initially provided significant advantages over the store-based competitors who tried to catch up.

unprofitable.[e] Pure-play e-commerce companies were often less profitable than physical retailers, but their investors provided capital to achieve fast revenue growth and long-term scale, as opposed to pursuing near-term profits. (See **Exhibit 5** for an illustrative item economics comparison.)

*Leadership Challenges for Brands in Generation Three*

Retailers were not the only companies that faced challenges with the rise of G3 commerce. Retailers pressed their economic pressures back on suppliers, especially brands. Like retailers, brands had to deal with the same increased speed of commerce, price transparency, and changing moments-of-truth. In addition to these challenges, brand owners also faced some additional challenges in selling through G3 retailers:

**Competing Beyond the Shelf** Physical retailer shelf and display space was limited and could only show so many products. Retailers often chose to give prominent shelf placement to leading well-known brands. Major brands could dominate these shelves, leaving little space for smaller competitors. Conversely, e-commerce retailers had unlimited shelf space, which supported smaller brand competitors. Moreover on most e-commerce sites, each product would get only one item detail page, even when those same products might get as much as 24 feet of shelf space in a physical store.

**Agile Online-to-Offline (O2O) Competition** Micro-brands, such as Dollar Shave Club or Casper, launched products intended for digital-first distribution. These companies gained attention on digital marketplaces and through intermediaries. They often sold products directly to shoppers on their own websites, bypassing the G1 and G2 retailers. These new brands' advantages included how they were structured and operated. They could often alter product versions, packaging, offers, and messaging quickly based on consumer response. They built organizational structures that were designed to **make** alterations based on new information—"learn and pivot"[f]—quicker than older incumbents. As they scaled, many micro-brands migrated to include store distribution. This online to offline migration challenged traditional brands as retailers substituted these newer brands to increase store assortment, relevance, and trendiness.

**Item Profit & Loss (P&L)** For the first time, brands confronted live information about net profitability of their products to retailers at the individual item level. Spencer Millerberg, an entrepreneur in retail business intelligence, explained:

> Previously, brands had seen a partial P&L, limited in view with 'Peanut Butter' spread accounting for a retailer's largest costs such as building costs, labor, etc. But, with Amazon's item level accounting, every touch, discount, and shipment cost is tracked and could now be attributed to the individual sale and the associated product P&L it rolls up to. While this kind of cost accounting had been routine in the supplier world for quite some time, no other retailer had yet implemented item level accounting at scale.

Amazon and other G3 marketplaces used these new P&Ls to negotiate entirely new terms and conditions with brands. This was something that surprised the supplier community. These new terms

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[e] There were important exceptions. Profitable e-commerce products tended to be those with large orders or items with low weight, low cube (spatial dimensions of the item including packaging.) requirements, and high dollar value—for example, jewelry or apparel.

[f] The "learn and pivot" mantra referred to the practice of launching fast experiments into the marketplace, learning from shopper response, and incorporating those learnings into subsequent experiments. Many practitioners believed that this practice provided an advantage over the alternative approach of waiting a long time to get a product launch or advertising campaign exactly right the first time.

and information became catalysts for brands to move marketing spend away from traditional campaigns and towards the digital marketing capabilities of marketplaces like Amazon and Alibaba.

**Maintaining and Leveraging Scale**     G2 retailers often concentrated huge volumes of demand on a select few brands—called "power brands." This strategy provided economies of scale, especially in managing logistics. The G3 marketplaces had a long-tail of brand options. This provided shoppers with selection and personalization but fragmented volumes, adding more suppliers and higher costs per item.

**Loss of Impulse Sales, Lower Attachment Rates**     When shopping in-store, consumers would often buy additional unplanned items on impulse. These "impulse sales" could account for as much as 30% of large stores' sales. Consumers generally shopped online with greater precision, thus skipping or reducing impulse purchases. Candy, gum, magazine, snack, and other impulse-based brands had to fight to replace these sales as shopping moved online. Similarly, in categories such as printers, consumers resisted offers to add replacement cartridges and cables when buying online.

**Marketing Through Algorithms**     For decades, brands understood that in-store merchandising and promotions could drive demand for their products. To get the best in-store treatment by retailers, brand salespeople developed tight relationships with retail decision-makers, and brand marketers used human creativity to develop advertising. G3 marketplaces operated differently. These platforms often used algorithms to decide which products to show customers. The platforms also offered real-time advertising platforms. Often, these were programmatic and algorithm-driven. Brands quickly learned that they could not alter these algorithms' method of making decisions through human connection, so they had to influence the input data to the algorithm. To do so, the brand organization had to hire new data-oriented talent and develop new performance marketing skillsets—a challenge that was complex and critical to marketers' work on G3 marketplaces.

## Generation Four (G4): The Next Wave

In 2019, the fourth generation of retail had begun to take share from and re-shape the generations that came before it. The fourth generation was characterized by large-scale digital platforms. Each had massive user bases; many had daily interactions with over one billion consumers daily. They engaged these users in multiple ways, often through a unified "super app" (defined below), providing rich data to the platform owner.

In 2019, China's Alibaba Group served as a leading example of a developed G4 platform. Other companies—including major competing retailers and platforms, such as Tencent, Facebook, Google, Amazon and Walmart—followed suit to achieve G4 capabilities. They made massive acquisitions and investments in e-commerce, gaming, social sites, delivery, financial, and other services networks to match the G4 leaders' large audiences, customer data and analytics, and to create a similar low friction consumer experience. Importantly, they tended not to invest in current earnings, instead investing today for the right to earn profits in the G4 future. These investments were the beginning of a transition to a new generation of commerce, G4 platforms. (See **Exhibit 6** for a comparison of platforms to initial e-commerce.)

G4 retail platforms that created and captured value differently than their retail predecessors:

*G4 Platforms Creating Value in New Ways*

**Multi-marketplace and Multiple Customer Touchpoints**   Retail platforms aggregated different marketplaces, entertainment, payment, and other capabilities with unified corporate ownership, governance, and data. For example, Alibaba ran Taobao (a consumer marketplace with free postings), Tmall (a consumer marketplace with paid branded postings), Alibaba (a business-to-business marketplace), along with other marketplaces and consumer-facing services, such as news and entertainment. (See **Exhibit 7** for Alibaba's portfolio of companies.)

**Super Apps**   While all G4 platforms developed multiple touchpoints with customers, the most expansive platforms developed full "super apps." Super apps combined a large array of services into one. For example, the Alibaba Taobao app combined social features with entertainment shopping, travel, reservations, and payments. Super apps reduced or eliminated the need for consumers to open or flip between different apps. Super apps generally had less friction between services and higher customer retention than separate apps.

