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## EMERGING TECH RESEARCH

# Generative AI in E-Commerce

Assessing the impact, opportunities, and challenges presented by generative AI startups in online transactions

PitchBook is a Morningstar company providing the most comprehensive, most accurate, and hard-to-find data for professionals doing business in the private markets.

## Key takeaways

- Venture funding for generative AI startups has grown significantly since 2019, when \$1.9 billion was invested across 105 deals, to \$12.7 billion through Q1 2023. Startups within the e-commerce enablement segment have followed a similar upward trajectory and raised approximately \$1.3 billion in 2023.
- Customer service & contact center technologies lead all categories in funding by a healthy margin, attracting approximately \$1.1 billion in venture capital to date. Conversational commerce applications posted the second-highest total at \$903.1 million, followed by AI-core services at \$897.7 million.
- Generative AI's impact on the e-commerce ecosystem is likely to materialize ahead of its influence on other sectors such as financial services, healthcare, or supply chain. Among other factors, this is driven by less regulatory oversight and e-commerce's razor-thin margins that encourage innovation and experimentation. E-commerce merchants also sit on troves of first-party data from a growing number of online transactions.
- The long-term defensibility of most generative AI startups is highly unsettled, particularly in commerce applications, and many incumbents have a "right of first refusal."
- The most disruptive paradigm shift we see is the adoption of individualized, autonomous shopping assistants. These agents could research and transact on behalf of a consumer while offering an alternative to websites and checkout funnels that have been largely unchanged. Due to myriad technical and UX challenges, this category is nascent.

## Background

The introduction of ChatGPT initiated a frenzy of activity, both within the technology and investment communities and within the broader social zeitgeist, as the world recognized that rapidly improving large language models (LLMs) and AI capabilities will have a wide-ranging impact. Although the use of AI in e-commerce operations is not new—merchants have long benefited from product recommendations, targeted advertising, customer support automation, and more—the widespread accessibility and performance of LLMs are pushing the e-commerce industry to grapple with their disruptive potential.

E-commerce stakeholders have many reasons to be bullish. In the long term, e-commerce's share of retail transactions will continue to grow as emerging markets embrace online transactions and B2B merchants digitize their operations. Merchants will be able to streamline customer support, accelerate product design, and move from personalization toward individualization. Additionally, the cost of creating a digital presence is trending toward absolute zero. Though the barrier to entry for an e-commerce operation has already been drastically reduced by platforms such as Shopify and freelance services on Fiverr, the barrier may soon be reduced to a single prompt. Similarly, consumers will benefit from “n-of-1” shopping flows designed for their individual needs, while popular prompts—such as creating a vacation itinerary or recipes for a dinner party—will become purchases on Kayak or Instacart.

Despite this optimism, headwinds exist. Legal and regulatory concerns are percolating as lawsuits examining intellectual property and copyright risk remain unsettled. Uncertainty about the long-term differentiation of these services and the durability of competitive moats also exists. Geopolitical trends must also be considered after the EU and China introduced legislation to improve AI transparency and Italy banned ChatGPT in April 2023 over privacy concerns (though the ban was later lifted). The ecosystem may also necessitate a rethinking of user-experience paradigms to fit AI-first services.

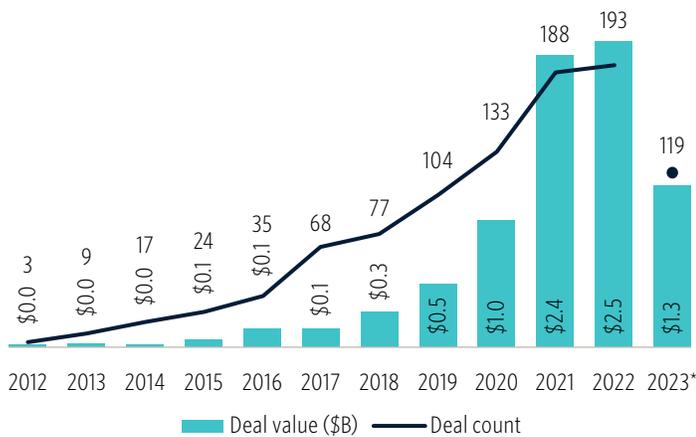
## VC activity

Our [Q1 2023 Artificial Intelligence & Machine Learning Report](#) tracked \$12.7 billion in deal value for generative AI through Q1 2023. VC investment into generative AI tools with e-commerce applications has increased healthily over the previous six years, jumping from \$277.3 million in 2018 to \$2.5 billion in 2022. Customer service & contact center technologies lead all categories in funding by a healthy margin, attracting approximately \$1.1 billion in venture capital thus far. Conversational commerce applications posted the second-highest total at \$903.1 million, followed by AI-core services at \$897.7 million.

