

2022 EMERGING TECHNOLOGY TRENDS

MARKET AND LEGAL INSIGHTS FOR INNOVATORS



RETAIL & E-COMMERCE

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Within retail technology, e-commerce platforms rely on an ecosystem of software tools that allow users to build online shops, digitize physical stores, make sales and process payments, and fulfill orders via self-service.

SECTOR OVERVIEW

What Is Retail and E-Commerce Technology?

Retail technology is a broad category comprising any technology that supports or enables the selling of consumer products, including technologies that assist merchandising, support shopper marketing, modernize operations and supply chain management, facilitate order fulfillment (in stores, online, and across other retail channels), and enable new retail formats and experiences. Within retail technology, e-commerce platforms rely on an ecosystem of software tools that allow users to build online shops, digitize physical stores, make sales and process payments, and fulfill orders via self-service.

Associated Sectors

- Retail
- Restaurant and Hospitality
- Financial Services

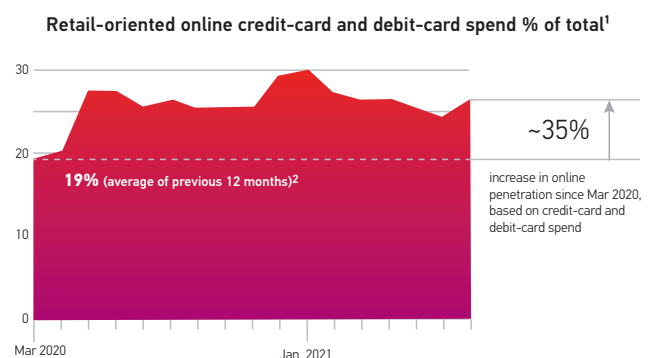
In addition to the retail sector overall, these technologies are closely associated with industry sectors that have moved more aggressively into direct sales and platform business models, such as the restaurant and hospitality sector and mobility. Industries that are deploying more remote and virtual services, like banks and other financial services, are tied to e-commerce and related technologies.

Why Is It Important?

Retailers globally are undertaking renewed efforts to reimagine the traditional retail experience, capitalizing on pent-up demand generated by the COVID-19 pandemic and a broad

expansion of digital shopping. The pandemic accelerated the shift to e-commerce by an estimated five to ten years. In fact, the penetration of e-commerce reached a peak of 33% of total retail sales in July 2020, overtaking earlier expectations that it would reach 24% by 2024. Online penetration has remained about 35% above pre-pandemic levels as e-commerce has exhibited more than 40% growth over the one-year period preceding August 2021.

ONLINE PENETRATION INCREASED WITH THE ONSET OF COVID-19 AND HAS REMAINED ABOUT 35% ABOVE PRE-COVID-19 LEVELS



¹Includes the following retailer categories: Amazon, apparel, club stores, cosmetic, discount stores, drugstores, grocery stores, home stores, mass stores, pet shops, restaurants, software and electronics.

²Average monthly online penetration from Mar 2019–Feb 2020.

Source: Affinity Solutions credit-card and debit-card spend data for Feb 2019–Jun 2021; Facteus debit-card spend data for Feb 2019–Jun 2021; Stackline Amazon spend data for Feb 2019–Jun 2021

Growth has slowed since the start of the pandemic, when it jumped 33.6% in 2020 as consumers shopped online during the lockdowns. Nevertheless, consumers in the United States

