



E-commerce Optimization

Time for online sellers to embrace return prevention tech

FIRST ANALYSIS QUARTERLY INSIGHT

Integrative insights on emerging opportunities

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 **First Analysis**

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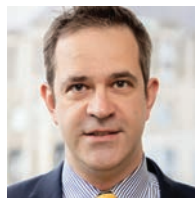
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David Gearhart has worked in finance and investment for two decades and joined First Analysis in 2011. He works with entrepreneurs as an investor and as an advisor on growth transactions to help build leading Internet of Things and e-commerce software businesses. He has played a key role in building First Analysis' Internet of Things and e-commerce franchises and is a thought leader in his sectors, having authored several widely read white papers. He supports First Analysis' investments in CoolR Group, EdgelQ, Freeosk and Smart-Commerce. Prior to joining First Analysis, he was an accountant with The Northern Trust Co. and an options broker with American Option Services. He earned a bachelor's degree from Purdue University with a concentration in economics and finance and his MBA at DePaul University with a focus on finance and entrepreneurship. He is a CFA charterholder.



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About First Analysis

First Analysis has a four-decade record of serving emerging growth companies, established industry leaders and institutional investors in emerging high-growth segments in technology and healthcare, both through its venture capital investments and through First Analysis Securities Corp. (FASC), which provides investment banking and related services. FASC is a FINRA-registered broker-dealer and member SIPC. First Analysis' integrative research process underpins all its efforts, combining 1) dynamic investment research on thousands of companies with 2) thousands of relationships among executives, investors and other key participants in our focus areas, yielding a deep, comprehensive understanding of each sector's near-term and long-term potential.

E-COMMERCE OPTIMIZATION

Time for online sellers to embrace return prevention tech

- Online return rates are significantly higher than traditional retail return rates, with 30% of online orders being returned compared to just 9% for physical stores.
- Returns are a significant financial burden for online sellers. They reduce revenue and increase costs, eroding margins. In fact, 80% of retailers categorize return-related costs as "significant to severe." Since e-commerce has been growing 7.5% annually, the direct and indirect costs of returns for online sellers will likely increase at a similar pace.
- We believe it is possible for online sellers to use return prevention technology to drive e-commerce return rates down to match traditional retail rates, moving from 3:1 to 1:1. We highlight several solution types we believe are most relevant to preventing returns and profile a promising company in each category.

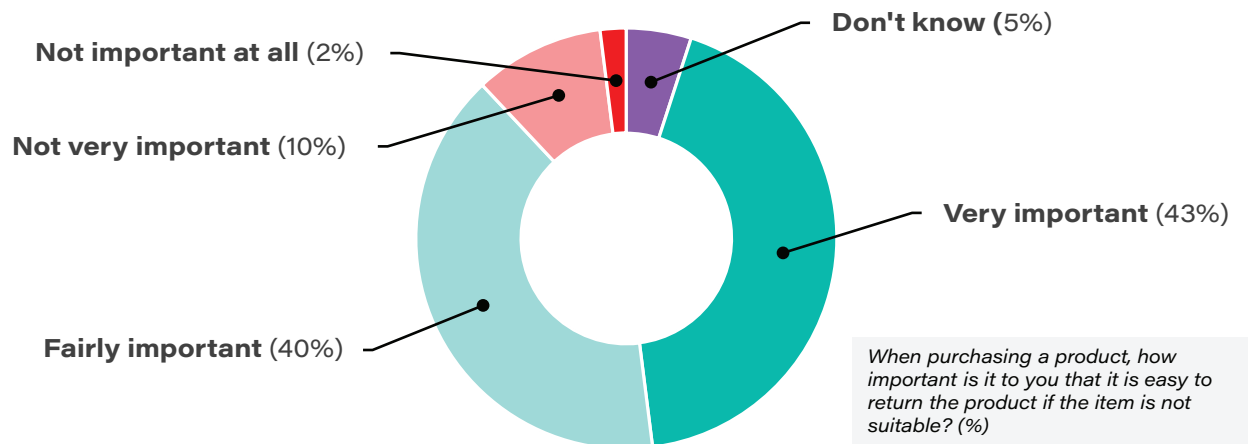
ACCEPTING RETURNS HAS BECOME THE STANDARD, BUT IT'S EXPENSIVE

Consumers have come to expect online and in-store sellers to offer reasonable return policies. Such policies – which clear-

ly outline what items are eligible, return timelines, item condition requirements, and processes – have long been the industry standard for sellers. The option to return purchases is a key consideration in consumers' purchase decisions. It reduces pressure at the point of sale and gives buyers greater confidence by lowering their risk from making poor or unsuitable purchase decisions. In fact, many consumers won't buy from a seller that doesn't offer returns, instead choosing one of the many competitors that do. Over 60% of consumers check return policies before buying, and rigid or inconvenient policies can quickly drive them elsewhere. As a result, offering returns has become essential for sellers to remain competitive.

But offering returns is expensive. Accepting returns involves costs for processing returns, refurbishing damaged returns, restocking returned products, and disposing of unsellable returns. These tasks require labor, transportation and space. And sellers generally can't recoup their costs by charging return shipping and restocking fees: Free returns have become standard, so such fees simply drive consumers to competitors offering free returns. According to PowerReviews, 76% of consumers prioritize free returns. A Klarna survey

TABLE 1: Easy returns are important for a majority of consumers when purchasing products



Source: YouGov.

found 70% of online consumers would stop buying from retailers that ceased offering free returns.

RETURNS ARE A BIGGER ISSUE FOR E-COMMERCE

Returns are a much bigger issue for online sellers than for physical stores. Online return rates are significantly higher than traditional retail return rates, with 30% of online orders on average across all product categories being returned compared to just 9% for physical stores, about a 3 to 1 ratio. In dollar terms, \$247 billion of the \$1.4 trillion in online sales in 2023 were returned, compared to \$371 billion of \$3.7 trillion sales for physical stores. That data may even understate the gap, since many retailers do not disclose return data. Since e-commerce has been growing 7.5% annually, the returns issue for online sellers will likely only become more pressing: The more goods that are purchased online, the more that will be returned. Unless online sellers can sufficiently reduce their return rates or their cost of processing returns, they'll need to increase their investment in physical capacity, people and technology to keep pace with the increase in returns that comes with increased sales volume.

A number of factors account for online sellers' higher return rates. First, while the selection of goods online sellers can offer is not limited by physical retail space, enabling them to offer a much larger selection, their customers have more limited ability to experience the products directly, such as by feeling or trying on clothing before they buy. Upon delivery, they often discover products don't look, feel, fit or perform as anticipated. Second, products purchased online are subject to damage during delivery, unlike products buyers take home from physical stores. Third, online sellers may ship the wrong product or ship products with parts missing; an in-store buyer is less likely to walk out with the wrong product or a product missing parts.

Online sellers have often adopted seemingly odd strategies to deal with returns. While some leverage existing physical infrastructure, such as their own physical stores or partner stores, to minimize return processing and transportation costs, many assume high returns costs are an unavoidable part of doing business and invest little in minimizing costs or optimizing processes. Some issue refunds (and even replacements) without requiring products to be returned, letting customers keep the original product, no questions asked. This is understandable

for low-value goods, but it's surprising in the case of more expensive items. We highlight a few anecdotes:

- A poorly painted Radio Flyer classic 10-inch kids tricycle purchased on Amazon: Seller issued a full refund and noted the bike could be kept by the buyer or donated to charity.
- A patio firepit bought on Walmart.com with several parts missing: Seller sent a new, unopened set as a replacement, noting the buyer could use or dispose of the first one.
- A (brand-name) smartphone case delivered in the wrong color: Seller sent the correct item and did not ask the buyer to return the original.

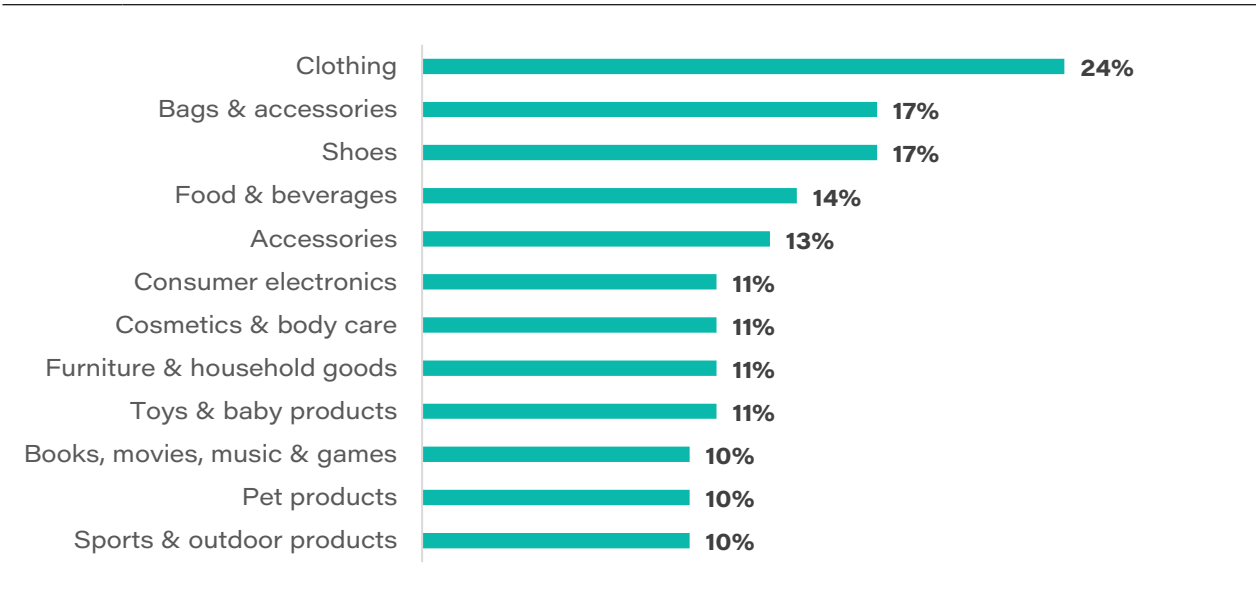
While these examples highlight the severity of the return problem, they also underscore the value of solving it. We think technology across many disciplines can reduce and optimize returns. We think the problem is only going to grow and is reaching a point where such technology is imperative, creating a strong tailwind for return technology companies.

WHAT GETS RETURNED AND WHERE?

Return rates vary significantly by product category (see Table 2). Unsurprisingly, clothing led all categories with a 24% return rate in 2024, highlighting the importance of the in-person shopping experience for assessing fit, size and appearance, which historically have been difficult to represent online. Other fashion-related items, such as shoes and accessories, followed closely behind. This underscores that some online sellers are more exposed to returns than others, based on type and mix of products, and have greater returns cost burdens.

Similarly, the way online returns are handled can vary widely depending on sellers' policies and customer preferences. An online return may start with a return request or an online workflow that generates a shipping label. Outcomes can include a refund to the credit card used for the original purchase or an exchange credit for a replacement item. Sometimes the seller may convince the buyer to keep the original item by offering a partial refund of the original purchase price.

TABLE 2: Most returned products online (2024)



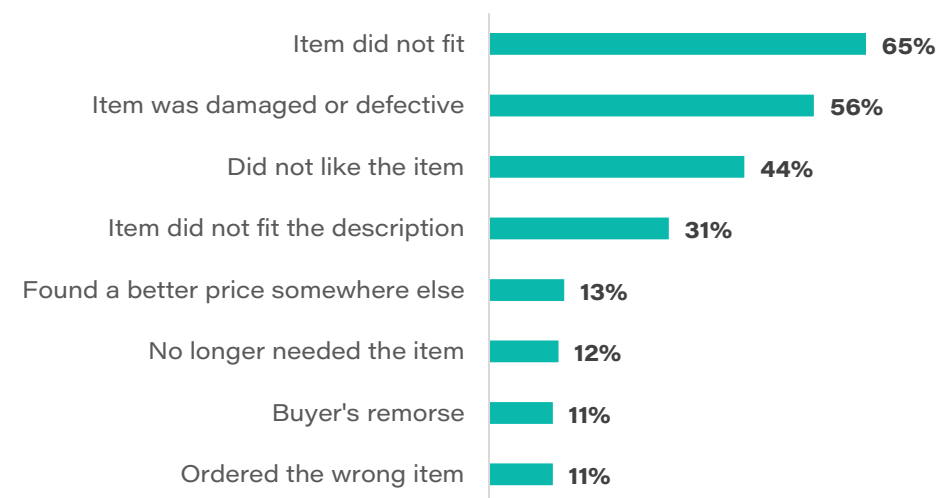
Source: Oberlo.