**Unified, Personally Identifiable, Real-Time Data**   G4 platforms used their many daily touchpoints to collect personally identifiable and granular data on each consumer, such as location, clickstream, purchases, and personal tastes. The user's telephone number was the common identifier allowing unified tracking across touchpoints. This permissioned data was used to more efficiently manage inventory, recommend merchandise, and provide personalized marketing and shopping experiences. (See **Appendix A** for different models of unification.)

For example, Daniel Zhang, CEO of Alibaba Group, explained his view that Alibaba's different businesses operated as a single platform: "We don't see any of our businesses as a standalone business. We view them all as use cases to generate data. We generate data by providing common infrastructure. [. . .] We refuel the value we create from the data to the ecosystem, to these use cases."[7] Zhang identified the common infrastructure as logistics, cloud computing, AI, and payments software.[8]

**End-To-End Integrated Supply Chain**   Retail platforms were architected as end-to-end integrated value and supply chains, meaning that the same data, analytics, views, and communication tools could be shared at each step of the value chain. Different steps in the value chain could often see data changes at other steps.

By comparison, supply chains for earlier generation retailers required high levels of human involvement. For example, retailers often created sales forecasts with suppliers who in turn did the same with their suppliers and so on. These were not unified processes. They were error prone, created misunderstanding, and slowed commerce. G4 platforms increasingly automated these processes, skipping human-managed forecasting in favor of shared data and algorithmic coordination. The retail platforms often took equity stakes in upstream and downstream partners to ensure that each party would coordinate strategies and unify data.

The supply chain integration was increasingly global. Inventory across marketplaces could be pooled together. For example, the U.S. retailer Office Depot collaborated with Alibaba to offer online customers access to combined product inventory. In China, some retailers, including JD.com, and Walmart fulfilled customer delivery orders from each other's stores.

*G4 Platforms Capturing Value in New Ways*

Just as G4 platforms created value in more and different ways than previous retail generations, they also captured value differently. Retailers traditionally profited from gross margin on the sale of

merchandise to shoppers. However, G4 platforms monetized differently. G4 required massive infrastructure investments in logistics, customer engagement, personalized data, software, and computer hardware. Retail platforms often chose to rely less on merchandise profits and more on fees for access to their ecosystem and services. For example, Amazon often made lower profits on merchandise. Keeping prices low encouraged customers to shop. Amazon then re-sold its logistics network (Fulfilment by Amazon), data storage and management and software (Amazon Web Services), and marketing services using customer data (Amazon Advertising). While Amazon initially built each of these for its own use, it eventually monetized them by renting to others. These new revenue streams created an entirely new generation of retail competitors not dependent on merchandise margin alone.

### Other G4 Platform Trends

Beyond the core attributes of G4 platforms, several other trends were common to these companies:

**Membership**   In 2005, Amazon launched a loyalty program called Amazon Prime. Prime initially cost subscribers $79 per year for unlimited two-day shipping on a range of Amazon merchandise. Amazon added many other Prime membership benefits, including music, video entertainment, faster delivery in some markets, and a holiday of discounts called "Prime Day." By 2019, this combination of benefits allowed Amazon to surpass 100 million Prime memberships.

The Prime business strategy had several advantages for Amazon. In particular, Prime paid for Amazon's investments in logistics and last-mile delivery.[g] Prime also increased customer spending on Amazon. The typical Prime member purchased over three times more goods on Amazon than the typical non-subscriber did in 2005.[9] Prime also served as a customer retention tool. Digital businesses had to balance the cost of customer acquisition with lifetime customer value. The greater the ability of a business to retain customers, the more it could spend on customer acquisition and the faster it could grow. Prime's bundle of services created a sticky relationship between Amazon and its customers, increasing retention and lifetime value. Other retailers, such as Best Buy and CVS, attempted to copy Amazon's Prime program. Amazon also created segment-specific programs, such as Amazon Mom and Amazon Student.

**Software as Service for All Previous Retail Generations**    G4 platforms' cloud services models provided complete or partial software solutions for mom-and-pop and retail chains of all sizes, including enterprise resource planning software. "Retail-as-a-service" software could digitally power a store's point-of-sale, store labor management, inventory control, ordering, and logistics.

**Online Merges with Offline (OMO)**    G4 platforms sought to extend this to make in-person shopping and online shopping one seamless experience, online to offline and the reverse. Amazon, Walmart, Alibaba, and other G4 leaders each built out their own captive and digitized distribution, physical stores, and last-mile networks. By 2019, shoppers could check into a store digitally, browse products in-store, learn more about them using a smartphone,[h] add the products to a digital cart, and then complete the purchase whenever they chose for delivery in less than one hour. This integration was perhaps the most crucial competitive advantage in the early stages of G4; the consumer benefits were significant.

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[g] Last-mile delivery referred to final delivery of an item to a purchaser, usually at his or her home.

[h] Some retailers labeled products with a two-dimensional image, often called a QR code, that a shopper could scan with her smartphone to learn more about the product.

## Leadership Challenges in Entering Generation Four

While leaders still grappled with the implications of G2 and G3, they also saw the signals in 2019 that each had to navigate the challenges of G4. These challenges included:

**Capital Deployment**    G4 made capital deployment decisions even more complex. Fast-growing competitors often had much lower cost of capital and a greater willingness to make calculated losses in exchange for share.

Stores, distribution, and inventory made up the majority of G2 and G3 retailer assets. All were hard to pivot. As G2 scale-based advantages diminished and G4 OMO models became more visible, G2 and G3 retailers faced difficult choices with less certain returns. How could they finance the required digital transformation as well as refresh their retail store and distribution networks?