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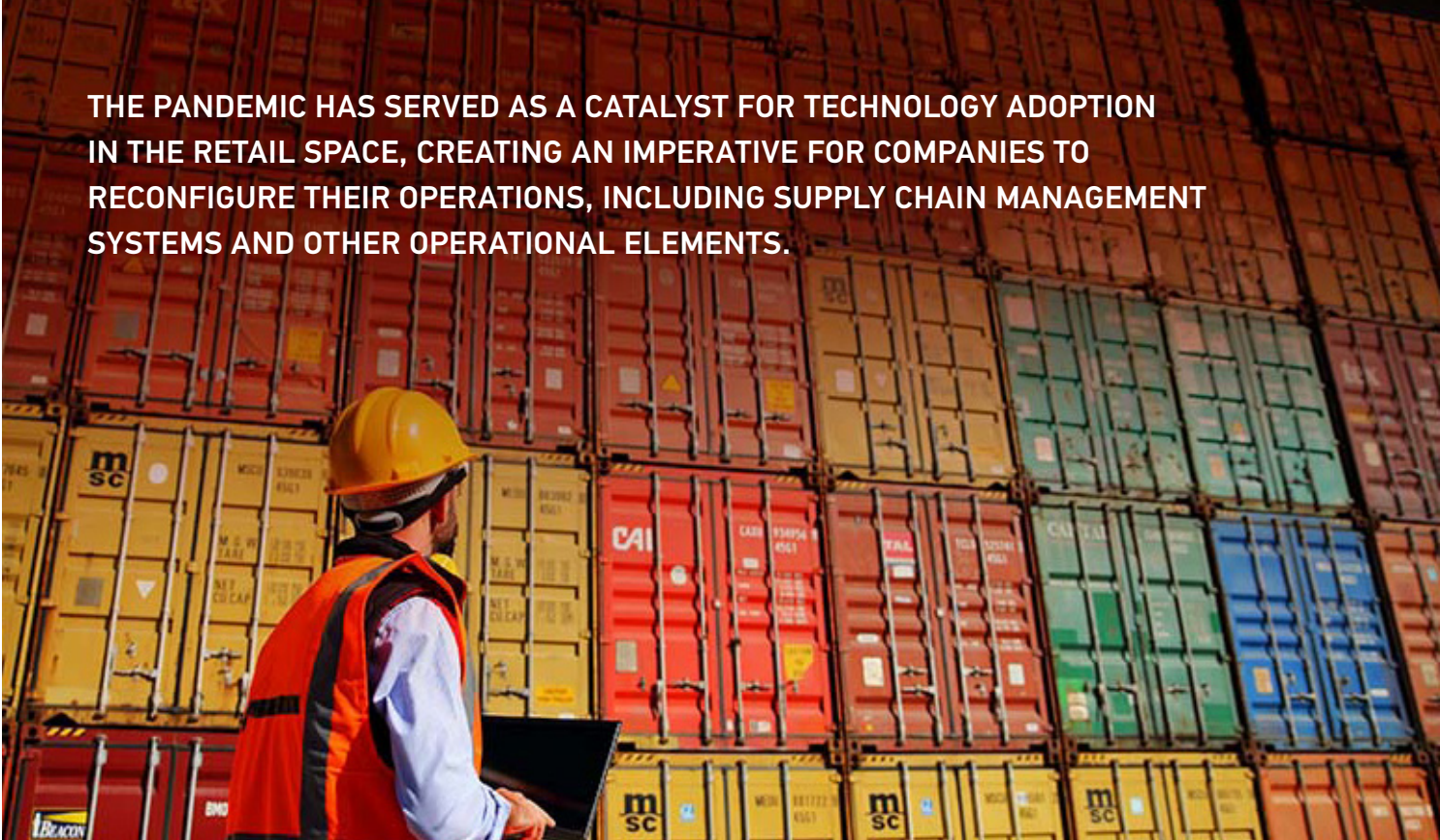
SECTOR OVERVIEW (CONT'D)

are on track to spend a record \$1 trillion online in 2022. Amid this growth, leading e-commerce companies—Amazon, Alibaba, and Wayfair among them—have reported double-digit revenue growth.

The Impact of COVID-19

The physical retail environment is changing, as retailers close stores. Investment firm UBS estimates that upwards of 80,000 retail locations will close in the next five years, which is equal to about 9% of the existing stores in the United States. Although retailers were already rethinking their store footprints due to the rise of e-commerce, the COVID-19 pandemic is forcing them to reconsider store strategies as

more consumers are pushed online, resulting in reduced sales at brick-and-mortar locations. UBS estimates that for every 1% increase in e-commerce penetration, 8,000 stores will need to close. Department stores, already struggling before the pandemic, have been particularly hard hit—some to the point of bankruptcy. Going forward, expectations are that brands will move away from wholesale business and shift toward a direct-to-consumer approach and a model with department stores under which they control their own space and inventory. Retailers may consider alternatives for their physical sites, such as using them as immersive spaces for consumers to experience brands or as centers to provide local support for goods and services.