Buyers may return purchases to physical stores, the post office, or third-party carriers like FedEx and UPS. Some sellers offer home pickup or partner with physical stores to accept returns, making the process more convenient. For example, Amazon accepts returns at Kohl's.

ROOT CAUSES OF RETURNS

There are many reasons for online returns. Some apply to only certain product categories. Below, we highlight several reasons, along with the most applicable product categories.

- 1) Wrong size.** Size issues and poor fit are major drivers of online returns, since buyers can't try on or handle products before purchasing. This is especially the case for categories like clothing, footwear, jewelry, furniture and accessories, where touch and feel are critical. Currently, size charts do little to solve the problem. 80% of consumers find them unhelpful, many citing inaccurate or confusing measurements. These shortcomings create frustration, lead to high return rates, and underscore the need for better sizing and visualization tools.
- 2) Doesn't match description.** Items that don't match their descriptions are a common cause of returns. Product images and specifications may be missing, incomplete, inaccurate or poor quality, leaving buyers with mistaken or unclear expectations. This issue can affect all product categories.
- 3) Damaged, broken, defective.** Product damage often results from packaging that fails to protect products during shipping. This can be due to low-quality materials, lack of cushioning, or packaging that's not suited for the product's size, weight, or fragility. Products such as electronics, glassware and home goods are most affected. Defects and damage can also result from manufacturing and packaging problems prior to shipment.
- 4) Missing parts, wrong parts.** Manufacturing problems, human error, inadequate training, inadequate inspection procedures, and lack of standardization are among the factors that cause products to be shipped with missing or wrong parts. Examples of products most prone to this include furniture, electronics, tools and do-it-yourself kits.
- 5) Wrong item.** Picking and other fulfillment errors often cause buyers to receive the wrong item. This issue is more common with high-volume or visually similar products, especially in categories like apparel and consumer electronics.
- 6) Performance shortfalls.** Product performance issues generally stem from manufacturing defects or quality control failures. Buyers expect products, especially electronics and appliances, to function as advertised and meet quality standards.
- 7) Buyer errors.** Buyers inevitably make mistakes when ordering, such as selecting the wrong size, color, quantity or product option. Unclear product information and complex ordering interfaces often contribute to these errors. These mistakes are particularly common in apparel, footwear and electronics.
- 8) Late delivery.** Late deliveries can push buyers to buy the same or similar products elsewhere and return the original order when it eventually arrives. Timely delivery is critical, especially during high-demand periods. This issue affects all product categories but is especially noticeable with time-sensitive products such as apparel and seasonal products, including gifts.
- 9) No longer needed.** Buyers may return products when they no longer need or can no longer afford an item due

TABLE 3: Top reasons for item returns**Calculating return rates**

Return rates are generally calculated in one of two ways: (1) returned revenue as a percentage of total revenue, or (2) returned units as a percentage of total units sold.

However, the actual numbers presented by industry participants are often not apples-to-apples, as factors like (partial) refunds or discounts, exchanges (for different products or even variants), and store credit can affect the calculation, making it difficult to capture true return rates. This variability makes it crucial to interpret return rate metrics in the context of companies' specific policies and customer behavior.

Source: First Analysis, Shopify.

a change in personal circumstances. This happens across most product categories.

10) Changed mind. Even if products meet buyers' expectations and are in perfect condition, buyers may simply change their mind about a purchase, as in the case of an impulse purchase the buyer later decides really doesn't make sense.

11) Abuse. Some consumers abuse return policies. Two examples are wardrobing and bracketing. Wardrobing occurs when a buyer purchases a product for a specific occasion, wears it once, and then returns it. While this often violates return policies, sellers frequently accept such returns and cover associated costs to maintain customer satisfaction. Bracketing involves purchasing multiple variations of a product, such as different sizes or colors, with the intention of keeping only one. While not necessarily fraudulent, bracketing ties up inventory and

prevents those products from being sold to other customers, resulting in lost sales opportunities. Both practices pose serious challenges for sellers by increasing costs and disrupting inventory management.

12) Fraud. Fraud takes many forms, from petty scams to highly sophisticated schemes. In a common example, buyers falsely claim they never received an order or that a product arrived damaged and request a replacement, refund or discount. The buyer keeps or resells the original shipment. An example of more sophisticated fraud is stealing or cloning sellers' point-of-sale systems to process fake returns onto prepaid cards. Fraudsters use these tactics to generate refunds and convert stolen transactions into cash, often evading detection. These schemes result in significant financial losses and create inventory discrepancies, making it harder for sellers to identify fraud.

Two common examples of RETURN ABUSE



Wardrobing

Buying an item for a special occasion or holiday and then returning it after wearing it



Bracketing

Buying multiple versions of a product in different colors or sizes, then keeping the one you like best and returning the others

Source: First Analysis.

HOW E-COMMERCE RETURNS ARE HANDLED TODAY

E-commerce returns can be made via several methods, some of which prioritize convenience for buyers and help online sellers manage return costs. In most cases, the process begins online, where buyers initiate returns through digital forms or workflows that notify sellers that items are in transit to designated warehouses, physical stores or partner drop-off points. For products purchased online from marketplaces, brands and sellers that also operate physical stores, buyers can return them to the physical store – a familiar option that also benefits retailers by driving additional foot traffic and purchases. About two-thirds of consumers buy something in physical stores during their visits to return products. Some online-only sellers accept drop-off returns through partner companies with physical stores. Most online sellers also provide buyers the option to return products via carriers such as the U.S. Postal Service, UPS and FedEx using pre-printed or digital shipping labels. This option is especially useful for shoppers in rural areas and those with health or mobility constraints.

This emphasis on ease and accessibility plays directly into consumer decision-making and loyalty. Nearly 83% of consumers view easy returns as a crucial part of the purchase experience, seek-

ing a process that saves time and minimizes effort. When returns are simple, accessible and seamless, they help build confidence and goodwill and ultimately strengthen sellers' reputations and long-term customer relationships.

RETURNS ARE COSTLY

Returns are a significant financial burden to online sellers. They reduce revenue and increase costs, eroding margins. In fact, 80% of retailers categorize return-related costs as "significant to severe," according to ReverseLogix. Return costs generally fall into one of two categories: direct and indirect. Direct costs are hard-dollar and other measurable



Marketplace sellers like Amazon have built vast return networks, offering over 8,000 drop-off locations through partners like Whole Foods and Staples. This is to ensure that four out of five buyers have a return point within five miles of their homes. These locations often do not require return packaging or printed labels – buyers simply scan a mobile QR code and leave the product. The experience is frictionless and aligns with modern convenience expectations and standards. In-person returns remain the most popular method, with 67% of consumers preferring them for their speed and simplicity. However, proximity matters: while 94% of consumers are willing to travel two miles for a return, that number drops to 82% at five miles. By expanding access through partner locations, retailers are making returns more accessible and satisfying customers.

expenses attributable to specific returns. Indirect costs are implied financial impacts that often have to be estimated.

Direct costs

Labor and processing. Returns require manual handling, which can be extensive. On average, a returned product is physically handled by seven people on its journey and at its destination. Employees must take receipt of the return and process it. This can include verifying purchase date, assessing condition, and deciding on next steps. Unused and undamaged items still being sold online or in-store are typically put back in stock for sale. For damaged and used items, employees decide whether to repair, refurbish and repackage them for resale or to liquidate or otherwise dispose of them. Despite advances in automation, human oversight remains critical to optimize accuracy, especially for quality assurance and handling exceptions. Hourly labor costs per employee, including warehouse workers' wages, typically range from \$15 to \$25, and an average return takes about an hour to process.

Storage and warehousing. Returned products take up valuable warehouse (and in-store retail) space that could otherwise be used to hold revenue-generating inventory, which creates both logistical and financial strains. Processing returns may require up to 20% more warehouse space relative to new product destined for sale due to the added steps of manual inspection, sorting, and repackaging – all of which disrupt the efficiency of standard outbound logistics workflows. Products that can't be resold must be stored pending liquidation or disposal, further tying up space. The costs associated with the additional space include utilities (electricity, heating, cooling), insurance, and security.

Reverse logistics and transportation costs. Reverse logistics costs – the costs of moving returned products from customers to stores or warehouses –

are typically greater than the costs of shipping new products. This is because returns follow different sets of rules and have different checkpoints in transit. They require specialized routing and non-standard pickup hours, potentially irregular locations, multiple transfer points, and extra handling, all of which increase time and expenses. Transportation can account for up to 60% of total return costs. Components include fuel, labor for transit and loading and unloading (U.S. truck drivers earn an average of \$31 per hour), and vehicle wear-and-tear and depreciation. Additionally, surcharges such as customs fees, special handling fees, warehousing fees during transit, and penalties for delays or non-compliance further increase the overall cost of managing returns.

Other direct costs typically include losses on items liquidated at a discount to cost and packaging costs, such as one-time and specialty packaging materials (dry ice, foil, bubble wrap).

All in, the cost to deal with returns often ranges from 20%-65% of products' original value according to Shopify, factoring in inventory devaluation and labor, transportation, packaging and storage costs. The impact on profit margin is significant. In Table 4, we share a realistic, representative example. If we assume the item returned was originally sold for \$100 and yielded a \$30 profit (30% gross margin), the return effectively erases that profit and the costs lead to a loss for the business – here over \$30 for that unit, assuming no exchange or sale of another item to that customer.

Indirect costs

Beyond the direct costs associated with returns, online sellers also incur material indirect expenses that are more difficult to quantify. These include the marketing spend to attract customers and encourage purchases, which is essentially lost when products are returned without exchanges or future purchases. Addition-

ally, poor return experiences diminish the likelihood customers will ever purchase again, amplifying the indirect cost.

Other indirect costs are opportunity costs related to inventory management and store operations. Returned products use valuable shelf and warehouse space that could otherwise be used to stock items that drive sales. In addition, there is an increasing environmental toll from returns, including waste from discarded products, packaging materials, and the carbon footprint generated by transportation and processing. These hidden costs contribute to broader financial and social impacts, making effective return management critical not only for profitability but also for sustainability.

TECH CAN CHANGE E-COMMERCE RETURN DYNAMICS AND REDUCE COSTS

We believe it is possible for e-commerce return rates eventually to match traditional retail rates, moving from 3:1 to 1:1. Online sellers have two levers to affect return rates and costs: policy and technology. Policy changes, such as charging

for return shipping and adding return restrictions, can be implemented quickly by online sellers but ultimately are ineffective and expensive. A study found that while 89% of retailers tightened return policies in the past year by increasing costs or adding restrictions, 59% still saw return rates rise. More importantly, stricter policies can erode customer trust and loyalty, ultimately driving consumers toward competitors with more flexible return conditions. We think tightening return policy is a losing proposition, and sellers should instead focus on technology to reduce return rates and costs.

There are two main categories of return solution technologies: **return prevention**, which focuses on reducing returns by addressing root causes, and **return management**, which improves return processing efficiency and lowers costs. The key distinction between the two is that the former is proactive while the latter is reactive. Each category features standalone and bundled offerings that focus on one or a subset of return issues. For this reason, we believe sellers need to adopt multiple solutions to address the full breadth of their needs.

We think return prevention technologies hold the most promise, because reducing return rates inherently reduces return processing costs. Return prevention solutions work one of two ways. First, they can provide sellers visibility into what causes returns so sellers can eliminate those causes. Second, they can better inform buyers so buyers make better purchase decisions. Either way, return prevention technologies help sellers regain focus on their core value drivers while improving customer retention and sellers' reputations. Most consumers do not want the hassle of returning products, so minimizing the incidence of returns leads to more positive reviews, stronger brand and seller perception, and increased customer loyalty.