*Notable deals in this segment include:*

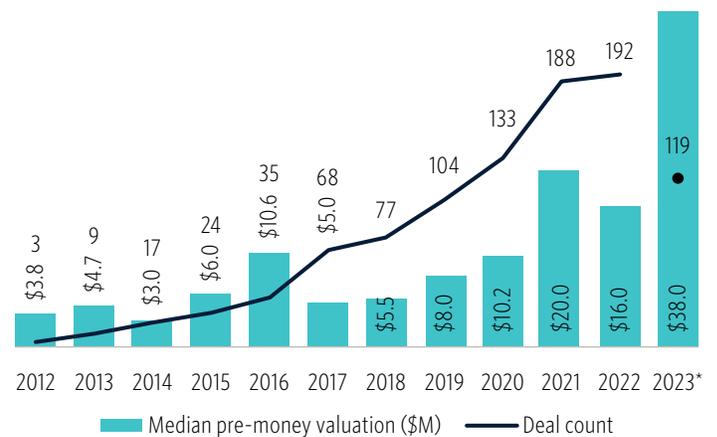
- **GupShup**, a conversational commerce platform, raised a \$340.0 million late-stage deal in April 2022, bringing the company’s total raised to \$386.4 million at a \$1.5 billion valuation.
- **Scale AI**, a platform for data labeling, synthetic data, and enterprise application development, raised a \$325.0 million late-stage round in April 2023 at a \$7.5 billion valuation.
- **Builder**, an AI-powered application development service, raised a \$250.0 million Series D in May 2023. Merchants using Builder can build or customize apps for inventory management, order management, billing software, and more. The company has raised \$445.0 million at a \$553.0 million valuation.

### Generative AI e-commerce VC deal activity



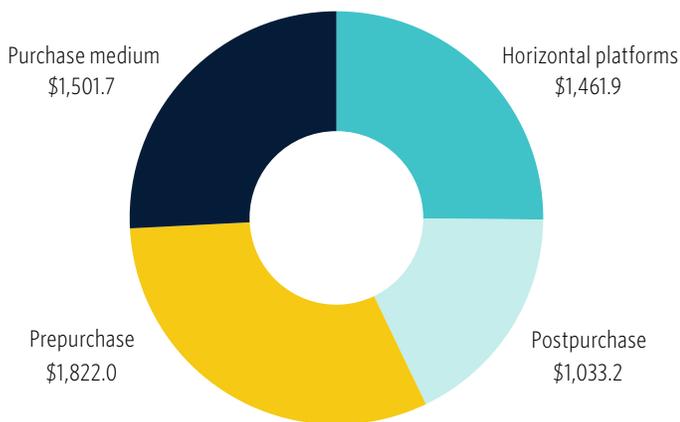
Source: PitchBook • Geography: Global  
\*As of August 18, 2023

### Generative AI e-commerce median pre-money valuation and deal count



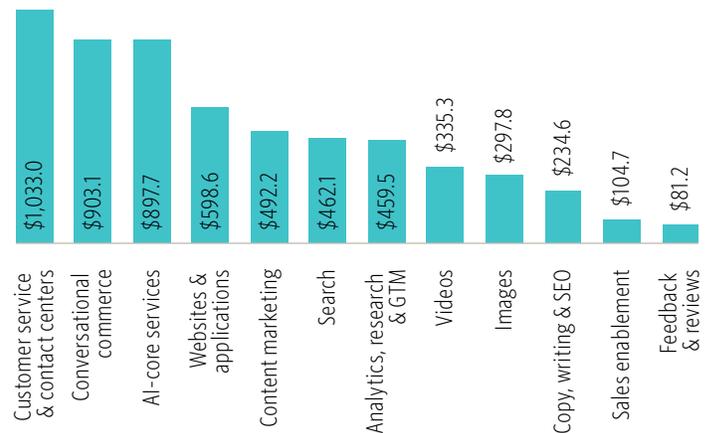
Source: PitchBook • Geography: Global  
\*As of August 18, 2023