THE PANDEMIC HAS SERVED AS A CATALYST FOR TECHNOLOGY ADOPTION IN THE RETAIL SPACE, CREATING AN IMPERATIVE FOR COMPANIES TO RECONFIGURE THEIR OPERATIONS, INCLUDING SUPPLY CHAIN MANAGEMENT SYSTEMS AND OTHER OPERATIONAL ELEMENTS.

RETAIL & E-COMMERCE

SECTOR OVERVIEW (CONT'D)

The pandemic has served as a catalyst for technology adoption in the retail space, creating an imperative for companies to reconfigure their operations, including supply chain management systems and other operational elements, as well as sales channels. Retailers were forced to quickly ramp up the transition to e-commerce and launch new convenience services, such as buy online, pick up in-store (BOPIS), curbside pickup, and delivery. As a result, the digitization of customer and supply chain interactions has accelerated by an estimated three to four years. E-commerce shifted from “perpetual top priority on every retailer’s three-year plan to a desperately needed lifeline,” prompting an estimated \$10 billion in e-commerce investments, acquisitions, and partnerships from May to July 2020. COVID-19 also hastened the adoption of in-store technology, particularly noncash payment options.

With the accelerated shift to digital, the gap widened between industry leaders and laggards. Companies with tech-forward operations and strong omnichannel presences, wherein consumers switch regularly between their online and offline channels, experienced strong tailwinds. Those with more robust digital capabilities before the pandemic, including strong platforms and data capabilities as well as the systems needed to support new convenience options, have generally fared better.

As consumers purchase goods, a larger number of websites, online marketplaces, and retailers are increasingly benefiting from platform economics—generating more returns by leveraging the scale and expandability of platform business models, while reorienting to capture a “share of life” outside their traditional products and services. Companies such as Shopify and Square that serve these e-commerce ecosystems

are benefiting in turn. Mega platforms including Walmart and Amazon are shifting the landscape by expanding their offerings—and they are expected to continue to outspend competitors. However, niche platforms may also expand by offering unique services or building strong consumer loyalty. With e-commerce business growing, and new startups entering the space, competition in the space will increase.

Outlook

As recovery continues, expectations are that many of the consumer behaviors and business practices adopted during the pandemic will endure—20% to 30% of the pandemic-related digital shift is expected to be permanent. Digital acceleration is predicted to continue, prompting retailers to redirect funds from brick-and-mortar to technology to capitalize on the growing e-commerce market. Globally, e-commerce is projected to reach a record \$6.54 trillion by 2022 as demand for digital engagement continues. Since only 30% of retailers rate themselves as having mature digital capabilities, many are planning significant investments to upgrade their e-commerce, contactless capabilities, and store technology.

Future challenges will include institutionalizing the changes that were rapidly deployed during the pandemic, such as improvements to digital and omnichannel business models. Retail and e-commerce technologies will be central to those efforts as tech-driven consumers reshape the retail landscape. As they adapted to new digital realities, 71% of retail CFOs planned to increase IT investments in 2021, including 64% who planned to increase investments in e-commerce.

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ENABLING SCIENCE AND TECHNOLOGY

E-Commerce Enablement Services and Platforms

E-commerce software and platforms are central to efforts to increase digital maturity. Companies are investing in unique, stand-alone online sales platforms, mobile shopping platforms, and progressive web apps. They are either investing in end-to-end platforms or developing platforms in-house. Demand for e-commerce enablement solutions has grown markedly, propelling market gap growth, and is expected to continue to do so, with startups emerging that offer new enablement solutions, including “headless commerce” and payment and checkout solutions. Companies are using e-commerce platforms in different ways, including by using solutions focused on increasing page load speed, enabling single-click checkout, and opening new online channels such

as text messages, video chat, and augmented reality. Social commerce is also growing as social media platforms deploy shopping capabilities.