That said, we believe return management solutions should not be overlooked. Some level of returns will always be inevitable. For this reason, post-shipment

Table 4: The real costs in the e-commerce customer returns process

Original order cost	
• Picking labor	\$4.75
• Packing labor	
• Shipping labor	
Shipping cost to customer	\$8.50
Customer return and reship process	
Customer service inquiry	\$4.50
Shipping retrain back to warehouse	\$5.50
Labor to process and refurbish returned item	\$3.60
Repackaging costs	\$0.30
• Putaway from returns	\$5.10
• Picking labor	
• Packing labor	
• Shipping labor	
Shipping back to customer	\$8.50
Total costs	\$40.75

Source: F. Curtis Barry & Company.

Return prevention

Aim to minimize return rates by leveraging data analytics to address root causes and enhance customer confidence through additional purchase details



Return management

Streamline the logistics and operations of product returns to ensure efficient handling and disposition of items while reducing costs

Source: First Analysis.

solutions will be needed to streamline return operations and minimize costs. There are many players in this space, and we highlight a few examples of firms that have carved out niches and are making an impact.

RETURN GO

ReturnGO, based in New Castle, Delaware, is a sustainable return management platform designed to optimize post-purchase processes, reduce waste and boost revenue. By partnering with eco-friendly logistics providers, ReturnGO aims to lower the carbon footprint of return shipping. Its platform offers a customizable, self-service portal directly integrated into its clients' stores, handling exchanges, price adjustments and smart refund alternatives. It also includes advanced analytics for return policy optimization and supports flexible options like store credits, item donations and print-less returns. With features like unified tracking, real-time notifications and automation for return processing, ReturnGO boosts customer satisfaction and reduces costs, achieving a 39% increase in retained revenue, \$1.95 more revenue per return, \$3.40 in logistics costs saved per return, and a 15% reduction in carbon footprint.



CONTINUUM

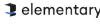
Chicago-based **Continuum AI** provides business-to-business sellers with a platform for automated returns, warranties,

and repairs management. It streamlines reverse logistics by centralizing return merchandise authorization (RMA) processing, automating reconciliation, and integrating with enterprise resource planning, customer relationship management, and e-commerce systems to reduce disputes and recover vendor credits. The platform offers four key solutions: Customer Hub, Warehouse Hub, Finance Hub and Manufacturer Warranty Hub. Customer Hub automates RMA processing with a self-service portal and real-time tracking. Warehouse Hub optimizes inventory management and team coordination. Finance Hub streamlines vendor credit recovery and reconciliation. Manufacturer Warranty Hub enhances collaboration between manufacturers and distributors. By automating these processes, Continuum AI reduces costs, improves profitability and enhances customer satisfaction.

NOTABLE RETURN PREVENTION TECHNOLOGIES

A variety of solutions have an impact on return rates and can be classified as returns prevention technologies. Some were purposely designed to address the root causes of online returns. Others were created to solve entirely different use cases in e-commerce or other markets and are not normally considered return technologies. Regardless of this distinction, many are essentially point solutions sold standalone and targeting one or a few root causes. While each can have a meaningful impact on returns by itself, it makes sense to combine disparate capabilities and solutions in one offering, independently or via partnerships,

TABLE 5: A sampling of return solutions by category

Analytics Returnalyze qualtrics thematic newmine Talkwalker RETURNLOGIC loop returnless. emplifi Birdeye Swap Saara Cloutrack VERINT. 12 return ReverseLogix Brandwatch	Augmented reality, virtual reality and 3D imaging 3DLOOK MySize VVV perfitly auglio Threedium Vue.ai REYDAR reali nfinite LiquidPixels Imajize threekit	Computer vision and scanning emergent frate COGNEX PLAINSIGHT REDBOT FlexibleVision EPIC ThruWave elementary BASLER ZEBRA ivs	
Content moderation and compliance Vue.ai MetricsCart mindcrest oculus mindsite mFilterIt DATAWEAVE	Fraud and abuse detection APPRISS RETAIL eye4fraud Fraud.net veratad FORTER frate loop Saara ClearSale Freeing Returns Chargebacks911 MAXMIND SEON NOFRAUD ReverseLogix	Reviews Monitoring and analysis Yogi OKENDO Typeform emplifi cloutly Birdeye Trustpilot bazaarvoice POWER REVIEWS QUANTRA Approved MetricsCart	
Asset tracking HANHAA loop SpotSee tive Reelables cargosense TAG-N-TRAC	User-generated content and tools tagbox emplifi videoly cloutly Birdeye YOT PO. Brandwatch	Customer feedback, survey and analysis Birdeye GetFeedback SurveySparrow innovate MR VERINT. thematic Cloutrack KNO momentive	Warehouse management BRIGHTPICK LIGHTNING PICK Supporteo EPG DEMATIC KNAPP

Source: First Analysis.

to provide online sellers more centralized and holistic data and control, enabling greater impact on returns and driving significantly more value. Below, we highlight several solution types we believe are most relevant to preventing returns. We identify the root causes they address, summarize their core features and functions, and profile a representative company in each category.

Asset tracking

Root causes affected: 3,8,9,10,11,12

Internet of Things (IoT) solutions, which combine wireless hardware with end-user application software and network connectivity and are becoming widespread, enable remote asset monitoring. Companies can track and monitor the condition of products throughout the supply chain

by placing wireless sensors on transportation and logistics assets, such as trailers, reusable shipping containers and pallets (see our [Shift to condition monitoring to finally drive connected pallet adoption](#)). Companies increasingly also have the option to place sensors on individual product packages. Sensors can detect and measure impact, shock, temperature, humidity and moisture. This real-time visibility into location and condition can be used in e-commerce fulfillment to identify and correct problems before they affect end customers. For example, software predicting a shipping delay can trigger remediation efforts, such as transferring the package to another carrier or route. Alternatively, sellers that see shipments being damaged by moisture in real time can ship replacement products immediately, ensuring its customers receive undamaged product with minimal delay. Companies can also aggregate their sensor data over time to

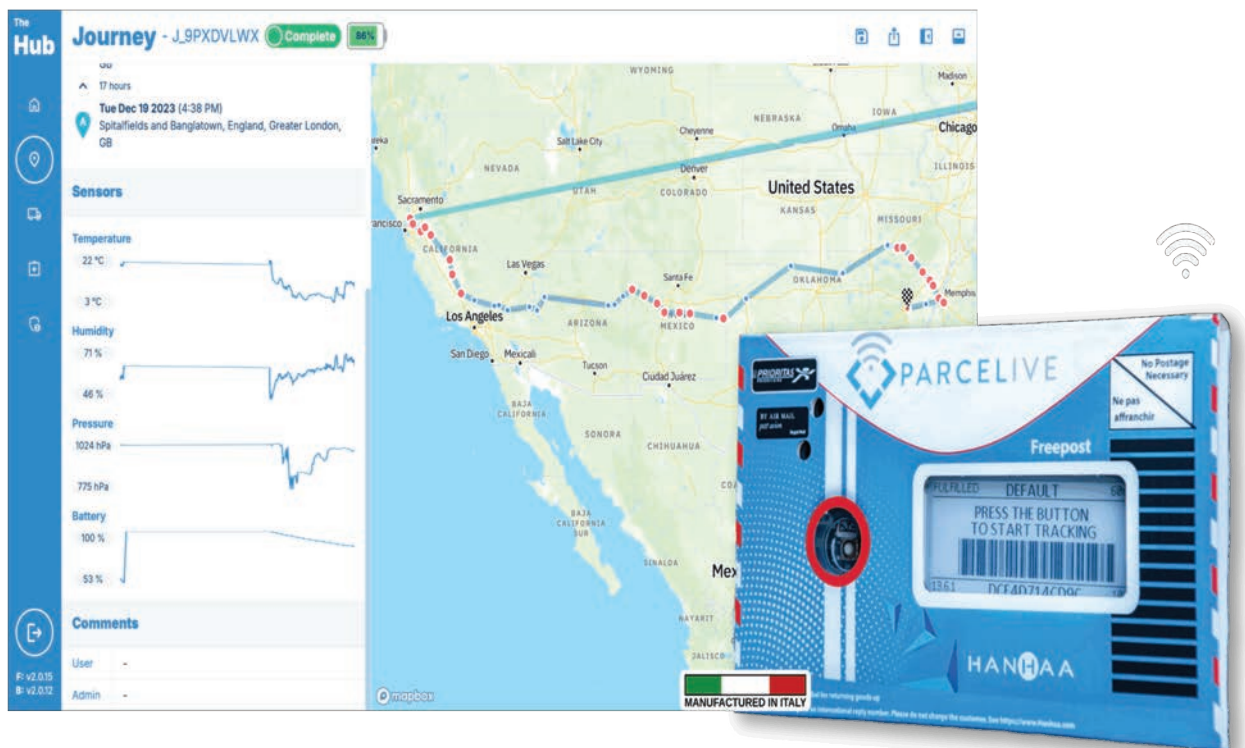
identify problem patterns, such as shipping delays, shipping damage, and lost shipments. With this information, they can modify processes, such as by changing shippers or shipping routes. This can improve delivery performance, optimize costs and improve customer satisfaction. Asset tracking can also help reduce fraud by verifying claims of product loss or damage.

HANHAA

SUPPLY CHAIN SOLUTIONS

London-based **Hanhaa Supply Chain Solutions** offers a comprehensive line of connected devices for condition monitoring and location tracking on land, at sea and in the air. Each device connects to Hanhaa's cloud-based application. The company's core product is **ParcelLive**, a low-cost reusable tracker that can be

Hanhaa's ParcelLive tracker and user interface



Source: Hanhaa Supply Chain Solutions.

secured to a pallet or container or placed inside packages. It features a replaceable cover and up to a 65-day battery life. Its embedded sensors capture data on location, temperature, humidity, light, orientation, shock and free falls and transmit it over the company's proprietary 5G network, Hanhaa XG. When shipping partners finish using a ParceLive device, they drop it in a mailbox for free return to Hanhaa, which then checks its health prior to putting it back in service. The company offers other trackers, including a compact rechargeable CAT-M1 tracker for small packages (MiniLive), a tracker with an embedded solar panel to enable a battery life over seven years (SolarLive), and an ultra-low-power LTE-M tracker for land-based shipments (AssetLive). Hanhaa's application visualizes the data, enabling users to view real-time location and condition data, pull details on reasons for alerts, and see sensor data mapped over the course of a journey. The application also allows users to set sensor thresholds for excursion alerts, create geofenc-

es, and export data to other systems such as telematics through its application programming interface. By using Hanhaa, third-party logistics providers and freight forwarders can reduce cargo damage and mishandling, detect and eliminate theft, reduce goods tampering, identify bottlenecks and better handle disputes.