**Purpose-Built Retail Stores**    Many retailers built stores for achieving G4 goals. Leaders decided to use stores as distribution, experience, and marketing nodes first and as merchandising centers second. They purpose-built new stores for these goals, or they retrofitted old stores. Retailers had to set up stores to collect shopper data to support modernized loyalty and customer relationship management (CRM) capabilities to track customer behaviors and communicate relevant offers. Some offered other digital tools to customers, such as apps to allow customers to order online to pick-up in-store or to scan items in-store to pay without waiting in line for an open register. Retailers had to decide how to invest in shopper experience, how to balance that experience with the store's role as a distribution node, and how that balance would shift over time. When a retailer changed the purpose and design of the physical store, the retailer also had to invest in new skills for store associates and a corresponding logistics network. (See **Appendix B** on the evolution of the retail store.**)**

**Cooperation vs. Competition**    As G4 platforms began to re-sell their infrastructure, other retailers had to choose to what extent they would compete with the growing G4 platforms and to what extent they would cooperate by licensing the platform infrastructure. To reach certain consumer markets, many major retailers and brands decided to use G4 platforms for payments, delivery services, and access to their marketplace. By 2019, a few major retailers licensed G4 platform capabilities even further. For example, Office Depot (a U.S. office supplies retailer) and El Corte Inglés (Spain's largest department store) agreed to engage with Alibaba on cross-border product sales, data sharing and analytics, and, eventually, on to its enterprise system software capabilities. For large G2 and G3 retailers, the decision of how much to compete or cooperate with major platforms was in many ways the most critical. Many sub-scale retailers did not have a choice and had to cooperate, because they did not have the scale to "jump onto the G4 curve."

**Data Acquisition and Analysis**    Some industry participants believed that data was the critical resource of the digital economy, "the new oil," and a key source of competitive advantage. A common question for leaders in 2019 was how best to leverage data to create a competitive advantage. Gaining competitive advantage in data required capabilities in data management, analytics, activation, and automation. Of these capabilities, data management and activation were the most complex. Data management was complex, because competitors and suppliers to the platforms also sought access to the same data to gain an edge. Management teams looked for data that competitors lacked. Activation was complex, because each player competed on speed to insight from data and speed to put those insights into practice.

**Data Governance**    With the increases in data and algorithms came new challenges around data governance. Computers helped with more decisions, sometimes making those decisions in the

background and out of sight from humans entirely. Leaders had to learn how to ask the new questions about data sources, integrity, the algorithms in use, and the quality of the decisions and actions taken as a result. Moreover, abuse of customer trust with their data could lead to customer defection or a regulatory response. Leaders had to ask the right questions to prevent data handling mistakes.

**The Data Science Organization**    Companies hiring data scientists had to figure out the optimal way to organize these employees and to integrate their work into the wider company. Leading companies saw the main challenges in managing data science as: identifying high value problems to work on, acquiring the right data and talent to build an analytical tool that solves the problem, and activating the wider company to use the solution. These challenges played out over several dimensions:

*Reporting Structure*    Data science teams needed to be accountable to business units so that their work aligned with the highest value problems in the business. However, data scientists often found themselves isolated when working directly with business units. They might feel cut off from learning and bonding with other data scientists. Or, managers who lacked data-related training might ignore them. Many organizations found a matrix structure helpful in aligning data science teams with business unit problems.

*Useful Data*    Data science teams needed useful data to solve problems. Often data scientists found breakthroughs by combining granular data sets from disparate sources into new results.

*Tool Adoption*    High-quality algorithm development was not useful to workers that failed to integrate them into their workflows. Data scientists found tool adoption to be highest when the algorithms achieved quick wins and had simple-to-use interfaces. As an example, one data science manager pointed out that Google Maps used highly advanced algorithmic software, yet the complexity was hidden from the user making it easy to use. For many workers, algorithms increasingly ran in the background, like electricity or Wi-Fi.

*Model Lifecycle Management*    Data scientists developed models that began to depreciate soon after completion. Over time, input data became stale, assumptions would go out-of-date, and the business context would change. Companies that wanted trustworthy algorithmic models had to plan to manage the lifecycle of a model from birth to retirement.

*Machine-to-Machine-to-Consumer (M2M2C)*    Companies increasingly communicated with each other via computer systems to make decisions, rather than person-to-person. For example, the Amazon algorithm attempted to serve shoppers, but Amazon's suppliers had to forecast the Amazon algorithm to manage their production capacity. Leaders of both retailers and brands increasingly integrated their data and algorithms together to coordinate production. To do so, they had to decide which information they could share to preserve competitive advantage, how to predict information their partners were unwilling to share, and how best to govern joint algorithm development and model lifecycle management.

**Redefining Leaders and the Workforce**    As the nature of commerce changed, so too did the workforce. Leaders took on the mantle of persistent transformation. Many companies automated repetitive tasks and augmented functional specialists with artificial intelligence tools, especially in product supply and commercial operations. Major tasks began to require fewer people. Digital and related G4 skills and literacy became the top barrier to transformation.

Re-skilling the organization was a major focus. Changes went beyond the rank-and-file employees. Mid-level and upper-level managers had to advance, often at a faster pace to adapt to the new methods

of competition, lead innovation and pilots, and make faster pivots. (See **Appendix C** on the evolution of the retail workforce.**)**

## Conclusions

As the consumer industry shifted in 2019, the profound distinctions between these inter-generational retail models amplified. Retailers, brands, and distributors were not in charge. The consumers and platforms were in control. The leadership challenge of the day involved knowing how each party would create and capture value in the constantly transforming value chain. Advisors argued that executives had to reskill themselves to avoid being left behind and to successfully transform their business models, economic structures, capital allocation, and human resources. (See **Exhibits 8 and 9** for changing statistics for retail in U.S. economy.)

In setting company strategy, leaders had to understand both how the next generation of retail would be different from the generation prior and how it would affect their sources of competitive advantage. How would the shopper journey from browsing, to purchase, to re-purchase change? How would companies redesign their products, marketing, and operations to serve and shape that journey? How would this journey be different between consumer and business customers, and what would that mean for retailers? Would companies create and capture value in the same ways? How would their financial models need to change to maintain profitability, while also undergoing major investments? Should they build platform technology in-house or buy it from larger platforms? How would a company be profitable in a G4 world?

In setting workforce strategy, leaders faced even more questions. Which new roles should they attempt to hire? How could they attract, train, and retain that talent? As they invested capital in new technology, what activities should they seek to automate and augment? As leaders crafted company-wide communications, what skills and values would they seek to socialize into the culture of their firms? How could they organize and incentivize data teams to take advantage of the increasingly valuable data?

The retail industry had gone through shifts in the past and many in 2019 expected the pace of change to increase in the coming years. The G4 world was upon the industry. How would leaders respond?