### Share of generative AI e-commerce VC deal value (\$M) by segment\*



Source: PitchBook • Geography: Global  
\*As of August 18, 2023

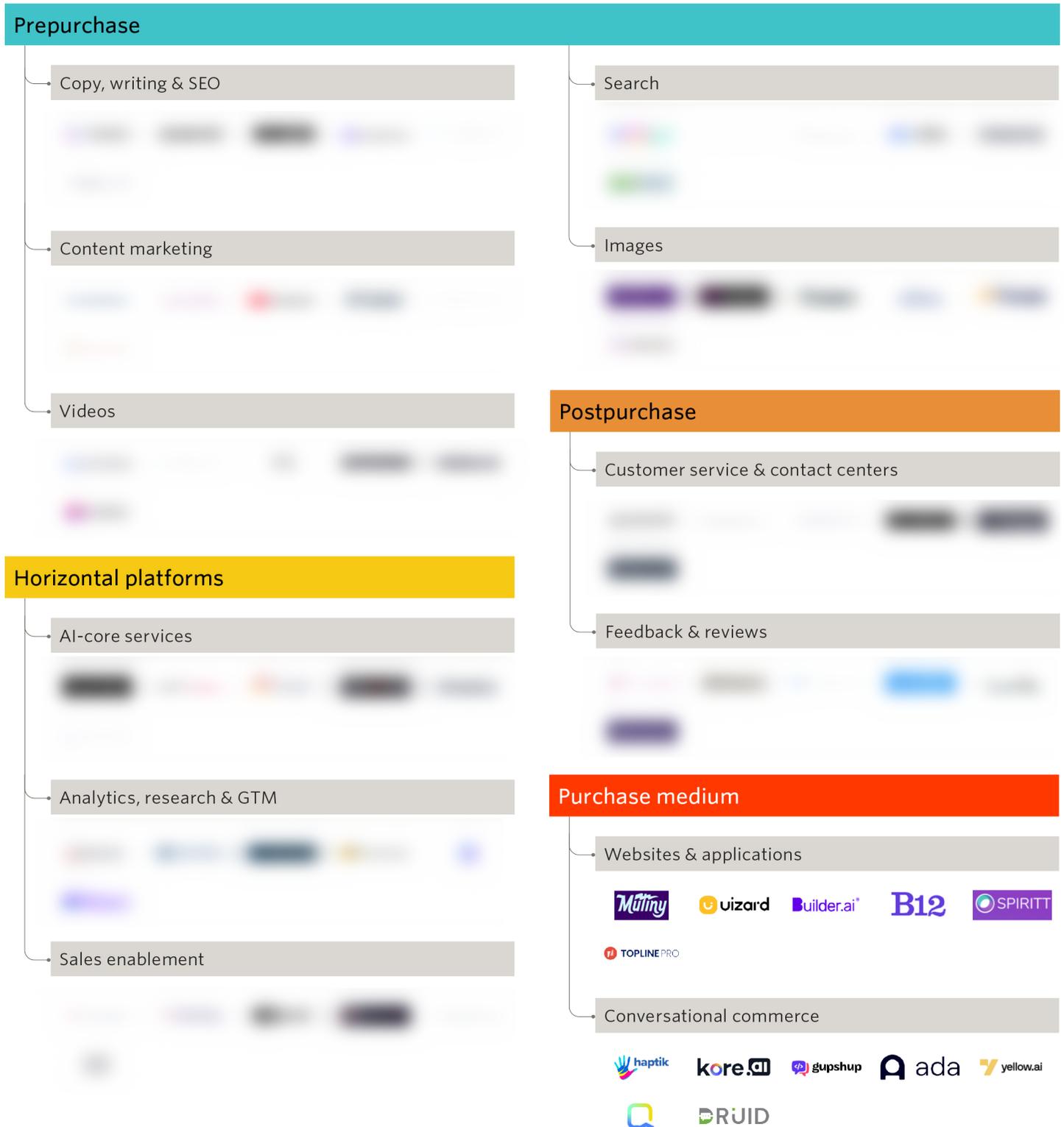
### Generative AI e-commerce VC deal value (\$M) by subsegment\*