Augmented reality (AR) and virtual reality (VR)

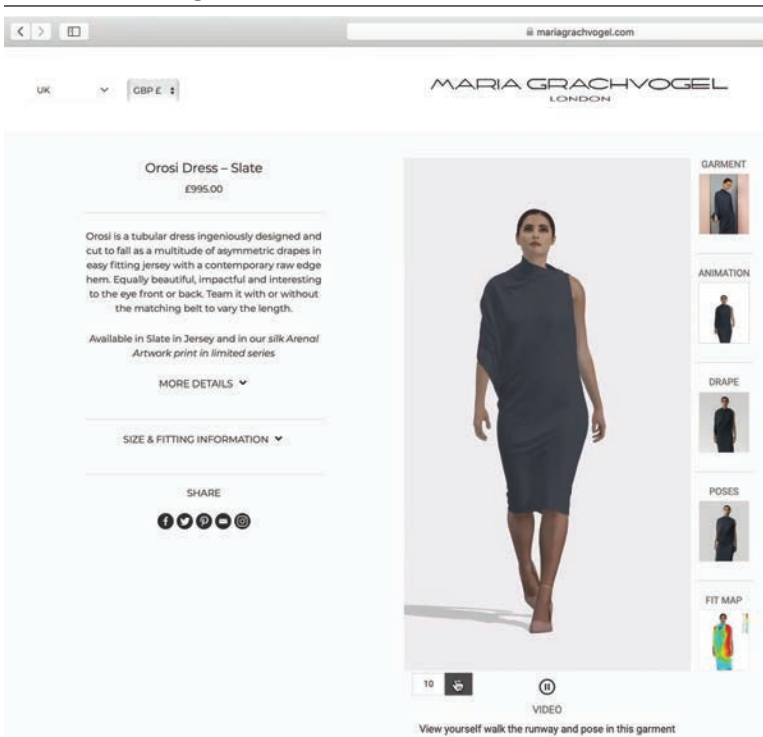
Root causes affected: 1,2,6,7,10

There is no substitute for trying on clothing and other apparel, touching products, and seeing them perform firsthand when making a purchase decision. It's difficult to replicate these experiences online, which is why clothing and other fashion products have the highest return rates. Augmented reality and virtual reality, which we explored in our report [Brands move toward VR and AR to deliver immersive e-commerce experiences](#), have improved dramatically over the years and are helping bridge the gap by enabling consumers to map clothing onto their images or avatars. This gives them a clearer sense of how products will look and fit before buying. Beyond fashion, augmented and virtual reality also benefits other products, such as by enabling consumers to visualize furniture in their homes, ensuring better alignment with their functional needs and aesthetic preferences. 84% of consumers say augmented reality improves their ability to assess products before buying. Additionally, 56% say augmented reality features increase their confidence in purchase decisions, thereby reducing return rates.

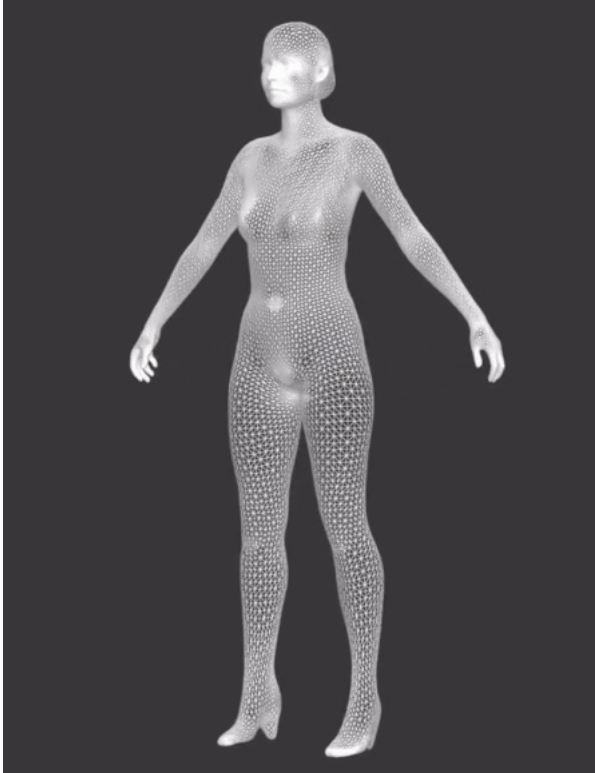


3DLook, based in New York, provides artificial intelligence (AI) driven three-dimensional body measuring solutions that enhance personalization, cut costs and boost sales and engagement for health and wellness, fashion, and uniform ap-

A virtual fitting room



Source: Modern Mirror.



Source: Modern Mirror.

parel. It offers two main products: FitXpress and Mobile Tailor. FitXpress uses AI body scanning to deliver accurate, real-time health data that tracks measurements, validates body mass index measurements, and monitors progress against personalized plans. This helps clients stay motivated and informed while enabling businesses to improve operational efficiency, boost engagement and enhance outcomes through reliable insights. Mobile Tailor simplifies measurements with AI by letting customers easily submit photos in-store and via website links, email and text and then receive precise measurements within 30 seconds. It integrates seamlessly with application programming interfaces to connect scans to three-dimensional designs, computer-aided design systems, configurators, and order management systems, ensuring accurate clothing fit and reducing returns by up to 20%.

Computer vision

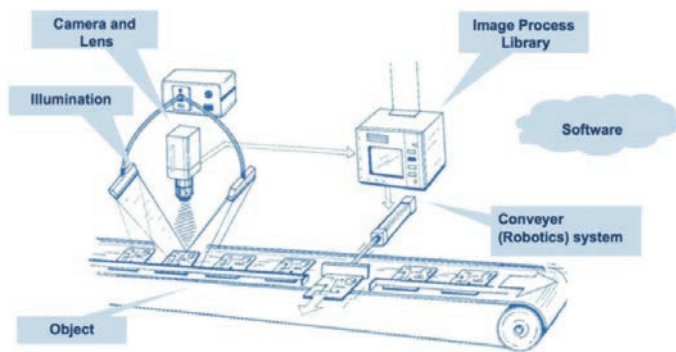
Root causes affected: 3,4,5

Camera systems increasingly leverage sophisticated software that enables them to recognize objects and detect their attributes. These solutions can be applied at various points in the value chain to reduce returns, from manufacturing to packaging and warehousing to fulfillment. Cameras can use computer-vision algorithms to identify products damaged during manufacturing, packaging and warehousing and to flag missing parts. These algorithms are rigorously trained for their exact use cases. They trigger workflows that ensure problem items do not get shipped. Camera systems can also validate that picked and packed products match their online purchase orders, flagging those that don't. Finally, cameras are being used to analyze products and their packaging, flag poor packaging, and recommend packaging design and material improvements to help ensure buyers don't receive damaged products.



As its name implies, **Emergent Vision Technologies**, based in Vancouver, British Columbia, provides innovative vision-based solutions for a variety of different vertical markets and applications. Its solutions are comprised of its proprietary area and line-scan Gigabit Ethernet cameras (available in different capture speeds and resolutions), which use Ethernet connections to transmit raw images to internal or third-party platforms for processing, and its eCapture-branded visualization and management software. eCapture enables users to view curated (or marked) images and configure settings like frame rates per second, resolution, camera triggering mechanisms, synchronization, and export

Computer vision in manufacturing for inspection



Source: XenonStack.

preferences, among other things. Inspection and automation is one of the company's core application areas. Here, the company offers solutions developed to inspect and verify parts during manufacturing and receiving processes as well as completed products during picking and packaging, warehousing and logistics phases. Analyzing images at high speed, its software finds defects and anomalies such as missing contents, incorrect

contents and sealing issues. It looks for deviations from acceptable patterns the underlying algorithms are trained on. Notably, some Emergent cameras take ultraviolet, infrared and polarized images, which offer advantages when inspecting items made from certain materials, that require fill levels to be checked or require adjustments to deal with reflections and distortions. Items identified as being defective trigger mechanisms that remove them from production and packaging processes and alert managers. The machine vision data captured is retained and continually augmented, providing insights that help managers address recurring issues and root causes, sometimes with other prevention technologies.

User-generated content (UGC)

Root causes affected: 1,2,6,10

User-generated content helps consumers make informed purchase decisions by providing high-quality reviews, detailed descriptions and customer photos. This enables buyers to develop more accu-

User-generated content

REDUCE PRODUCT RETURNS

Use UGC to create confident purchases.

Reducing return rates doesn't just save you time and money – it creates happier customers, too. Help your customers buy the right product, the first time. With solutions that allow you to answer their questions, respond to reviews, and find other answered queries, your customers are empowered to make the right purchasing decisions. They'll thank you for it. And so will your bottom line.

Q Are these running shoes true to size?

A Hey, thanks for your questions. We recommend sizing down one size on this particular pair of shoes.

Q I wish about 10 miles a week and my feet don't hurt at all when wearing them.

Q Comfort shoes I have ever owned and I get so many compliments.

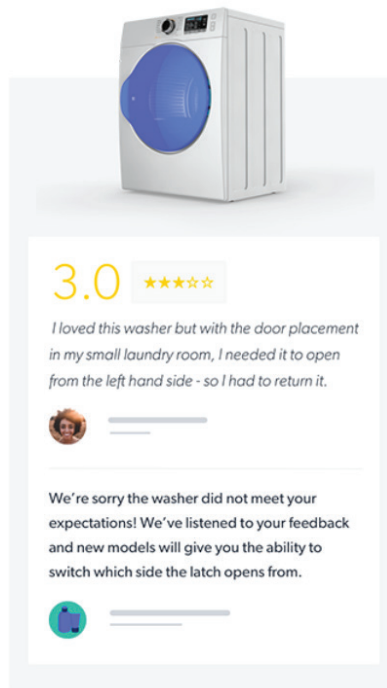
Source: Bazaarvoice.

rate expectations and boosts their confidence. Two-thirds of consumers say they'd be less likely to return a product if they had access to reviews, question-and-answer posts, or visual content beforehand. User-generated images and videos are especially effective in reducing returns for categories like clothing (by 78%), electronics (by 70%), home and garden (by 62%) and health and beauty (by 60%).



Tagbox, based in Covina, California, provides a user-generated content platform that helps businesses collect, curate and display customer content across websites, email campaigns, and digital signage. Its AI-powered tools enable brands to aggregate social media posts, reviews and visual content to enhance credibili-

Product change initiated by review posting



Source: Bazaarvoice.

ty and engagement. The platform offers seamless integration with major marketing and e-commerce platforms, making it easy to embed user-generated content into various channels. Tagbox also provides analytics to measure content performance and optimize user engagement. Its solutions help brands increase trust, improve conversions and enhance overall customer experience.

Reviews and feedback analysis

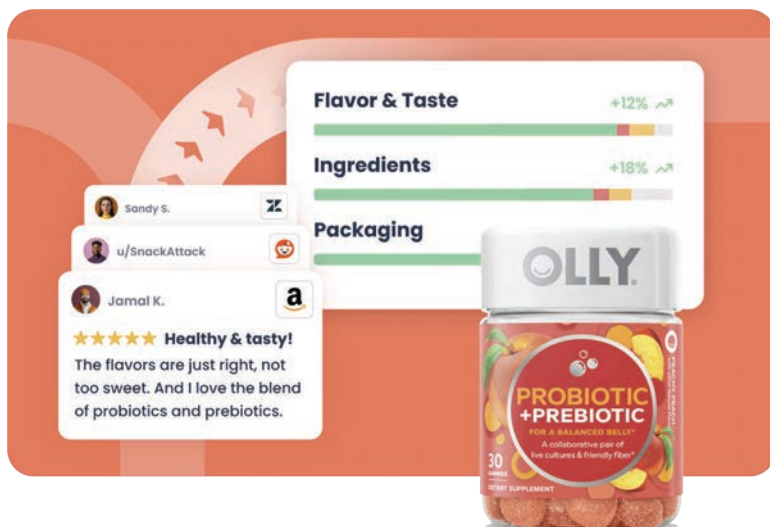
Root causes affected: 1,2,3,4,6

Brands and retailers can prevent returns by using software to scrape, analyze and interpret reviews, identifying recurring issues that lead to product dissatisfaction. This technology helps detect problems such as mismatched descriptions, fragile components and assembly difficulties, so sellers can address such problems. It also flags concerns related to damaged merchandise from manufacturers, which can negatively affect both product quality and customer experience. Without these insights, not only do sellers face higher return rates, but they also risk negative reviews, lost customer trust, and long-term damage to sales and brand reputation.



New York-based **Yogi** is a review data analytics platform aimed at omnichannel consumer brands. The company's dashboards deliver deep insights by mining reviews and ratings data and coupling it with customers' first-party data. Yogi aggregates review and rating data primarily by scraping publicly available source data and accessing reviews and rating data via its customers' first-party data. It then uses proprietary machine learning

Yogi's customer insights platform transforms shopper ratings, reviews and customer care interactions into actionable intelligence



Source: Yogi.

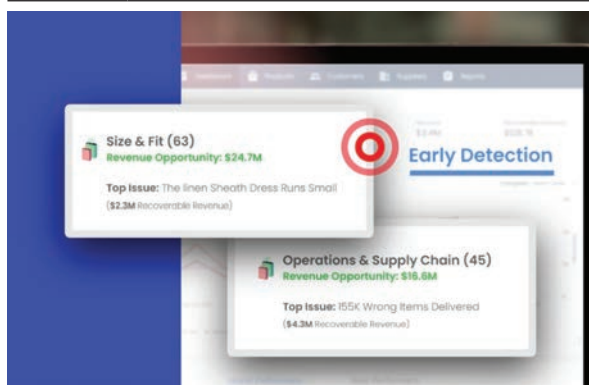
and natural language processing software to generate analyses of product and customer sentiment, reviews, ratings and competitive position.