Headless e-commerce architecture, in particular, is attracting market interest. Headless e-commerce decouples front-end customer interfaces, such as storefronts, from back-end core commerce functions, such as payment processing. The technology supports the deployment of mediums such as voice, mobile apps, social media pages, and interactive kiosks, and the establishment of new online touchpoints, such as virtual pop-up stores. Expectations are that adoption of headless e-commerce and lean microservice tech stacks will accelerate in the near term, as e-commerce platform providers such as Shopify begin adding capabilities and startups make



COMPANIES ARE USING E-COMMERCE PLATFORMS IN DIFFERENT WAYS, INCLUDING BY USING SOLUTIONS FOCUSED ON INCREASING PAGE LOAD SPEED, ENABLING SINGLE-CLICK CHECKOUT, AND OPENING NEW ONLINE CHANNELS SUCH AS TEXT MESSAGES, VIDEO CHAT, AND AUGMENTED REALITY.

RETAIL & E-COMMERCE

ENABLING SCIENCE AND TECHNOLOGY (CONT'D)

headless commerce more accessible. In the near term, adoption will likely be limited for smaller businesses because of high setup costs and resource requirements.

Analytics and Artificial Intelligence

Retailers are using expanding troves of data to improve demand planning, forecasting, and inventory management processes; deploy more efficient and targeted advertising; and improve supply chain management. The disruption caused by the COVID-19 pandemic highlighted the weaknesses of current analytics capabilities, prompting increased attention and investment in analytics in 2021. As retailers upgrade their analytics platforms and data capabilities, they are increasingly adopting artificial intelligence (AI), which allows for more agility in adapting to changing markets. An estimated 35% of retailers expected to invest more in AI for their e-commerce operations in 2021. Half (53%) of retail business leaders surveyed by KPMG said their business had accelerated the pace of AI adoption because of the pandemic.

AI enables retailers to use real-time data to understand consumer habits and provide more personalization, create smarter digital asset management systems, facilitate new pricing strategies, and improve decision-making about physical store assets. Subcategories of AI where startups are emerging include AI-enabled product tagging, cognitive search solutions, and digital journey mapping. In the next two years, business leaders anticipate AI will have the greatest impact in customer intelligence (53%), inventory management (50%), and chatbots for customer service (49%).

Live Commerce

Live commerce links online livestream broadcasts with instant purchasing through e-commerce stores and audience participation through chat or reaction functions. Although it is a well-established sales channel in China, generating \$61 billion in 2020 and growing rapidly, the West is lagging in adoption. Expectations are, however, that live commerce may expand in

the United States, as pandemic conditions have encouraged consumers to try new engagement channels. Facebook and Instagram recently enabled businesses to extend their storefronts into the social media platforms. Livestream-generated sales were expected to double to \$120 billion globally in 2021. The key technology choice is which platform or marketplace to use for hosting livestreams and offering e-commerce and in-app commerce functionalities. Predictive analytics are used to track livestream performance, while machine learning develops automated real-time prompts to optimize streams.

App Commerce Technology

With the shift to mobile commerce, the in-app purchase market is expected to reach more than \$340 billion globally by 2027. In Q1 2021, consumers spent an estimated \$32 billion on apps across both iOS and Google play, representing a 40% increase over Q1 2020. Both app downloads and consumer spend are growing, with mobile consumers spending about \$9 billion more in Q1 2021 versus Q1 2020. One-click purchase and in-app purchasing capabilities are attractive for smaller retailers that may not have the capacity for their own digital storefronts, though transaction fees may be challenging for those with tighter margins. The pandemic accelerated retailers' uptake of mobile apps as consumers sought new shopping experiences.