**Exhibit 1**    E-Commerce Penetration of Overall Retail Sales, Select Countries, 2017
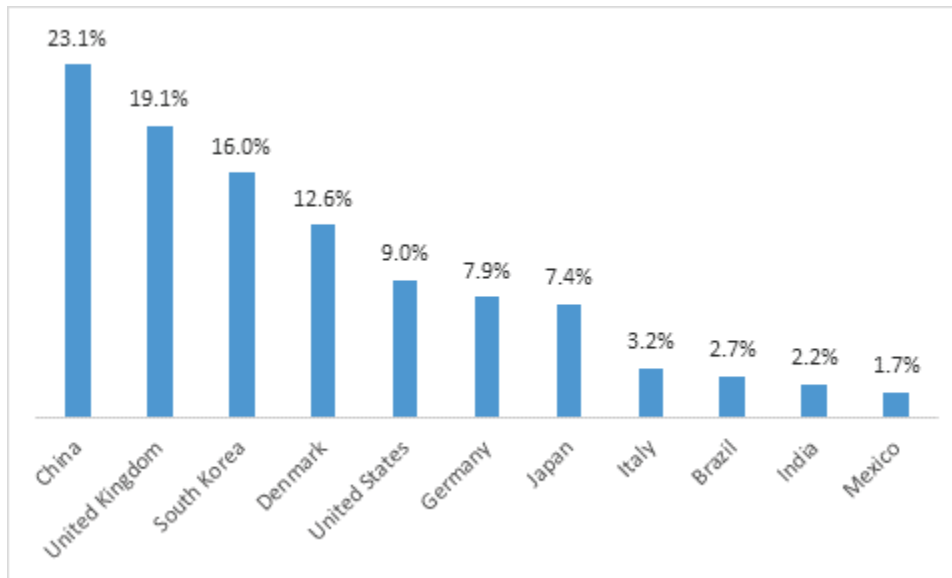


Source:    Statista, "E-commerce sales as percentage of total retail sales in selected countries in 2017," https://www.statista.com/statistics/255083/online-sales-as-share-of-total-retail-sales-in-selected-countries/, accessed March 2019.

**Exhibit 2**    Retail Generations One, Two, Three, and Four
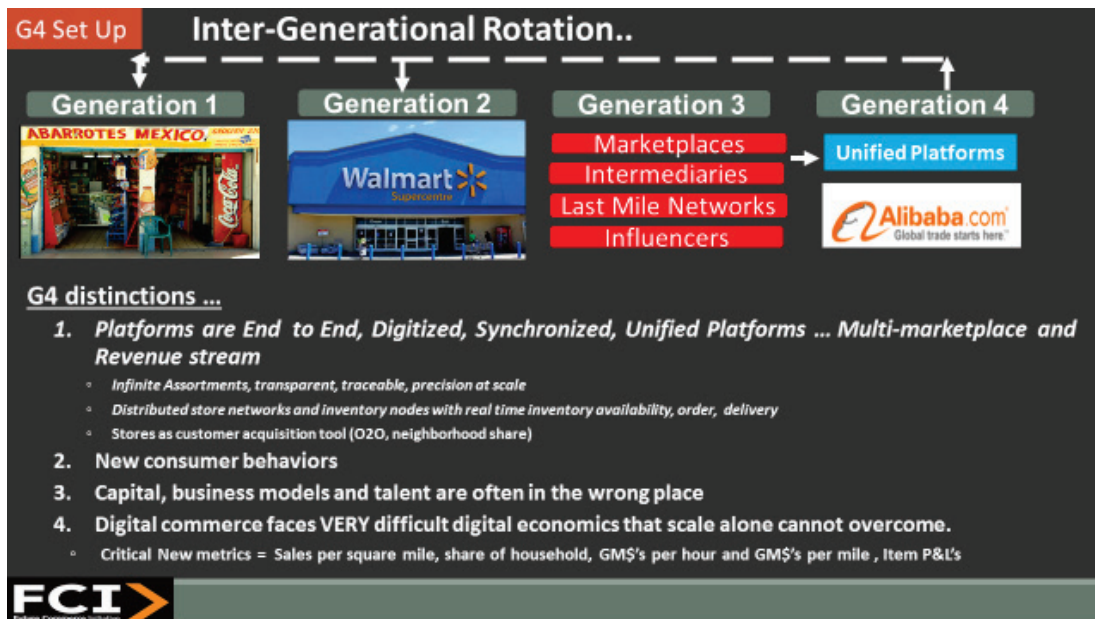


Source:    Casewriter Daniel O'Connor.

**Exhibit 3**    U.S. E-Commerce Penetration by Consumer Category, 2007-2017
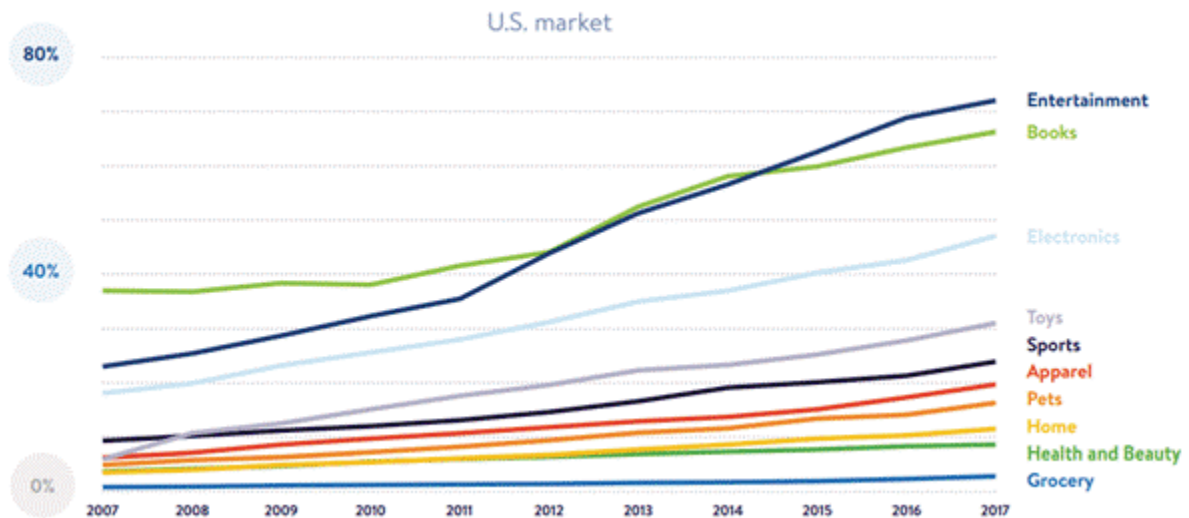


Source:    Walmart, "2017 Investment Community Meeting," Presentation by Doug McMillon CEO, October 10, 2017, https://news.walmart.com/events/2017-investment-community-meeting, accessed February 2019.