Analytics

Root causes affected: All

Analytics solutions help sellers track real-time sales and return data to quickly flag products with high return rates. By analyzing return reason codes and customer behavior, they can improve

Detecting issues



Source: Returnalyze.

product descriptions and sizing guides and remove problematic products. Additionally, machine learning uses predictive models to identify patterns in customer behavior, product types and SKUs likely to be returned, enabling sellers to adjust merchandising and inventory or restrict certain products for specific customer segments.

Returnalyze

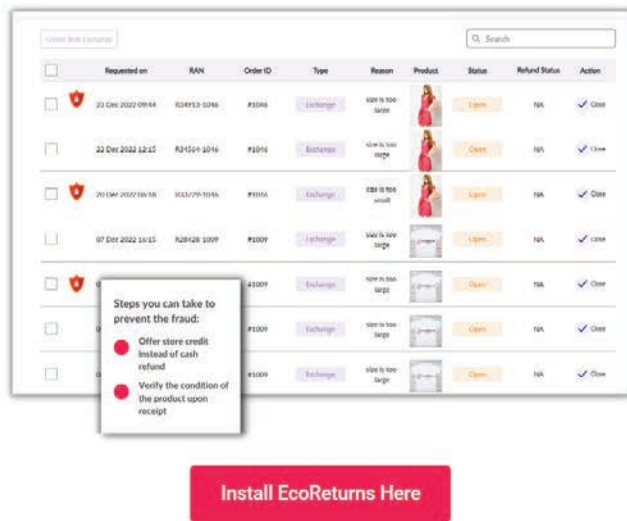
Returnalyze, based in Burlington, Massachusetts, is an AI-powered analytics company that helps retailers reduce returns, recover lost revenue and improve customer retention. Its platform offers full visibility into the return process and delivers actionable insights at the SKU level. By analyzing customer behaviors and return trends, it identifies root causes of returns and provides targeted recommendations, such as improving product descriptions, optimizing size and fit, fixing fulfillment errors, and adjusting

Software to identify issues and recommend corrective actions



Source: Returnalyze.

AI-powered software to flag and stop suspicious returns activity



Stop Fraud in its Tracks and Protect your Profits...

Our AI-powered **Returns Fraud Detection** system flags suspicious return and exchange requests along with possible reasons. Get suggestions on how you can prevent the fraudulent activity right on your dashboard. Some of the fraudulent activities that our system identifies for you:

- Customers engaging in wardrobing
- Customers returning incorrect products
- Customers creating fake accounts to return
- Customers creating fake address & contact details to receive refunds

Shield Your Business Against Returns Fraud With EcoReturns!

Source: Saara.

return policies to address these issues. The platform integrates smoothly with existing workflows, dashboards and data systems, allowing teams to easily access insights and take coordinated, data-driven actions.

Abuse and fraud

Root causes affected: 11,12

Abuse and fraud prevention solutions reduce returns by maintaining databases of individuals, identified by their IP addresses and other compliant metadata, linked to past fraudulent activity along with the conditions or parameters around these events. This allows businesses to deny returns or even block purchases from those identified as frequent offenders. These tools are often integrated into purchase approval processes during shopping cart checkout to catch suspicious behavior before transactions are completed. Additionally, they track customers with unusually high return rates and enforce policies that limit the number of returns allowed within specific time frames.

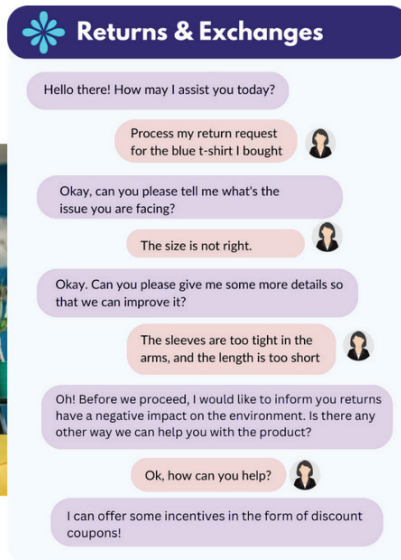


Appriss Retail, headquartered in Irvine, California, provides advanced AI-powered analytics and workflow solutions that help retailers reduce losses, optimize returns and improve operational decisions. It analyzes omnichannel transaction data to detect fraud, assess return risk and identify inefficiencies in real time. By uncovering sales-reducing activities like organized retail crime, employee theft and abusive returns, Appriss enables retailers to act while ensuring positive customer experiences. Its tools also simplify incident reporting, case management and audits, allowing teams to respond faster and maintain compliance. This creates a more proactive, data-driven approach to protecting margins and minimizing risk.

Other return solutions

Other types of return tools, such as personalized recommendations, targeted promotions, special offers and smart exchanges, can effectively reduce return

Offering incentives to reduce returns



Source: Saara.

rates. These solutions convert potential returns into purchases by guiding buyers toward better-fit alternatives or offering incentives to keep already-received products. For example, suggesting a different size or style can address fit issues, while timely discounts may encourage buyers to retain their purchases. By tailoring these strategies to consumer behavior and purchase history, sellers can reduce returns, cut logistics costs and increase customer lifetime value.

ATTRIBUTES OF ANTICIPATED WINNERS

We believe technologies that demonstrate clear and measurable return on investment – reducing returns and thereby reducing costs and improving revenue and customer satisfaction – are best positioned for long-term success and value creation for investors. These winners will strike a balance by addressing core

return challenges without overwhelming sellers or manufacturers with complex end-to-end systems. They will go to market in partnership with companies offering complementary, open, cloud-based solutions to enable seamless deployment. We also think those that target verticals with tailored solutions can address unique industry-specific return drivers, making them more effective and relevant than horizontal solutions.

PARTING THOUGHTS

We expect a handful of themes to play out in the return technology space over the next few years. First, while the market has been and continues to be heavily focused on post-purchase technologies, we anticipate there will be a resounding shift toward technology to prevent returns, both from an industry and investor perspective. We expect growing visibility and customer awareness, combined with compelling returns on investment, to drive increased online seller adoption of return prevention technology, particularly as they see early-adopter competitors achieving lower return rates. Second, advances in AI should enable disparate return prevention technologies to be integrated, enhancing visibility and decision making; without AI, this can be complex and expensive. Third, we think the return prevention space is poised for increased merger and acquisition activity as companies adopt strategies to combine multiple point solutions into comprehensive suites to attract online sellers looking for a single vendor to manage all their return needs. While we believe there is an opportunity to take a leadership position through this strategy, there is also risk of overextending, especially near term, as the market is still relatively new.

E-commerce optimization index ends with strong gain, but well below peak

The First Analysis E-commerce Optimization Index finished the one-year period through June 23 up 23%, having given up much of the 49.9% it had gained by early December. Nonetheless, the index's gain was ahead of the S&P 500's 10.6% and the Nasdaq's 12.2%.

The shares of 10 e-commerce optimization index constituents appreciated over the year, led by Twilio (TWLO) with a 115% gain, Shopify (SHOP) with a 71% gain and Yext (YEXT) with a 67% gain. Shopify, which had the second-largest market capitalization at the beginning of the period, accounted for about half the

E-commerce optimization public comparables*

(\$ in millions)

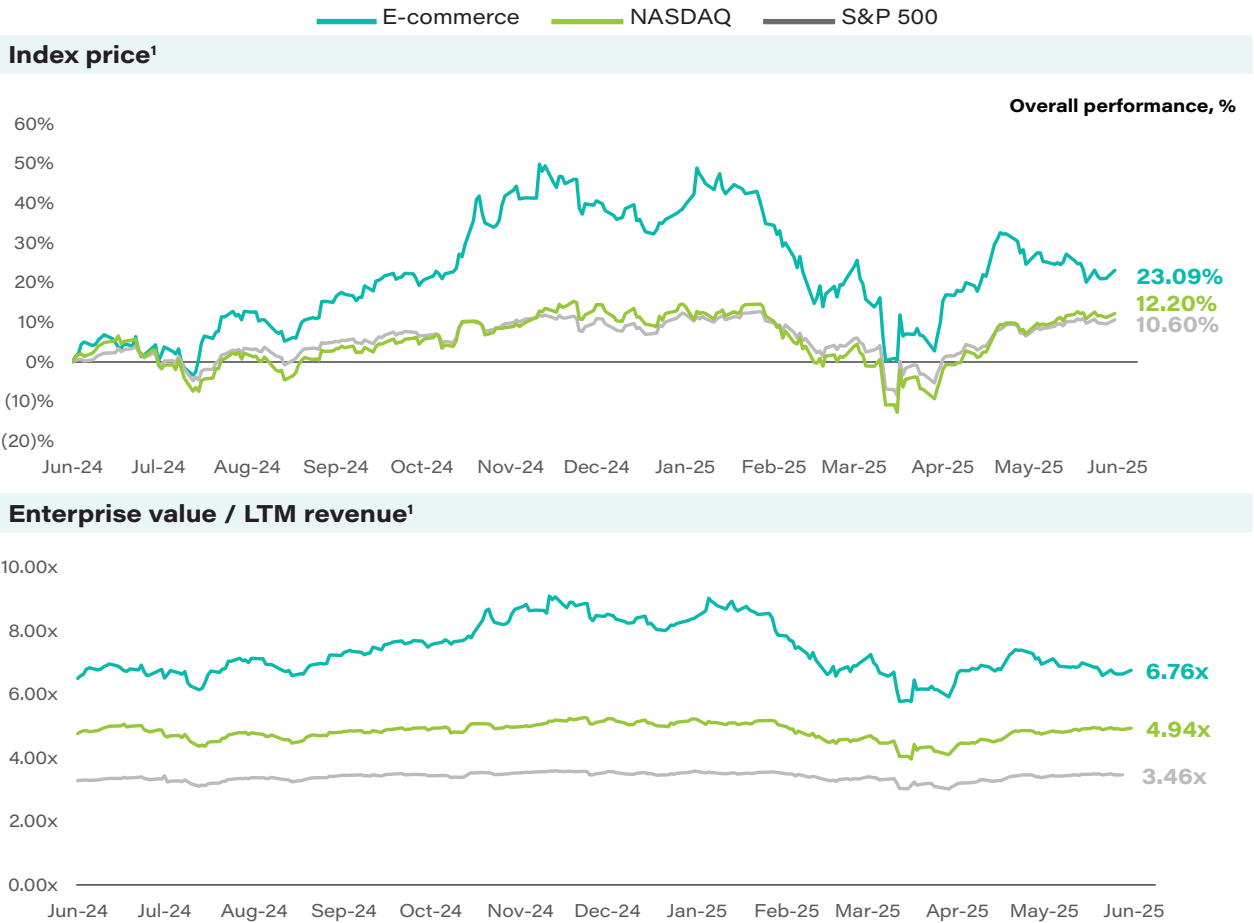
(\$ in millions)		Revenue growth		LTM gross margin	LTM EBITDA margin	Enterprise value /			
Company	LTM revenue	2024A - 2025E	2025E - 2026E			Revenue		EBITDA¹	
						2025E	2026E	2025E	2026E
Amplitude (AMPL)	\$306.6	10.6%	10.8%	74.5%	(33.6%)	3.83x	3.46x	NMF	69.9x
Bandwidth (BAND)	\$751.7	0.4%	13.5%	38.0%	4.0%	1.14x	1.00x	9.7x	7.5x
BigCommerce (BIGC)	\$334.9	3.0%	5.1%	77.3%	(1.3%)	1.26x	1.20x	14.3x	11.7x
Braze (BRZE)	\$620.0	18.7%	16.9%	69.4%	(18.6%)	3.45x	2.95x	NMF	50.1x
Cardlytics (CDLX)	\$272.6	(2.8%)	6.1%	42.2%	(14.7%)	0.95x	0.89x	NMF	28.5x
Five9 (FIVN)	\$1,074.6	9.6%	9.8%	54.7%	3.8%	1.94x	1.77x	9.3x	7.9x
HubSpot (HUBS)	\$2,724.3	15.9%	15.9%	84.8%	(1.7%)	8.84x	7.63x	40.5x	33.9x
Klaviyo (KVYO)	\$1,007.3	25.3%	21.0%	75.8%	(7.2%)	6.96x	5.75x	52.3x	39.1x
LivePerson (LPSN)	\$292.0	(22.6%)	0.8%	70.2%	(5.8%)	1.76x	1.74x	NMF	NMF
LiveRamp Holdings (RAMP)	\$745.6	8.2%	8.9%	71.0%	4.1%	2.10x	1.93x	10.2x	8.5x
MercadoLibre (MELI)	\$22,379.0	31.6%	23.9%	52.2%	15.8%	4.54x	3.66x	28.3x	21.6x
RingCentral (RNG)	\$2,428.2	4.8%	5.7%	70.6%	10.7%	1.53x	1.45x	6.0x	5.5x
Salesforce (CRM)	\$38,591.0	8.8%	9.0%	77.3%	29.0%	5.98x	5.48x	15.3x	13.9x
Shopify (SHOP)	\$9,379.0	22.5%	20.5%	49.9%	15.2%	12.63x	10.48x	73.7x	55.5x
Sprinklr (CXM)	\$805.9	3.7%	4.8%	71.1%	5.1%	1.92x	1.83x	10.0x	10.6x
SPS Commerce (SPSC)	\$669.7	19.3%	12.8%	67.7%	21.8%	6.71x	5.95x	22.1x	19.1x
The Trade Desk (TTD)	\$2,569.6	16.9%	18.2%	80.1%	20.5%	11.35x	9.60x	28.9x	23.8x
Twilio (TWLO)	\$4,583.4	8.4%	7.6%	50.6%	5.0%	3.44x	3.20x	17.1x	15.0x
VTEX (VTEX)	\$228.2	9.7%	16.0%	74.7%	6.4%	3.95x	3.41x	41.8x	27.8x
Weave Communications (WEAV)	\$213.0	16.3%	15.7%	71.8%	(10.6%)	2.40x	2.07x	NMF	44.6x
Wix.com (WIX)	\$1,814.5	12.8%	12.9%	68.1%	8.7%	4.41x	3.91x	18.1x	14.4x
Yext (YEXT)	\$434.5	6.8%	5.1%	76.5%	5.9%	2.18x	2.07x	9.4x	8.0x
Average	\$4,192.1	10.4%	11.9%	66.8%	2.8%	4.24x	3.70x	23.9x	24.6x
Median	\$778.8	9.7%	11.8%	70.8%	4.6%	3.45x	3.08x	17.1x	19.1x