Notably, social media and messaging apps are becoming direct-purchasing channels by rolling out in-app purchase features. In 2020, the number of U.S. consumers who purchased through social media expanded 25.2% to 80.1 million. In 2021, that number was expected to reach 90.4 million, propelling a 21.3% increase in social network ad spend to \$48.94 billion. Going forward, in-app purchasing capabilities may prompt more partnerships between brands and social media influencers and content creators as retailers look to attract younger consumers. Brands may also launch product lines and discounts exclusive to social media.

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ENABLING SCIENCE AND TECHNOLOGY (CONT'D)

Online-to-Offline and Hybrid Shopping Enablement Technology

Despite significant expansion in e-commerce, nearly 80% of retail revenue is currently generated offline (based on a 12-month rolling average)—and 74% of retail is expected to remain offline by 2024. Retailers are considering how they can maximize the value that stores generate to support margin expansion, while optimizing consumer touchpoints. They are exploring new ways to bring together their physical and digital operations and reconfiguring physical stores into fulfillment centers. Although only an estimated 10% of online orders are currently fulfilled by stores, that share is expected to double in the next 10 years as stores become fulfillment centers and are used as showrooms. This shift is also driving retailers to consider strategically relocating near dense population centers where they can more effectively provide last-mile delivery.

As part of that trend, online-to-offline (O-to-O) commerce, which converts online channel visits into offline sales, is gaining in importance. Unlike the omnichannel approach, O-to-O merges online and brick-and-mortar marketing to turn e-commerce visitors into physical shoppers. Companies do this by offering convenience services such as BOPIS, home delivery, and in-store returns for online purchases. Going forward, retailers are expected to experiment with retrofitting stores so consumers feel comfortable testing technologies such as contactless checkout, virtual fitting rooms or makeup applications, virtual appointments with sales associates and stylists, self-service kiosks and pickup lockers, and QR codes. Technologies including automation, AI, and robotics are also being used on the back end to support store logistics and maximize fulfillment capabilities.

ADVANCED ROBOTICS AND INTELLIGENT AUTOMATION

Blockchain Inventory Management

Blockchain and decentralized systems can help improve supply chain efficiency and inventory management, leading to lower costs and strengthened security, while improving transparency and traceability for consumers. On the back end, blockchain and smart contracts facilitate relations between retailers, brands, and manufacturers and simplify inventory management.

Last-Mile Delivery Technology

Retailers are investing in new delivery models, such as instant delivery, and scaling up last-mile and reverse logistics technology to remain competitive. Heightened demand for same-day fulfillment and convenience options such as curbside pickup and BOPIS have put pressure on existing distribution models. To meet shifting consumer needs and emerging challenges, while reducing costs and inefficiencies, retailers and logistics providers are experimenting with technology solutions to automate and optimize the last mile of delivery. Technologies being tried include AI, which is being leveraged to optimize delivery routes and reduce last-mile expenses; automated solutions such as micro-fulfillment centers that use automated order picking; warehouses that employ robotic picking; and self-driving, or autonomous, vehicles that deliver to consumers. While some companies are developing delivery and fulfillment centers in-house, others are looking to third parties that allow them to tap into existing infrastructure—not only logistics software but delivery networks as well.



LIVE COMMERCE LINKS ONLINE LIVESTREAM BROADCASTS WITH INSTANT PURCHASING THROUGH E-COMMERCE STORES AND AUDIENCE PARTICIPATION THROUGH CHAT OR REACTION FUNCTIONS.

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SECTOR AND INDUSTRY SIGNALS

Walmart to Sell E-Commerce Tech to Other Retailers

As part of its efforts to expand its profit pool beyond its core retail business, Walmart is selling its e-commerce technology to small and medium-sized retailers. The company is partnering with Adobe to provide a suite of cloud-based services, which will be offered through a subscription. Adobe's technology will be used to power e-commerce sites, while Walmart will provide the technology that powers the picking and packing of online purchases and the geofencing technologies that workers need to fulfill orders. Neither Adobe nor Walmart has disclosed the anticipated value of these new ventures.