**Exhibit 4**    First-Party and Third-Party E-Commerce Sales, 2013-2017, $ Trillions
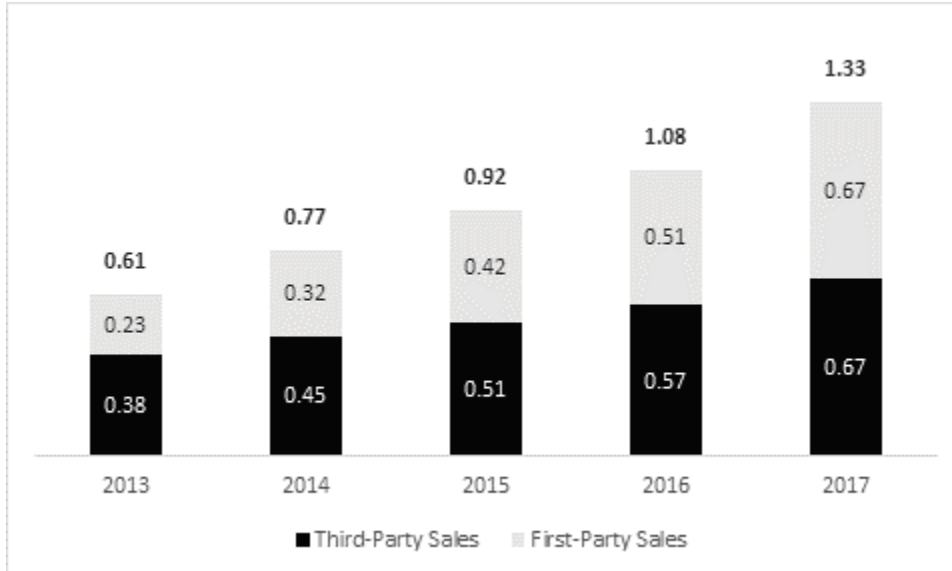


Source:    Casewriter based on analysis provided by Ascential Edge, April 2019.

**Exhibit 5**    Example Item Economics, Amazon.com vs. Walmart, 2017

| Cost Type | Amazon.com | Walmart Stores | Difference |
|---|---|---|---|
| *Average Selling Price* | *$24.30* | *$26.00* | *$1.80* |
| *Cost per Unit* | *($22.90)* | *($21.10)* | *$1.80* |
| **Gross Profit per Unit** | **$1.40** | **$5.00** | **$3.60** |
| | | | |
| *Fulfillment Center/Distribution Center* | *($1.40)* | *($0.20)* | *$1.20* |
| *Outbound Shipping (to Customer)* | *($4.00)* | *--* | *$4.00* |
| *Inbound Freight (and Walmart Lanes)* | *--* | *$0.10* | *$0.10* |
| *Store costs & labor* | *--* | *($2.10)* | *($2.10)* |
| *Discount Programs* | *($1.50)* | *--* | *$1.50* |
| *Marketing* | *($0.20)* | *($0.50)* | *($0.20)* |
| *Damage/Liquidation/Shrink* | *($0.30)* | *($0.10)* | *$0.30* |
| **Total Costs** | **($7.40)** | **($2.80)** | **$4.60** |
| | | | |
| *Accrual/Slotting etc.* | *$1.40* | *--* | *($1.40)* |
| *Email and Circular* | *$0.50* | *$0.20* | *($0.30)* |
| *Display Ads* | *$0.20* | *--* | *($0.20)* |
| *Vendor Allowance* | *$0.20* | *$0.10* | *($0.10)* |
| *Quick Pay Discounts* | *$0.50* | *$0.40* | *--* |
| **Total Manufacturer Offsets** | **$2.80** | **$0.80** | **($2.00)** |

Source:    Spencer Millerberg, One-Click-Retail, Presentation to CPG Manufacturer, 2017.

Note:      Rounded to nearest $0.10.

**Exhibit 6**     Platforms vs. Initial E-Commerce



Source:     Casewriter Daniel O'Connor.

**Exhibit 7**   Alibaba Group of Businesses, 2018



Source:   Alibaba Group Holding Limited, 2019 Annual 20-F Report (Hong Kong: Alibaba Group Holding Limited, 2019), p. 63, https://otp.investis.com/clients/us/alibaba/SEC/sec-show.aspx?FilingId=13476929&Cik=0001577552&Type=PDF&hasPdf=1, accessed June 2019.

**Exhibit 8**    Employment, Hours, and Earnings from the Current Employment Statistics survey (National)
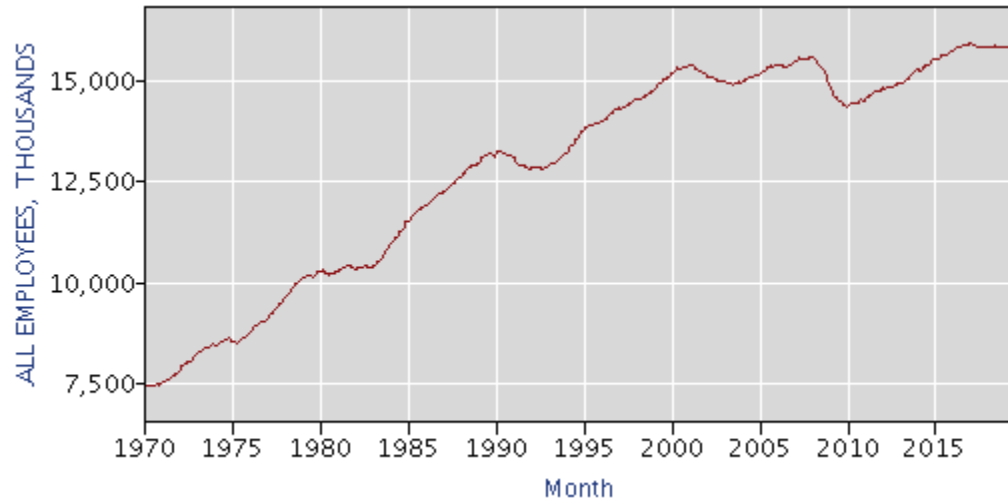


Source:    Bureau of Labor Statistics, https://data.bls.gov/pdq/SurveyOutputServlet, accessed October 8, 2019.