Source: Capital IQ, First Analysis.

Notes: * Public comparable company data shown above is as of June 23, 2025.

(1) EBITDA multiples less than 0 and greater than 75 labeled "not meaningful" (NMF). LTM = last 12 months. EBITDA = earnings before interest, taxes, depreciation and amortization.

First Analysis E-commerce Optimization Index 1-year performance



Source: Capital IQ.

Notes: (1) Index performance is weighted by market cap. For the period from June 24, 2024, through June 23, 2025.

index's gain. The shares of 12 companies declined, with Cardlytics (CDLX) declining the most at 79%.

The index's enterprise value multiple of trailing 12-month revenue ended the period at 6.8, down from a peak of 9.1 in December. For forward multiples, the

average enterprise value multiple of 2025 estimated revenue was 4.2 as of June 23, and for 2026, it was 3.7. Revenue was expected to grow by 10.4% in 2025 and by 11.9% in 2026; in our early December 2024 report, revenue was expected to grow by 11.5% on average in 2025.

E-commerce M&A: Notable transactions include mParticle, Appriss Retail and OfferFit

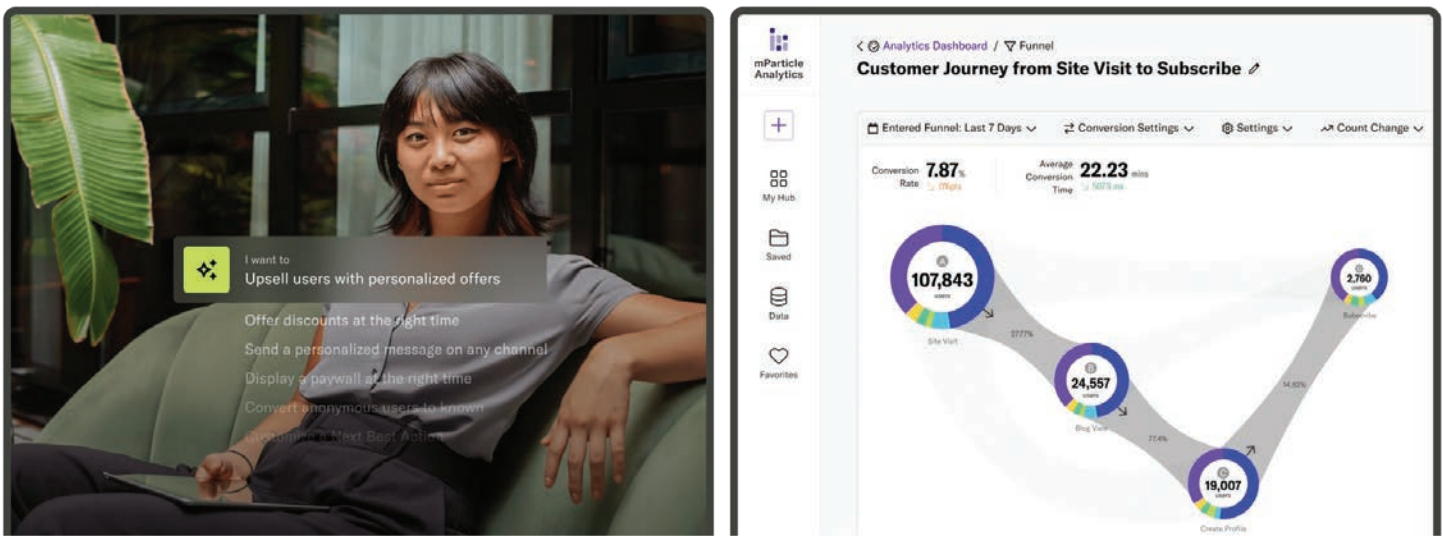
We highlight four notable acquisitions since our last report.

In mid-January, Rokt, which provides e-commerce software to boost customer engagement and maximize revenue, acquired mParticle for \$300 million in a transaction structured as a merger. mParticle helps consumer brands unify and use their customer data in real time to deliver personalized experiences across channels. With this merger, Rokt gains access to mParticle's real-time customer data, enhancing its ability to de-

liver highly personalized, relevant offers and seamless experiences at key moments such as checkout. It also enables Rokt to help brands improve performance while maintaining full control over their first-party data and compliance.

On March 12, Appriss Retail, one of the companies featured in our discussion of e-commerce return prevention technology, announced Gemspring Capital had acquired the company for an undisclosed amount. We think the transaction underscores investors' increasing appreciation

mParticle platform



Source: mParticle.

The Appriss Linking System links purchases, returns, orders, claims, appeasements, credit cards and more to create a consistent view of shopper behavior

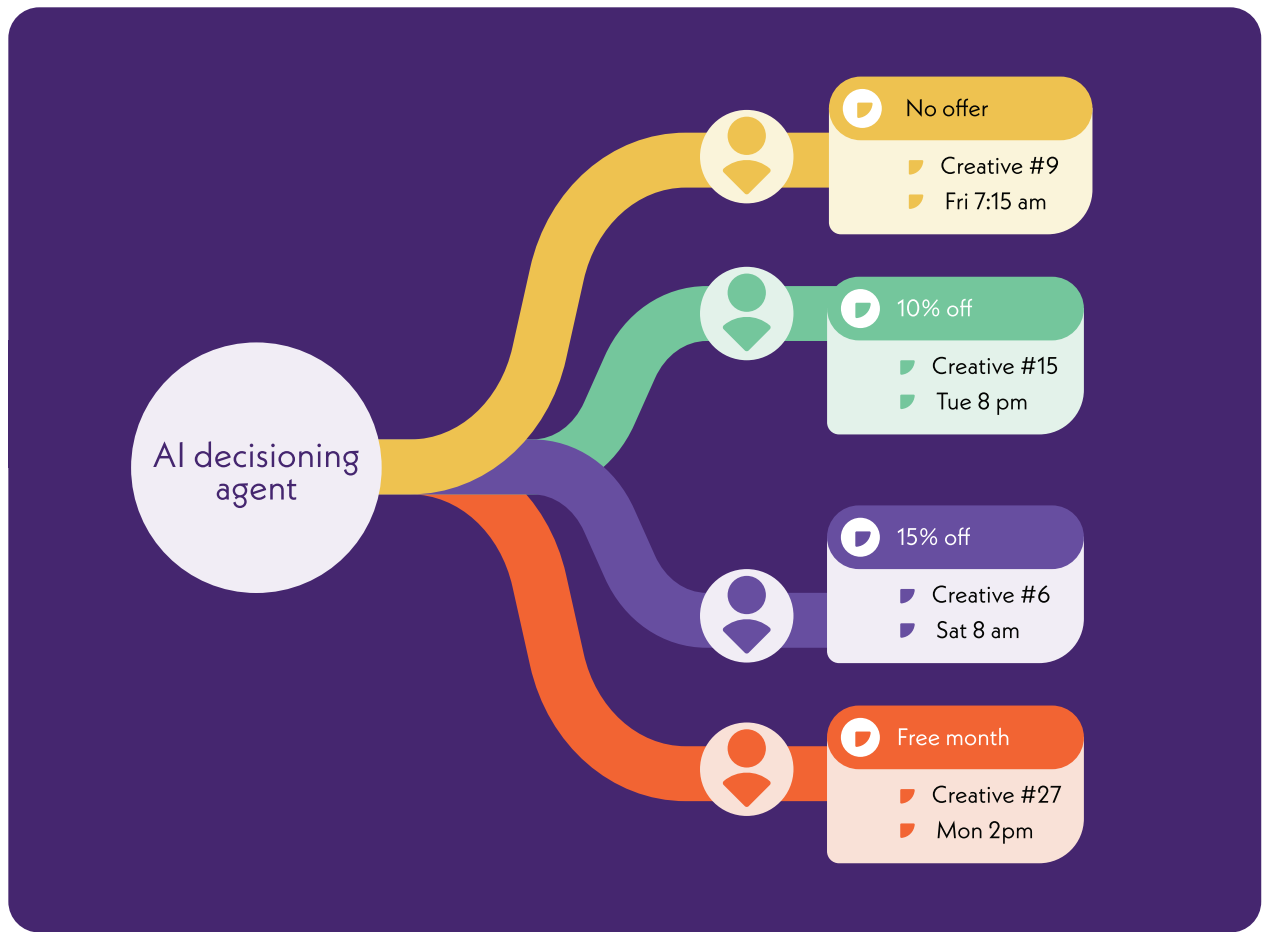


Source: Appriss Retail.

of the value of return prevention technology. As noted, Appriss's omnichannel solution uncovers sales-reducing activities like organized retail crime, employee theft and abusive returns, enabling retailers to combat these problems while ensuring positive experiences for legitimate customers.

On March 27, Braze (BRZE), a customer engagement platform, announced it would acquire marketing automation platform OfferFit for \$325 million in cash and stock. OfferFit uses artificial intelligence (AI) to automate personalized marketing, removing the need for manual A/B testing and segmentation. It uses reinforcement learning to tailor messages across channels, boosting engagement and conversions. The acquisition strengthens

OfferFit's AI decisioning agent finds the best actions for each individual and continuously learns from customer behavior



Source: OfferFit.

Braze's focus on agentic AI and accelerating its Project Catalyst, an AI effort focused on building intelligent agents that personalize and optimize customer experiences in real time. For OfferFit,

the acquisition supports rapid expansion by tapping into Braze's customer base, improving integration of its AI technology and accelerating solution deployment.