SOCIAL MEDIA AND INFLUENCERS

Verizon Rolls Out 5G Immersive Retail Accelerator

Verizon, in partnership with U.K. digital technology innovation center Digital Catapult, launched a 5G immersive retail accelerator to help brands—including Burberry, Diageo, and L'Oréal UK and Ireland—explore 5G-enabled solutions. The accelerator will experiment with the in-store experience, out-of-store experience, digital product visualization, and virtual events, drawing on technologies such as immersive experience, AI, and machine learning. The accelerator will also be open to startups and scaleups working within the retail, immersive, or customer experience space.

Trigo, Google Cloud Team Up to Help Retailers Deploy AI in Checkout Process

Trigo and Google Cloud are working together to help retailers use AI to manage the checkout processes in their stores. Under a partnership agreement, Trigo will work with Google to “help retail businesses accelerate their digital transformations with AI-powered autonomous stores.” Few details were provided on the partnership, but Trigo has been expanding its efforts in the frictionless retail space with computer vision-based autonomous checkout technology. Trigo, which has attracted more than \$100 million in investments, recently

disclosed that it is working with retailer REWE to deploy grab-and-go checkout technology at its store in Cologne, Germany. Tesco, a U.K. supermarket chain, is also testing Trigo's checkout technology.

Walmart Employing AI to Improve Grocery Substitutions

Walmart developed an AI-based technology to help personal shoppers and customers make better substitutions for out-of-stock products by considering hundreds of variables, such as size, brand, individual preference, and price, in real time. Substitutions presented a challenge during the global pandemic, as popular items sold out rapidly. Walmart said that since deploying the solution, customer acceptance of online grocery substitutions has increased more than 95%.

The pandemic has served as a catalyst for technology adoption in the retail space, creating an imperative for companies to reconfigure their operations.

Bringg Secures \$100M in Financing for Last-Mile Delivery Platform

Bringg, a software provider that helps retailers with last-mile logistics, raised \$100 million in a Series E round. The funding values the company at about \$1 billion, an increase of approximately four times its previous valuation. In the past year, the company saw a 180% increase in new customers. Bringg plans to use the funding to further expand its customer base, build out its capabilities, and likely acquire other companies to consolidate some of the links in the logistics

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SECTOR AND INDUSTRY SIGNALS (CONT'D)

and fulfillment chain. Among Bringg's current customers are Walmart, Albertsons, Co-Op in the U.K., Coca-Cola, and Panera.

Supply Chain Disruption

As shifting consumer habits cause more rapid inventory churn, a lack of supply chain visibility has resulted in delays, higher costs, and both lost and shrinking sales. In response, retailers are reconsidering supply chain operations and resiliency, prompting new investments in data analytics, deep learning and machine learning, automation, and AI-enabled supply chain management to reduce logistics costs, optimize

demand forecasting, streamline operations, and enhance omnichannel fulfillment. Order fulfillment is expected to see the most investment, followed by warehouse management and procurement. Companies are experimenting with various solutions, from robots to augmented reality/virtual reality, to automate and improve store and warehouse operations. Although the rollout of robots in retail slowed in 2020 as other projects took priority, robotics is expected to play an expanded role in the retail industry, with some businesses establishing robot-powered micro-fulfillment centers.



HEIGHTENED DEMAND FOR SAME-DAY FULFILLMENT AND CONVENIENCE OPTIONS SUCH AS CURBSIDE PICKUP AND BOPIS HAVE PUT PRESSURE ON EXISTING DISTRIBUTION MODELS.

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IMPACT

Economic

While the pandemic resulted in both temporary and permanent store closures, it also helped accelerate the shift to an omnichannel shopping model, providing consumers with more purchase options and increasing potential touchpoints between consumers and retailers as the economy begins to recover. New retail technologies deployed during the pandemic have shown the potential to maintain economic activity even amid significant external pressures. Retail industry executives have called for ongoing financial stimulus for the retail sector to provide liquidity support so that companies, workers, and consumers can capitalize on the new consumer engagement channels created by the digital uptake.