**Exhibit 9**    Percent of Retail Jobs in U.S. Counties, 2016
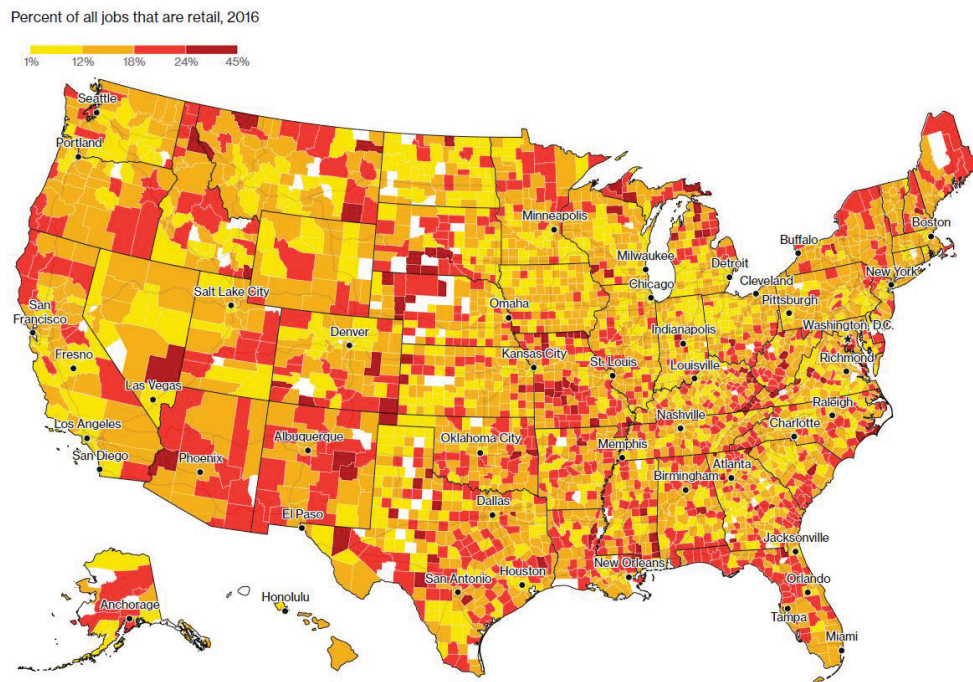


Source:    Data from the Bureau of Labor Statistics, from Matt Townshend, Jenny Surane, Emma Orr, and Christopher Cannon, "America's 'Retail Apocalypse' Is Really Just Beginning," *Bloomberg*, November 8, 2017, www.bloomberg.com/graphics/2017-retail-debt, accessed July 2018.
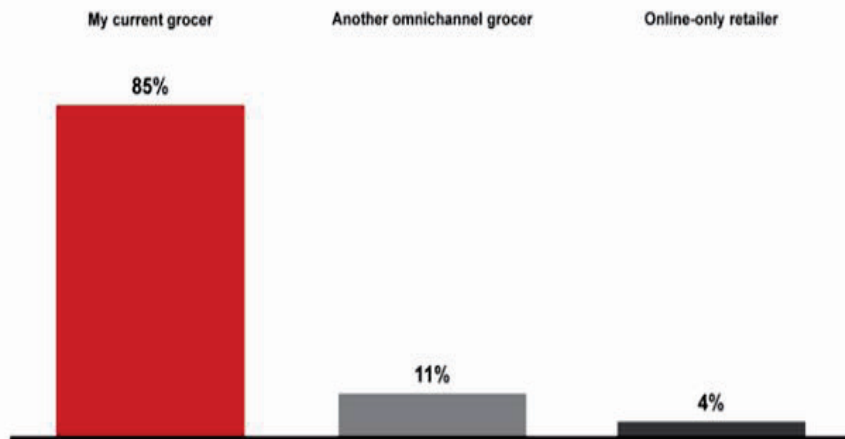
**Exhibit 10**    Three Distinct Digital Models
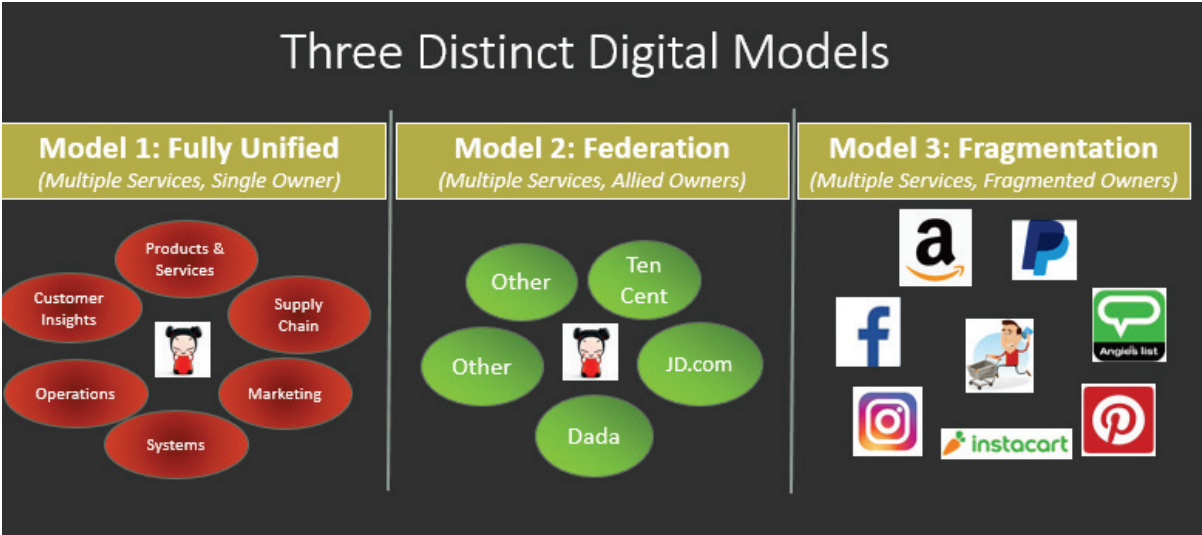


Source:    Casewriter Daniel O'Connor.

**Exhibit 11**  Shopper Affinity for Local Stores

If you were to buy groceries online, which retailer would you be most likely to choose?



My current grocer — 85%

Another omnichannel grocer — 11%

Online-only retailer — 4%

Source: Stephen Caine and Michelle Paratore, "Omnichannel Grocery Is Open for Business—and Ready to Grow," *Bain & Company*, February 5, 2019, https://www.bain.com/insights/omnichannel-grocery-is-open-for-business-and-ready-to-grow/, accessed April 2019.

Note: Reflects responses of consumers who have not purchased groceries online in the prior 12 months, but would consider doing so in future.