Source: PitchBook • Geography: Global  
\*As of August 18, 2023

## Generative AI e-commerce VC ecosystem market map

Market map is a representative overview of venture-backed or growth-stage providers in each segment. Companies listed have received venture capital or other notable private investments.



## Prepurchase

### Overview

Startups within the prepurchase segment help shoppers discover relevant products across shopping channels. For generative AI platforms, this segment includes search providers, image and text generation platforms, and content marketing services. This segment is data driven and intensely competitive as startups compete with the enormous data graphs, network effects, and capital of incumbents such as Google, Amazon, and OpenAI. Merchants continue to grapple with rising customer acquisition costs, privacy changes, and shrinking margins, all of which have the potential to be impacted by generative AI. In the near term, marketing and content generation are top use cases for merchants to improve product discovery, conversion, and personalization.<sup>1</sup> In the long term, we expect to see the acceleration of B2B adoption and the emergence of individualized shopping experiences.

The prepurchase segment contains the following categories:

**Content marketing:** Startups that support the operations of content creation, incorporate analytics, or provide modality-agnostic content across a variety of distribution channels.

**Images:** Pretrained models and applications that create images based on user prompts.

**Videos:** Platforms that create videos, which can be personalized based upon user inputs.

**Copy, writing & search engine optimization (SEO):** Services that generate text or copy for users' search engines, or other aggregators, to improve product discovery.

**Search:** Components that plug into a website, operate as standalone platforms, or ingest internal content to accelerate product discovery.

### Opportunities

**Targeted product discovery:** Search experiences remain largely broken. Conversion rates are stuck in the low single digits and more than 70% of the top 200 e-commerce websites require exact terminology to be used in the search bar for the search to work.<sup>2,3</sup> Near-term disruption in search will most likely benefit medium to large retailers that have sufficient product and query volume. Generalized search experiences will likely be dominated by incumbents that possess unrivaled data graphs. Shopify's integration of ChatGPT into its Shop app is another example of improved product discovery for small and medium-size businesses (SMBs) or niche products. Consumers can also benefit from individualized shopping assistants that turn popular prompts—such as creating a dinner menu—into transactions

1: "Ready for Launch: How Gen AI Is Already Transforming Marketing," Bain & Company, Jeff Katzin, Laura Beaudin, and Max Waldron, May 23, 2023.

2: "2023 Ecommerce Conversion Report," Digital Commerce 360, March 2023.

3: "E-Commerce Search UX," Baymard Institute, n.d., accessed August 23, 2023.

with grocers or Instacart. Vertical-specific applications targeting academic research, healthcare, and law are also emerging. Emerging technologies, like vector databases, Sensory's improved voice recognition, and Coactive's improved visual search, offer disruptive potential. However, the ability of these startups to build defensible business models, rather than incumbents integrating open-source models or acquiring competitors, remains unclear.

**Generative advertising technology:** Brands can conceivably generate individualized, n-of-1 shopping experiences with unique copy (offered by startups Jasper, Anyword, and Persado), visual assets (offered by Treat, Stable Diffusion, and Midjourney), or product recommendations based upon each shopper's journey. A/B testing can also be automated by startups like Evolve AI to optimize conversion flows and journey mapping. Analytics startups like CleverTap are combining cohort management and LLMs to tailor messaging for shoppers. Finally, digitizing B2B operations is a long-term tailwind to the e-commerce ecosystem; B2B vendors will integrate AI services and transition from static or account-based marketing toward personalization as well.