Social

The disruption caused by the pandemic has accelerated the pace of change in the way that consumers interact with retailers and related businesses. The recent proliferation of e-commerce and advanced shopping technologies enabled more local retailers and restaurants to operate during lockdown through shared delivery services, click-and-collect models, and enhanced use of social commerce channels. Longer term, these changes may lead to a reprioritization of values, which could serve as a catalyst for new models of retail in which health and sustainability are larger drivers. Unemployment and income disparities accentuated by the pandemic, for instance, may also prompt an increase in traffic toward discount brands as consumers look to reduce costs.

Environmental

As consumers increasingly emphasize the need for sustainable and environmentally conscious products, technology innovations in the supply chain provide an opportunity to not only meet consumer expectations and build brand loyalty, but also reduce environmental footprints and externalities. With e-commerce reshaping supply chains, there is an opportunity to implement sustainable

practices throughout supply chain processes, utilizing more efficient technologies. Efforts to improve efficiency in the supply chain can be aligned with efforts to integrate end-to-end sustainability and reduce emissions. For instance, retailers are considering ways to implement sustainability into last-mile delivery efforts, including by leveraging greener delivery options such as electric vehicles and drones, and by communicating CO2 delivery footprints. Retailers are also employing e-commerce platforms and reverse logistics, supported by technologies such as blockchain, RFID (radio-frequency identification), and digital authentication, to facilitate re-commerce and expand corporate sustainability efforts.

Policy

In tandem with the growth of e-commerce, there has been an increase in counterfeit goods, prompting U.S. House lawmakers to review a bill that would hold e-commerce marketplaces liable under trademark law for fraudulent products sold on their platforms. E-commerce platforms and marketplaces, such as Amazon, have also invested significant sums to support anti-counterfeiting efforts.

Separately, the emerging appeal of in-app commerce has generated litigation between app developers and app store owners over where and how users pay for in-app purchases. Outside of the courts, state legislatures are considering wading into these issues. Early in 2021, an Arizona bill to allow developers to use their own payment systems to process in-app purchases passed the state house before failing in the senate. It is one of several bills targeting the fees charged to developers for payments made for apps and in-app purchases. Similar legislation is being considered in other states, including Georgia, Hawaii, Illinois, New York, Massachusetts, and Minnesota. North Dakota voted down a similar proposal. App industry groups, such as the Coalition for App Fairness, have supported the legislation. Federal legislators, for their part, have considered the issue as part of broader antitrust conversations about big tech.

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LEGAL IMPLICATIONS

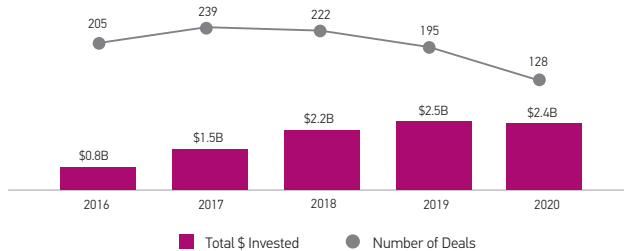
OUTLOOK

Transactions and Financing | Tech Funding, M&A Deal Activity, and Public Listings on the Rise

There is an active private equity/venture capital (PE/VC) ecosystem for retail and e-commerce technology. In Q2 2021, funding reached \$31.5 billion, up almost 40% over Q1 2021. Retail tech funding is slated to more than double the annual investment in each of the past four years, with e-commerce driving higher valuations and larger rounds. In Q2, there were 71 mega rounds valued at over \$100 million. Although VC activity has declined, the average deal size increased to \$11 million in 2020, compared to \$9.5 million the previous year.

U.S. ANNUAL VENTURE FUNDING IN E-COMMERCE TECHNOLOGY

Includes seed venture, corporate, and PE for venture-backed companies
Data as of Jan. 7, 2021



Source: Crunchbase News

The retail and e-commerce space is also generating mergers and acquisitions activity. Across all market segments and company sizes, the first half of 2020 set a record with 794 mergers and acquisitions involving e-commerce software, platforms, and marketplaces. Total deal value and deal numbers across the space increased in 2020 and into 2021. One niche area attracting more deal activity is headless e-commerce—which is seeing increasing funding and an uptick in bolt-on acquisitions. Retailers may explore new deals and partnerships as they implement new retail models and innovations to meet shifting consumer habits. For instance,

retailers are turning to tech acquisitions to support the reconfiguration of stores as fulfillment centers and to support last-mile delivery. Investors are also exhibiting a stronger appetite for last-mile logistics providers and supply chain optimization technology companies.