**Exhibit 12**  Online Grocery Shopper Retention

Percentage of online grocery shoppers in the prior 12 months



Still shopping with first-ever online retailer — 75%
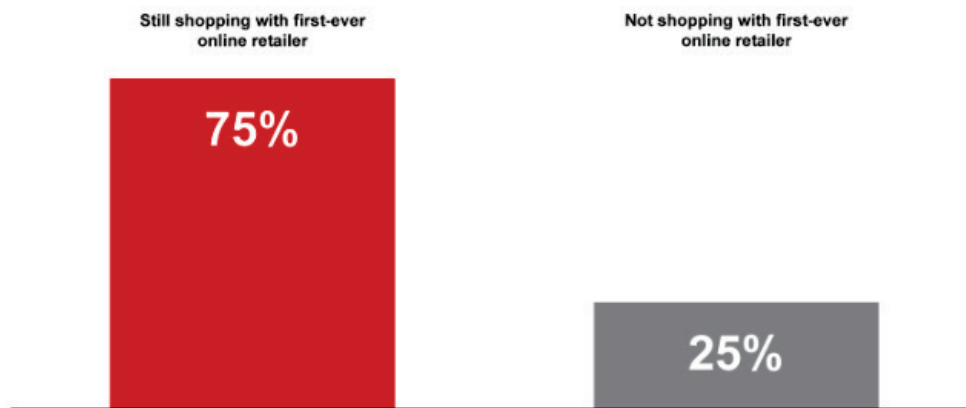
Not shopping with first-ever online retailer — 25%

Source: Stephen Caine and Michelle Paratore, "Omnichannel Grocery Is Open for Business—and Ready to Grow," *Bain & Company*, February 5, 2019, https://www.bain.com/insights/omnichannel-grocery-is-open-for-business-and-ready-to-grow/, accessed April 2019.

## Appendix A: Three Distinct Digital Models for Unification

In 2019, major retailers were in different stages of the transition to G4 models, with differences especially pronounced by geography. (See related product: "Online Merged with Offline: A Technical Note on the New China Standard" for 2019 G4 commerce in China.)[i]

The approaches differed in the scope of capabilities a company obtained for its customers and whether it obtained those capabilities through partnerships or in-house competencies. (See **Exhibit 10** for an illustration of the three basic models.

By 2018, Alibaba Group ran a fully-integrated fourth generation retail platform. The Group operated several online retail marketplaces (TaoBao, Tmall, etc.), physical stores (Hema), consumer information and entertainment (Youku, UCWeb, etc.), logistics (Cainiao, Ele.me), a suite of cloud-based technology tools (Alibaba Cloud), and its close affiliate owned a popular payment system (AliPay). The combination of directly integrated Alibaba services allowed the company to capture unified data about its customers across multiple touchpoints, maintain real-time data on products across its end-to-end supply chain, and monetize its platform through a suite of services (marketing, analytics, software, delivery, etc.) rather than through merchandise margin.

Other companies in China developed federations of business partnerships to create a similar suite of offerings. In particular, JD.com's e-commerce unit cooperated with Tencent's social WeChat application, Walmart's China-based physical stores, and Dada's last-mile delivery network. The federation of companies integrated services with each other, shared data about shoppers, and referred customers to each other. In this way, they could collectively gain synergies similar to a unified company.

At the same time, no company or federation of companies offered such tightly integrated service in the U.S. The largest e-commerce company, Amazon, had only some characteristics of a retail platform. Amazon did offer a suite of services (marketing, cloud hardware, warehousing) to business partners so that it could profit through means other than merchandise margin. However, Amazon had limited control on last-mile delivery, limited online sales of high-velocity goods (e.g., grocery), and only had fragmented data on its shoppers. It did not have visibility into the majority of shopper spending or entertainment behavior. It did strike some data-sharing partnerships to get access to this data, but the depth of these partnerships was limited by regulation, willingness of companies to work together, and capability of partners to gather rich data themselves.

Each of these three models differed in the shopper experience. A unified platform could provide a low-friction shopping experience for extensive personalization. For a federation, such as JD.com and its partners, there were more shopper hand-offs and more effort required to personalize shopping. For more traditional e-commerce, such as in the U.S., ability for personalization was even narrower.

Source:    Casewriters.

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[i] William Kerr, Daniel O'Connor, and Nathaniel Schwalb, "Online Merged with Offline: A Technical Note on the New China Standard," HBS No. 820-014 (Boston: Harvard Business School Publishing, forthcoming).

## Appendix B: The Evolution of the Retail Store

G1 mom-and-pop stores generally served very nearby populations. In urban or suburban neighborhoods, an independent store's entire customer base might live within three kilometers of the store. The stores were often small, ranging from a few hundred to a few thousand square feet. Shoppers would often visit multiple stores to complete their errands and find a wide variety of products. To supply the store, wholesale distributors would bring many different types of products in delivery trucks that would stop at multiple stores.

G2 big box stores served much broader populations. In urban or suburban neighborhoods, a big box store's customer base might live up to 25 miles from the store location. In 2019, the average Walmart Supercenter was about 175,000 square feet.[10] At big box stores, like Walmart Supercenters or Target, shoppers could find a wide variety of products and often complete multiple types of errands in a single trip. To supply the large stores, retailers would set up large distribution centers (DCs). DCs would receive whole truckloads of product from suppliers to replenish supplies at 50 to 150 regional stores, sending full pallets of high-demand products to the stores on a regular basis.

G3 e-commerce retailers needed different supply chains. Traditional DCs, designed to ship pallets of goods to stores, could not accommodate the delivery of individual items, called "eaches," to individual homes. To facilitate home delivery, e-commerce companies developed so-called fulfillment centers (FCs), where workers and robots picked eaches and packed them together into boxes for shipment.

G3 e-commerce affected physical stores by taking share and driving store closures, but this did not necessarily change store design or their functions for shoppers. Only as G4 emerged and major retailers transitioned into platforms, did companies begin to change the functions and strategies of physical stores themselves. G4 stores were purpose-built for different logistics, customer experience, and company strategy. (See related product: "Online Merged with Offline: A Technical Note on the New China Standard" for emergence of G4 stores in China.)[j]

At a logistics level, purpose-built G4 for stores facilitated delivery. They often had specific counters or lockers for delivery drivers to pick up orders. They had aisles, store sections, or nearby dark stores designed for delivery item-picking, rather than just for shopper browsing. Their locations were closer to urban centers, which in turn limited their total square footage.

At a customer experience level, online merged into the offline experience. Digital payments became more pervasive, allowing customers to pay via smart phone. In some stores, customers could scan products or demonstration items to learn more about them on their smartphones or collect digital discounts. Some retailers added self-serve checkout.