### *Challenges*

**Legal, regulatory, and privacy risk:** Litigation surrounding generative AI is a material headwind. Getty Images filed suit against Stability AI, while Microsoft, GitHub, and OpenAI fielded a class-action lawsuit on code-completion tools. Some incumbents, such as Adobe, have already established safeguards, but smaller startups may not be able to insulate themselves.<sup>4,5</sup> Additionally, terms and conditions vary across platforms, and it is unclear how much content must be changed from an LLM's output to circumvent legal risk. ChatGPT was also temporarily banned in Italy, and US lawmakers are determining if Section 230, a law that exempts online services from liability for the content they host, extends to generative AI providers. China and the EU have already passed regulation targeting generative AI, and nongovernmental organizations have called for a pause on AI development. Enterprises are also highly protective of proprietary data, and Samsung banned employee use of ChatGPT after discovering sensitive code was uploaded to its database. Additionally, the provenance of training data for foundation models is emerging as a growing concern for enterprise adoption, according to our conversations with startups. This ambiguity has not meaningfully slowed investment activity, per our conversations with investors, but brands and retailers are expressing trepidation in deploying functionality to production processes.

**Defensibility, economic viability, and moats:** The long-term differentiation and profitability of many generative AI companies is unsettled. Stability AI, creator of Stable Diffusion and an early mover in generative AI, is quickly burning through cash reserves.<sup>6</sup> Many applications use similar training datasets and fundamentally lack differentiation. Multiple investors we spoke with posited that missing OpenAI meant missing the singular winner of this startup wave. Over time, proprietary

4: "Adobe Is So Confident Its Firefly Generative AI Won't Breach Copyright That It'll Cover Your Legal Bills," *Fast Company*, Chris Stokel-Walker, June 8, 2023.

5: "Adobe to Sell a New AI Subscription With Copyright Services (2)," *Bloomberg Law*, Brody Ford, June 8, 2023.

6: "Stability AI Is on Shaky Ground as It Burns Through Cash and Looks at a Management Overhaul," *Semafor*, Reed Albergotti, April 7, 2023.

models may also converge in performance with open-source offerings introducing graduation risk. For startups, generative AI adoption may follow a similar path of cloud applications wherein early cloud adoption was a competitive advantage, but ultimately all applications migrated to the cloud, eroded this defense, and faced commoditization.

**Diligence:** Startups are approaching investors with minimal traction, which complicates the evaluation of product-market fit. This potentially places greater emphasis on founder profiles and the need for domain expertise. The current hype cycle is also greatly inflating valuations. Multiple investors we spoke with reiterated a willingness to withhold writing checks until the space settles. Valuing startups facing years of development and millions in training costs before customers are onboarded is also challenging, though this risk existed before the current frenzy. Startups will also struggle to grow into lofty valuations, and significant acquisitions will become less likely with minimal annual recurring revenue.

### Notable generative AI e-commerce companies in the prepurchase segment\*

Company	Subsegment	Year founded	Total raised (\$M)	Last financing date	Last financing size (\$M)	Last financing valuation (\$M)	Exit Predictor
Typeface	Content marketing	2022	\$167.0	June 29, 2023	\$140.0	N/A	96% - IPO
Synthesia	Videos	2016	\$155.5	June 13, 2023	\$90.0	\$1,000.0	98% - M&A
Fyllo	Content marketing	2019	\$148.0	October 24, 2022	\$50.0	\$600.0	87% - M&A
Jasper	Copy, writing & SEO	2018	\$140.7	October 21, 2022	\$140.6	\$1,500.0	N/A
Pinecone	Search	2016	\$138.0	April 27, 2023	\$100.0	\$750.0	98% - M&A
Zilliz	Search	2017	\$132.5	January 26, 2022	\$60.0	N/A	N/A
Persado	Content marketing	2012	\$113.0	February 10, 2021	\$0.5	N/A	75% - M&A
Stability AI	Images	2019	\$111.0	N/A	N/A	\$4,000.0	89% - M&A
Tome	Images	2020	\$81.2	August 9, 2023	\$60.0	\$600.0	87% - M&A
Neeva	Search	2018	\$77.5	May 24, 2023	N/A	N/A	N/A

Source: PitchBook • Geography: Global

\*As of August 18, 2023

Note: Probability data is based on [PitchBook VC Exit Predictor Methodology](#).