As a signal of the retail technology sector's growth and capital attraction, more companies are going public. The top 100 retail tech companies in 2020 identified by CB Insights raised over \$14.8 billion in total equity funding across 400 deals—and the list of the top 100 included 19 unicorns. With digital acceleration cited as an investment priority by retail executives, funding and deal activity will likely continue apace.

Cybersecurity | Risks Increase as Attack Surface Expands

Security threats are on the rise as retailers move online, implement IoT devices, and employ new applications and platforms, increasing the number and scope of areas that are potentially vulnerable to attack. Consumers may have privacy concerns over data collection technology, particularly in physical stores, which have no opt-out option for tracking. Store networks and point-of-sale systems are becoming high-value targets. With new avenues for intrusion emerging, security will be a key focus for retail organizations, requiring robust security and an integration of security strategy and cyber defense capabilities. More states are also expected to implement consumer privacy protections in the near term, with lawmakers and regulators alike focusing attention on how companies handle consumer data and protect against cyberattacks.

Privacy | Compliance Critical as Regulations Evolve

As more consumers shop online, privacy becomes an increasingly important consideration for retailers. With state lawmakers enacting a patchwork of new privacy regulations—including Virginia's recently enacted Consumer Data Protection Act (CDPA) and laws being considered in more than a dozen other states—retailers need to be cognizant of their compliance obligations.

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LEGAL IMPLICATIONS (CONT'D)

Some new technologies may have implications under more than one privacy act or regulation—for example, virtual try-ons involve compliance with biometric laws and applicable state privacy legislation. Businesses should also be cognizant that new business channels—such as social commerce—may raise privacy implications. The questions of who acts as the merchant of record, and who is responsible for making consumer disclosures, maintaining data security, and processing returns, are all key considerations for retailers.

Product Liability | E-Commerce Platforms Face Increased Claims

In past years, e-commerce platforms were not held liable in U.S. courts for injuries caused by products sold on their platforms because they were held to be facilitators of third-party transactions. Recent developments suggest this may be changing—and courts may view e-commerce platforms as essential links in the supply chain—shifting greater liability risk onto e-retailers. In August 2020, for example, a California state appellate court reversed a decision that had found an e-commerce platform was not liable for an exploding battery because it was merely an “online marketplace.” This is an area that should be closely monitored as it evolves.

Trademarks | Law May Need to Evolve to Address AI

AI is changing how consumers buy products, acting as a filter between consumers, products, and brands, and serving as something akin to a personal shopper. Rather than merely being responsive to consumer demands, AI makes retail

more predictive, raising new questions about trademark law involving the purchasing process and interactions between consumers and brands. AI also has implications for who is considered an average consumer in trademark infringement cases, issues of liability, and comparative advertising.

PATENT TRENDS AND OUTLOOK

As businesses engage in an innovation race, intellectual property will undoubtedly play a key role. A few signals point to significant patent activity within the e-commerce and retail tech space. First, Instacart acquired 250 patents from IBM in February 2021. Second, e-commerce company Shopify has been building its IP portfolio and exploring new patent innovations. A notable development, however, is that Shopify joined the Open Invention Network, the largest patent nonaggression community in history, emphasizing its commitment to open source software.

Overall, the total number of patents granted in the United States in 2020 reached 352,013, representing a decline of just under 1% compared to 2019. However, patent applications increased nearly 5%, a signal of a potential increase in years to come. IBM had the highest number of patents granted. A key area of patent activity is artificial intelligence, as companies look to automate and improve efficiency.

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ABOUT US

Technology Transactions & Privacy | Retail & E-Commerce

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