Select recent M&A transactions (sorted by date of announcement)

(\$ in millions)					
Date	Target	Target business description	Buyer	Enterprise value (EV)	EV/ Revenue
05/27/2025	Khoros	Customer engagement software for managing digital contact centers, social channels and branded communities	IgniteTech	Undisclosed	Undisclosed
05/20/2025	Full Circle Insights	Marketing performance management tool built for Salesforce users to measure campaign return on investment and funnel impact	Conquer	Undisclosed	Undisclosed
05/14/2025	InMoment	Customer experience platform focused on feedback collection, analytics and decision support across multiple channels	Press Ganey Forsta	Undisclosed	Undisclosed
05/07/2025	Prive Technologies	Subscription commerce platform with tools for pricing, churn prevention and revenue optimization	Recurly	Undisclosed	Undisclosed
05/05/2025	TrueLark	AI-powered virtual receptionist that handles scheduling, rescheduling, and responding to messages through SMS and web chat	Weave (WEAV)	\$35.0	Undisclosed
05/01/2025	Wynshop	E-commerce platform tailored to grocery and local retailers, supporting digital storefronts and fulfillment	Instacart (CART)	\$105.0	Undisclosed
04/29/2025	ImprezzAI	AI-driven ad tech solution offering programmatic campaign management and performance optimization	TireTutor	Undisclosed	Undisclosed
04/16/2025	Touchcast	Virtual experience company with tools for digital avatars, conversational websites and AI-powered collaboration	Infinite Reality	\$500.0	Undisclosed
04/10/2025	Litmus	Email testing and analytics platform used to optimize message deliverability, rendering and engagement	Validity	Undisclosed	Undisclosed
03/27/2025	OfferFit	Omnichannel marketing engine that automates offer personalization using reinforcement learning	Braze (BRZE)	\$325.0	Undisclosed
03/14/2025	Vantage Discovery	Personalized search and content discovery engine powered by large language models	Shopify (SHOP)	\$59.0	Undisclosed
03/13/2025	Velvet	Customer onboarding and payments platform for startups managing recurring revenue and user engagement	Arize AI	Undisclosed	Undisclosed
03/12/2025	Appriss Retail	Retail fraud prevention platform offering risk, engagement and incident management tools	Gemspring Capital	Undisclosed	Undisclosed
03/04/2025	LyveCom	Live video commerce platform supporting real-time product showcases and transactions	Verb Technology (VERB)	\$8.2	Undisclosed
02/27/2025	mademebuyit	Business-to-business wholesale marketplace connecting e-commerce brands with retailers for inventory purchasing	Wayflyer	Undisclosed	Undisclosed
02/18/2025	Powerconnect.AI	AI customer experience platform focused on automating support and improving response quality	BHC Global	Undisclosed	Undisclosed
02/10/2025	Places Scout	Local search engine optimization and visibility toolset offering audits, rank tracking, reputation monitoring and lead generation	Yext (YEXT)	\$20.3	Undisclosed
02/03/2025	DataTrans Solutions	Electronic data interchange and fulfillment automation platform for supply chain, logistics and e-commerce integration	Cleo Communications	Undisclosed	Undisclosed
01/23/2025	Act-On Software	Marketing software for automation, lead generation, analytics and campaign management for small and medium-size businesses	Banzai International (BNZI)	\$53.2	1.97x

Select recent M&A transactions (sorted by date of announcement)

(\$ in millions)

Date	Target	Target business description	Buyer	Enterprise value (EV)	EV/ Revenue
01/17/2025	Cuein	Customer experience observability platform for analyzing chatbot, voice flow and agent performance	ServiceNow (NOW)	Undisclosed	Undisclosed
01/16/2025	mParticle	Helps consumer brands unify and use their customer data in real time to deliver personalized experiences across channels	Rokt	\$300.0	Undisclosed
01/15/2025	Sincera Technologies	Metadata intelligence platform for digital marketers focusing on targeting, compliance and analysis	The Trade Desk (TTD)	Undisclosed	Undisclosed
01/15/2025	Rocketprint Software	Web-to-print e-commerce platform for managing print orders and storefronts online	Bristol Pay	Undisclosed	Undisclosed
01/10/2025	Newtail	Supermarket digitization platform enabling on-line orders, payments and logistics integration	VTEX (VTEX)	\$4.1	Undisclosed
01/02/2025	Carbon6 Technologies	Product optimization and business scaling software for Amazon sellers	SPS Commerce (SPSC)	\$210.0	5.25x

Source: Capital IQ, First Analysis.

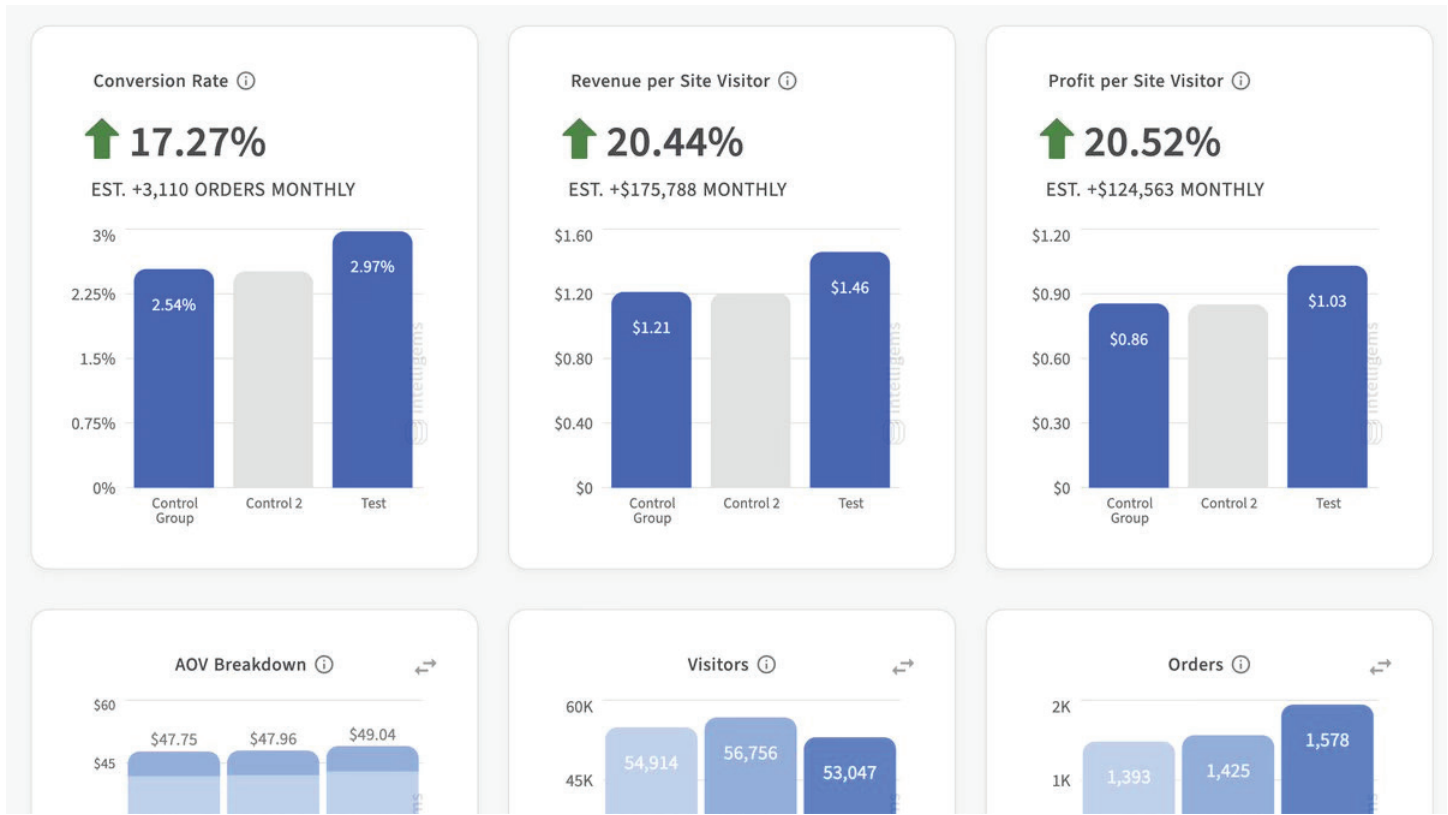
E-commerce private placements: Notable transactions include Intelligems, Gierd, VOC.AI and Cart.com

We highlight several noteworthy e-commerce private placements since our last report.

In March, Intelligems announced it raised \$9 million in a Series A round led by Stage 2 Capital. Intelligems helps e-commerce brands maximize profit by using data-driven testing and personalization

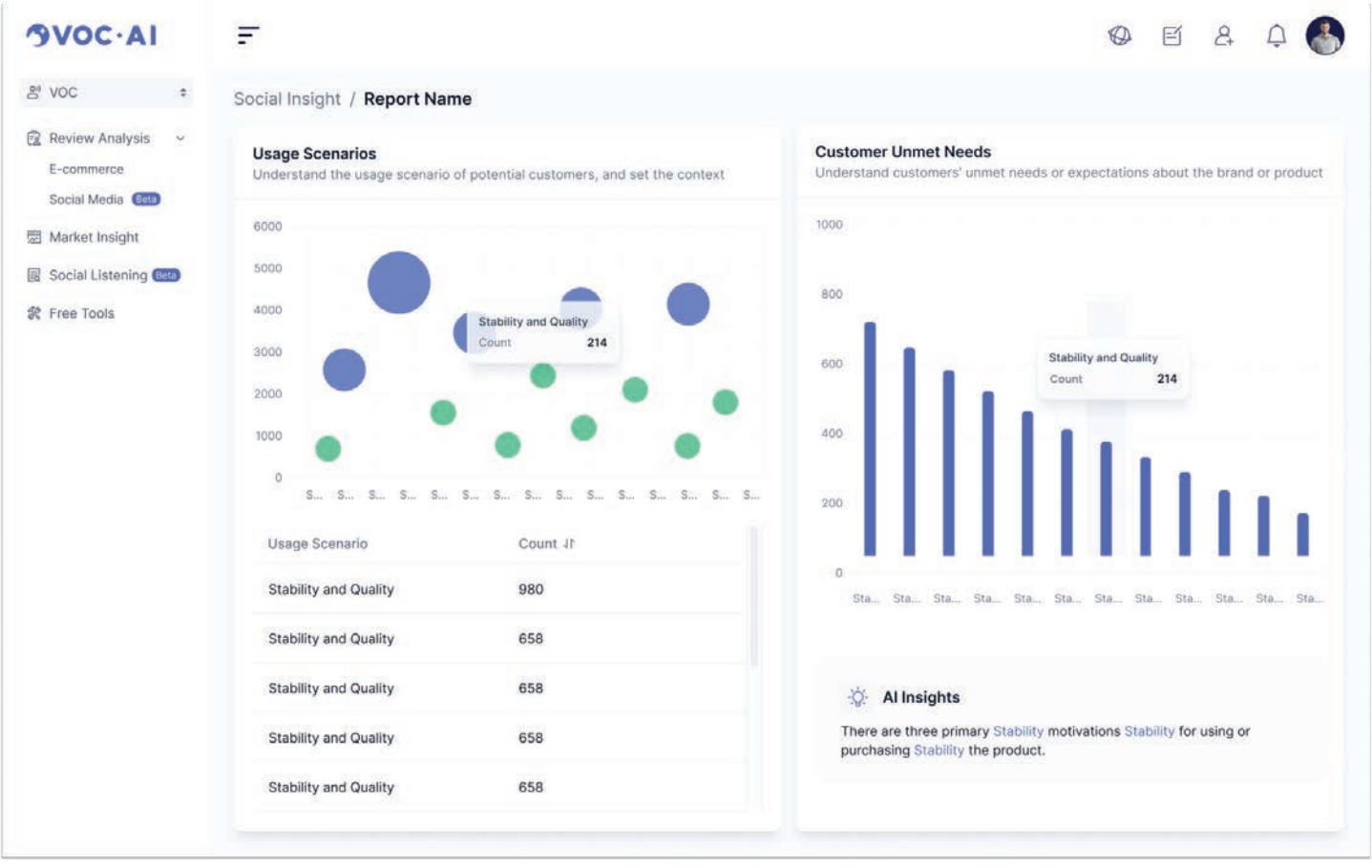
for pricing, discounts, shipping and site experiences. With the investment, Intelligems will accelerate product development focused on dynamic pricing, profit-driven A/B testing, and personalized offers and shipping options. It will also invest in enhancing its analytics capabilities and growing its team to better support e-commerce brands at scale.