On a strategic level, retail companies expected stores to serve a different function. Physical retail stores could serve as acquisition tools to bring shoppers aboard larger retail platforms. Shoppers generally were interested in working with their local stores, even when shopping online. (See **Exhibit 11** for customers' local store affinity.) Moreover, acquiring these customers was valuable, as customers that started with a particular retailer tended to stick with it. (See **Exhibit 12** for retention statistics.) Retailers expected that they would primarily devote floor space to selling categories that shoppers liked

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[j] William Kerr, Daniel O'Connor, and Nathaniel Schwalb, "Online Merged with Offline: A Technical Note on the New China Standard," HBS No. 820-014 (Boston: Harvard Business School Publishing, forthcoming).

to buy in-person, such as fresh food, while maintaining a digital relationship with the shopper to sell categories that shoppers often liked to buy from home, such as electronics.

One example of this trend was Hema, an initiative of China's Alibaba. Hema stores co-located a set of nicely displayed aisles of products for in-store shopping with an adjacent dark store. Customers that lived within three kilometers of the Hema store could order products on their smart phones and receive delivery within 30 minutes. The in-store shopping aisles displayed very limited packaged product brands. The assumption was that if shoppers needed something particular, they would order online. Shopping for packaged goods in-store would likely just be for convenience, so brand breadth of selection would not matter. In contrast to the packaged goods strategy, the Hema stores had plentiful choices for fresh foods and even multiple in-store restaurants. Many customers enjoyed shopping in-person for fresh food. By offering multiple methods to sell fresh food, such as delivery, in-person grocery, and restaurants, Hema could maintain high turnover. Shoppers could scan products for information and pay with their smart phones, providing the Alibaba platform with real-time data on shopper behavior. Professional shoppers picked customer orders for delivery from both the customer-facing section of the store and the dark store. To supply the Hema stores, Alibaba used both DCs (for mass-volume products) and FCs (to facilitate eaches delivery of a customer's other Alibaba orders).

Source:    Casewriters.

## Appendix C: The Evolution of the Retail Workforce

The structure of the retail workforce evolved with each retail generation. These changes included the types of jobs available, the location of those jobs, their required skills, and their compensation. The U.S. retail sector served as an illustrative example of these global changes. (The Chinese retail sector also served as an illustrative example. In 2019, China was arguably the most digitized retail sector. See related product: "Online Merged with Offline: A Technical Note on the New China Standard" for 2019 G4 commerce in China.)[k]

In 2018, brick-and-mortar store labor was a major feature of the overall U.S. labor market, accounting for about 15 million jobs. About half of these jobs were made of just four types: retail salespeople (4.1 million people), cashiers (2.9 million people), stock clerks (1.4 million people), and first line supervisors (1 million people). These many brick-and-mortar store jobs were subject to change and displacement by G3 and G4 trends.

The shift to online retail displaced some brick-and-mortar jobs. In 2018, G3 digital retail firms employed about 600,000 people in the U.S. Common occupations in this field included customer service representatives, computer programmers, web designers, data analysts, delivery drivers, and warehouse employees. Amazon alone employed more than 90,000 warehouse workers in the U.S.

The e-commerce workforce was much more concentrated geographically than the brick-and-mortar retail workforce. While just about every city and town in America had a range of brick-and-mortar retailers, in 2018, e-commerce employment was concentrated in big city offices and strategically located warehouses, which were situated close enough to urban centers to make deliveries but far enough away to take advantage of lower priced land and labor.

Average pay differed between brick-and-mortar and e-commerce workers. Average pay for nonsupervisory retail workers was about $15/hour in 2018. Cashiers and stock clerks averaged just above minimum wage, $7.25/hour at the federal level in 2018, while customer service representatives and salespeople averaged closer to $15; first line supervisors averaged about $20/hour. Average wages for e-commerce workers were around $25/hour in 2018, although for more technical workers, wages could be much higher and for warehouse workers, much lower.

G4 trends threatened to change staffing patterns and skills within brick-and-mortar stores themselves. In new retail stores, digital payments made cashiers obsolete and the smaller selection of shelved items reduced the need for workers to manage inventory displays. Instead, many additional laborers worked in item picking and driving roles that facilitated home delivery.

As retailer roles changed, the stability and benefits of store jobs threatened to change as well. In the U.S., many G2 physical store employees earned a salary or an hourly wage, often with benefits. Occasionally, they were members of unions. In contrast, delivery and picking workers often worked as part of the "gig economy"—selecting jobs at irregular intervals from a digital platform. The gig economy gave workers more flexibility to choose their own hours but provided no guarantee of hours available. Moreover, gig economy workers generally did not receive employee benefits and enjoyed fewer labor law protections.

G4 retail software also changed how independent storeowners and big box store managers organized their work. In a typical independent store, owners did much of the inventory, cash

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[k] William Kerr, Daniel O'Connor, and Nathaniel Schwalb, "Online Merged with Offline: A Technical Note on the New China Standard," HBS No. 820-014 (Boston: Harvard Business School Publishing, forthcoming).

management, and staffing work themselves. Store managers often had similar responsibilities at big box stores. Retail software increasingly automated these tasks, freeing up store supervisor and storeowner capacity to work on other activities, such as managing customer service.

On the brand side, the rise of G4 led to staffing changes. By 2019, retailer decision-makers increasingly relied on algorithms to augment or automate their decisions-making processes—such as setting stocking levels. Therefore, brands in G4 expected to retail decision-makers to view them through the lens of software, instead of through the influence of a human relationship with a salesperson. Brands increasingly hired data scientists and performance marketers to drive demand.

These data scientists and performance marketers often had to develop skills to work with particular platforms. As platforms consolidated, a dominant platform might run software to power its own operations, several regional grocery chains, thousands of mom-and-pop shops, and a host of other retailers. In such a world, suppliers might sell into many retailers, but all would be using the same underlying platform technology, with the same algorithms, user experience, and similar negotiating terms. Just as brands had built workforces tailored to supply major G2 retailers like Target, they again reorganized their workforce structure and skills to best work with major new platforms, like Alibaba.

Source:   Casewriter Daniel O'Connor general knowledge; U.S. Bureau of Labor Statistics, "Industries at a Glance: Retail Trade," https://www.bls.gov/iag/tgs/iag44-45.htm, accessed August 2018; U.S. Bureau of Labor Statistics, "Industries at a Glance: Nonstore Retailers," https://www.bls.gov/iag/tgs/iag454.htm, accessed August 2018; Nick Wingfield, "Amazon Proves Infertile Soil for Unions, So Far," *New York Times*, May 16, 2016, https://www.nytimes.com/2016/05/17/technology/amazon-proves-infertile-soil-for-unions-so-far.html, accessed August 2018.

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