Intelligems monitors visitor behavior delivering the insights brands need to optimize conversion and revenue



Source: Intelligems.

VOC.AI analytics and market insights dashboard



Source: VOC.AI.

At the end of March, Gierd announced an \$8 million Series A funding round led by Nyca Partners, with participation from Fortson VC and Kick Start. Gierd provides software for enterprise brands to streamline and automate their operations across major online marketplaces like Amazon, eBay and Walmart. The rise of marketplace commerce is driving enterprise brands to find smarter ways to manage and scale their marketplace operations, creating a strong opportunity for Gierd to deliver AI-powered automation and real-time insights. The funding will help Gierd enhance its platform with

AI-driven tools and deeper integrations, enabling brands to operate more efficiently and increase their marketplace sales.

In April, VOC.AI announced a \$15 million funding led by Shanda Grab Ventures with participation from Northern Light Venture Capital and Starting Gate Fund. VOC.AI provides AI-powered customer service solutions that help e-commerce brands automate support tasks and improve efficiency. Funds will be used to advance VOC.AI's AI agent technology and expand globally.

Fulfillment and logistics capabilities must embrace new technology, data analytics and automation



Source: Cart.com

On May 12, Cart.com announced it had raised \$50 million with a post-money valuation of \$1.6 billion, bringing its total funding to \$475 million since inception. Investors in the round included Black-Rock, Neuberger Berman, and new investor eGateway Capital. Cart.com provides unified e-commerce and logistics solutions that help merchants sell and fulfill across multiple channels. This funding follows Cart.com's acquisitions of OceanX and Amify, which helped strengthen its fulfillment capabilities and enhance its Amazon marketplace optimization and advertising services. The funding will be used for investments in infrastructure, technology, and further acquisitions.

Select recent private placements (sorted by date of announcement)

(\$ in millions)

Date	Company	Business description	Investors	Raise type	Amount raised	Total amount raised
06/24/2025	Superfiliate	Affiliate marketing platform enabling brands to launch influencer, referral and loyalty programs	Undisclosed	Venture	\$2.0	\$5.5
06/12/2025	Landbase	Lead generation and outbound platform offering automation, audience tracking and LinkedIn personalization	8VC; A-Star Partners; Firstminute Capital; Picus Capital; Sound Ventures; The General Partnership	Series A	\$30.0	Undisclosed
06/03/2025	Krepling	Subscription commerce platform supporting centralized operations with tools for site building, inventory and staff management	FJ Labs	Seed	Undisclosed	Undisclosed
05/21/2025	Chemistry Communications	Full-service agency offering cross-channel media, branding, digital strategy and creative for business-to-business and consumer brands	Breakwater Management	Growth	Undisclosed	Undisclosed
04/29/2025	VOC.AI	AI-powered customer service solutions that help e-commerce brands automate support tasks and improve efficiency	Northern Light Venture Capital; Shanda Grab Ventures; Starting Gate Fund	Venture	\$15.0	\$15.0
04/29/2025	Optiversal	AI content generation platform enabling large retailers to create search engine optimization friendly pages, blogs and product content at scale	Data Point Capital	Series A	\$5.6	\$9.8
04/10/2025	Cart.com	Provides unified e-commerce and logistics solutions that help merchants sell and fulfill across multiple channels	BlackRock; Neuberger Berman Group; eGateway Capital	Series C	\$50.0	\$475.0
03/31/2025	Gierd	E-commerce orchestration suite providing tools for fraud detection, pricing optimization and reconciliation automation	Kick Start; Nyca Partners; Fortson VC	Series A	\$8.0	\$8.0
03/27/2025	Ekyam	Integration layer for retailers to sync data across enterprise resource planning systems, order management systems, point-of-sale systems and e-commerce platforms using AI middleware	Female Founders Fund	Pre-Seed	\$2.0	\$2.0
03/21/2025	SmartCommerce	Click-to-cart platform optimizing the product path-to-purchase for consumer packaged goods brands across retail partners	The Argentum Group, First Analysis	Growth	\$3.5	\$27.8
03/13/2025	Intelligems	Helps e-commerce brands maximize profit by using data-driven testing and personalization for pricing, discounts, shipping and site experiences	Techstars Central; Hyde Park Angels; Matchstick Ventures; Vinyl Capital; Stage 2 Capital; Hawke Ventures; SuperAngel.vc; Frazier Group	Series A	\$9.0	\$22.1
03/11/2025	OrderPort	Winery management software offering point-of-sale, club management, customer relationship management and e-commerce in a unified system	Performant Capital	Undisclosed	Undisclosed	Undisclosed
03/04/2025	Copley Software	AI content platform for commerce teams to create, analyze and deploy multi-channel marketing and ad content	Underscore.VC; Asymmetric Capital Partners	Pre-Seed	\$4.8	\$4.8

Select recent private placements (sorted by date of announcement)

(\$ in millions)

Date	Company	Business description	Investors	Raise type	Amount raised	Total amount raised
01/31/2025	Gravitiq	Healthcare-focused e-commerce aggregator acquiring and scaling wellness and baby care brands on Amazon	Capital Southwest Corporation	Undisclosed	Undisclosed	Undisclosed
01/23/2025	Orbee	Automotive marketing platform offering campaign analytics, customer relationship management software integration and website personalization	Butler Automotive Group; Sam Pack Automotive Group	Growth	Undisclosed	Undisclosed
01/23/2025	Lebesgue	Ad performance and customer insights platform offering retention tracking and revenue forecasting	Fil Rouge Capital; Inter-active Venture Partners; Bridge Venture Fund; K20 Fund	Seed	\$3.0	\$3.0
01/22/2025	iDrive Logistics	E-commerce fulfillment and logistics platform optimizing small parcel shipping for brands and third-party logistics providers	Decathlon Capital Partners	Debt	Undisclosed	Undisclosed
01/16/2025	Reshop	Software to help retailers automate and improve refund processes by analyzing order data and shopper behavior	Touch Ventures (TVL); Matrix Partners; Sound Ventures	Growth	\$17.0	Undisclosed
01/10/2025	Pipe17	Commerce connectivity platform automating inventory and order flows across e-commerce and enterprise resource planning systems	Glp Capital Partners; LFX Venture Partners	Series A	\$16.9	Undisclosed
01/02/2025	Rembrand	AI-driven product placement tool embedding photorealistic items into video content for brand promotion	Greycroft LP; The Trade Desk (TTD); Naver D2SF; Omega Venture Partners; BOLD; L'Oréal	Series A	\$23.0	\$32.0
01/01/2025	Ikas	E-commerce platform for managing pricing, currencies, and multichannel operations from a single dashboard	FJ Labs	Series B	Undisclosed	Undisclosed

Source: Capital IQ, First Analysis.

E-commerce optimization public comparables appendix*

(\$ in millions)

(\$ in millions)				Revenue growth		LTM gross margin	LTM EBITDA margin	Enterprise value /			
Company	Market cap	Enterprise value	LTM revenue	2024A - 2025E	2025E - 2026E			Revenue		EBITDA¹	
								2025E	2026E	2025E	2026E
Amplitude (AMPL)	\$1,545.8	\$1,268.1	\$306.6	10.6%	10.8%	74.5%	(33.6%)	3.83x	3.46x	NMF	69.9x
Bandwidth (BAND)	\$418.5	\$856.0	\$751.7	0.4%	13.5%	38.0%	4.0%	1.14x	1.00x	9.7x	7.5x
BigCommerce (BIGC)	\$386.9	\$433.0	\$334.9	3.0%	5.1%	77.3%	(1.3%)	1.26x	1.20x	14.3x	11.7x
Braze (BRZE)	\$2,884.3	\$2,432.4	\$620.0	18.7%	16.9%	69.4%	(18.6%)	3.45x	2.95x	NMF	50.1x
Cardlytics (CDLX)	\$87.2	\$255.8	\$272.6	(2.8%)	6.1%	42.2%	(14.7%)	0.95x	0.89x	NMF	28.5x
Five9 (FIVN)	\$2,025.0	\$2,217.6	\$1,074.6	9.6%	9.8%	54.7%	3.8%	1.94x	1.77x	9.3x	7.9x
HubSpot (HUBS)	\$28,294.2	\$26,906.6	\$2,724.3	15.9%	15.9%	84.8%	(1.7%)	8.84x	7.63x	40.5x	33.9x
Klaviyo (KVYO)	\$8,961.7	\$8,176.0	\$1,007.3	25.3%	21.0%	75.8%	(7.2%)	6.96x	5.75x	52.3x	39.1x
LivePerson (LPSN)	\$72.3	\$424.9	\$292.0	(22.6%)	0.8%	70.2%	(5.8%)	1.76x	1.74x	NMF	NMF
LiveRamp Holdings (RAMP)	\$2,038.1	\$1,653.6	\$745.6	8.2%	8.9%	71.0%	4.1%	2.10x	1.93x	10.2x	8.5x
MercadoLibre (MELI)	\$124,355.1	\$124,043.1	\$22,379.0	31.6%	23.9%	52.2%	15.8%	4.54x	3.66x	28.3x	21.6x
RingCentral (RNG)	\$2,387.8	\$3,841.8	\$2,428.2	4.8%	5.7%	70.6%	10.7%	1.53x	1.45x	6.0x	5.5x
Salesforce (CRM)	\$251,820.0	\$246,432.0	\$38,591.0	8.8%	9.0%	77.3%	29.0%	5.98x	5.48x	15.3x	13.9x
Shopify (SHOP)	\$142,685.9	\$137,415.9	\$9,379.0	22.5%	20.5%	49.9%	15.2%	12.63x	10.48x	73.7x	55.5x
Sprinklr (CXM)	\$2,101.8	\$1,582.4	\$805.9	3.7%	4.8%	71.1%	5.1%	1.92x	1.83x	10.0x	10.6x
SPS Commerce (SPSC)	\$5,189.6	\$5,107.0	\$669.7	19.3%	12.8%	67.7%	21.8%	6.71x	5.95x	22.1x	19.1x
The Trade Desk (TTD)	\$33,854.4	\$32,449.0	\$2,569.6	16.9%	18.2%	80.1%	20.5%	11.35x	9.60x	28.9x	23.8x
Twilio (TWLO)	\$17,978.9	\$16,631.8	\$4,583.4	8.4%	7.6%	50.6%	5.0%	3.44x	3.20x	17.1x	15.0x
VTEX (VTEX)	\$1,185.1	\$983.0	\$228.2	9.7%	16.0%	74.7%	6.4%	3.95x	3.41x	41.8x	27.8x
Weave Communications (WEAV)	\$613.5	\$570.7	\$213.0	16.3%	15.7%	71.8%	(10.6%)	2.40x	2.07x	NMF	44.6x
Wix.com (WIX)	\$8,870.9	\$8,757.2	\$1,814.5	12.8%	12.9%	68.1%	8.7%	4.41x	3.91x	18.1x	14.4x
Yext (YEXT)	\$1,001.2	\$979.0	\$434.5	6.8%	5.1%	76.5%	5.9%	2.18x	2.07x	9.4x	8.0x
Average	\$29,034.5	\$28,337.1	\$4,192.1	10.4%	11.9%	66.8%	2.8%	4.24x	3.70x	23.9x	24.6x
Median	\$2,244.8	\$2,325.0	\$778.8	9.7%	11.8%	70.8%	4.6%	3.45x	3.08x	17.1x	19.1x

Source: Capital IQ.

Notes: * Public comparable company data shown above is as of June 23, 2025.

(1) EBITDA multiples less than 0 and greater than 75 labeled "not meaningful" (NMF). LTM = last 12 months. EBITDA = earnings before interest, taxes, depreciation and amortization.

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