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MOSS ADAMS Generative Al Spotlight

Generative AI Investment Trends Overview

Our 2023 artificial intelligence (AI) report examined private dealmaking for the AI and machine learning (ML) vertical. Given the amount of current activity surrounding AI applications, this year's report focuses specifically on generative AI (GenAI)—a field within AI that produces human-like content using multimodal models trained on diverse inputs and techniques, such as transformers, large language models (LLM), and diffusion models.

GenAl integrations have recently become a top priority for businesses looking to optimize operations and maintain a competitive edge. In recent quarters, private dealmakers have been capitalizing on this interest with a surge of investment in the space.

Key trends include:

- Private capital investment into GenAl companies reached \$37.5 billion year to date (YTD) across 366 deals, outpacing the dollar amount raised in 2023 by over \$10 billion, with just over half the number of deals. This growth signals sustained momentum in the space and investor willingness to write larger checks even amid macroeconomic uncertainty.
- Cross-border venture capital (VC) deals likewise shot upward over the past five years, with US firms participating in a record 127 deals in 2023. 2024 is on pace to exceed this figure again for an eighth straight year of increased deal count.
- Sixteen GenAl M&A have been completed so far this year—already the second-highest annual count on record at just over halfway through the year.
- One-third of private equity (PE) deals YTD were growth and expansion deals, demonstrating how PE firms are utilizing relatively new deal types to gain exposure to nascent spaces.

TAFT KORTUS

Partner

Technology Industry Group Leader





SECTION TWO

Generative AI Macro Trends

FUNDING TRENDS

As an influx of capital pours into GenAI, US companies receive most global AI funding. The concentration of private capital firms in the United States has made it the natural primary global hub for GenAI developers and the deal flow they're attracting.

That said, US investors are turning their heads toward foreign players, completing more cross-border deals in recent years. Geopolitical risks endure in certain markets, and election uncertainty in the United States is a top concern for investors' strategies and projections.

The global fight against inflation is showing signs of progress, with the Bank of England enacting its first cut in over four years and the US Federal Reserve doing the same in September. Rate cuts are a positive signal to most private dealmakers, including PE firms and those hoping to make strategic acquisitions.

LABOR DYNAMICS

With Al going mainstream, labor dynamics are transforming to keep up with exponential demand. Nearly every emerging tech start-up incorporates an element of Al, and Big Tech is infighting to retain and attract Al engineering talent with salary packages reaching \$1 million dollars.

Rising talent acquisition costs may be eye-watering to smaller companies, but the largest players are working to outcompete one another. Poaching key talent is part of the GenAl playbook for Big Tech as well.

Regulators are tightening their grip on monopolies in industries ripe for Al transformation, potentially expanding entry points for more startups. Strategic M&A transactions are one way for companies to navigate Al expenditures while remaining competitive, and the number of these deals has risen to new heights over the past three years.

ENERGY CONCERNS

Generative AI necessitates immense energy to fuel its ever-growing computer power, making energy a premium for all consumers and raising concerns over further environmental degradation. To keep up with demand, an increasing number of datacenters have sprung up, but the maintenance and operation of these datacenters require vast amounts of electricity and water.

While an energy shortage is a growing concern, greenhouse gas emissions resultant of higher computing power are also on the radar. Technology companies have already begun to circumvent these issues by signing energy supply deals with nuclear power plants.

SMALL LANGUAGE MODELS

Costly datacenter infrastructure and large energy demands erect high barriers to entry, but small language models (SLMs) offer an alternative text-generation solution. **SLMs are more agile, simple, and cost-effective relative to mainstream LLMs**. With limited processing capabilities, the technology's simple underlying infrastructure reduces training time, increases resistance to cyberattacks, and makes it more malleable to specific use cases.

In an era of LLM giants powering open-source Al code and shaping Big Tech corporate strategy, SLMs democratize access and customizability of this novel technology.

EXPANDING FOOTPRINT

Beyond Big Tech, legacy industries like telecommunications and defense are embracing GenAl as a key piece of their growth strategies. Many telecom providers are deploying GenAl-enabled functions to expedite customer service and are investing in further applications to improve network capabilities, among other initiatives. **A 2023 McKinsey survey** revealed that 45% of telecoms have already seen material cost reductions—over 5%—in their customer service departments, and 25% had seen those cost reductions in their network domains.

Al-powered defense technology plays top the list of recent VC financings in the robotics and drones space, underscoring national security priorities related to GenAl capabilities.



SECTION THREE

Investment & Market Overview

VC INVESTMENT: MEGADEALS LEAD CONTINUED SURGE IN MOMENTUM THIS YEAR

FIGURE 1: GenAl VC Deal Activity



FIGURE 2: Average GenAl VC Pre-Money Valuation by Stage (\$ Billion)

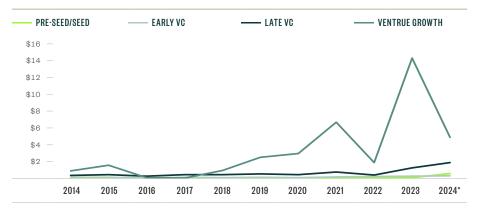
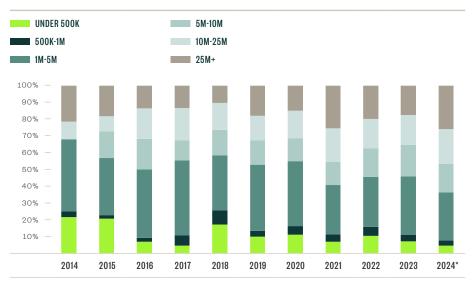


FIGURE 3: Share of GenAl VC Deal Count by Size Bucket



*As of 07/22/2024

FIGURE 4: Share of GenAl VC Deal Count by Stage

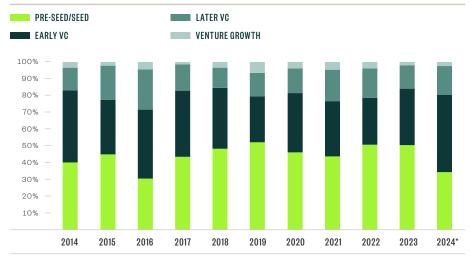


FIGURE 5: Cross-Border GenAl VC Deal Activity with US Firm Participation



FIGURE 6: Share of GenAl VC Deal Value by Industry

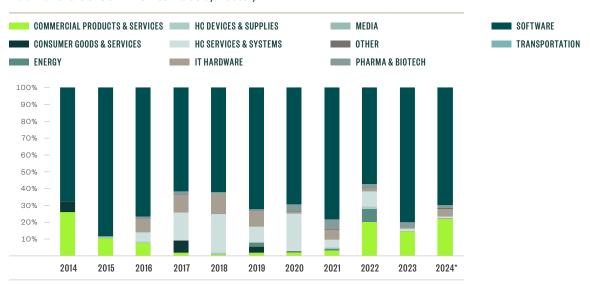


FIGURE 7: Share of GenAl VC Deal Count by Industry

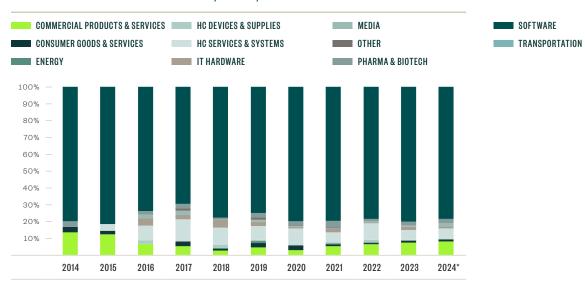
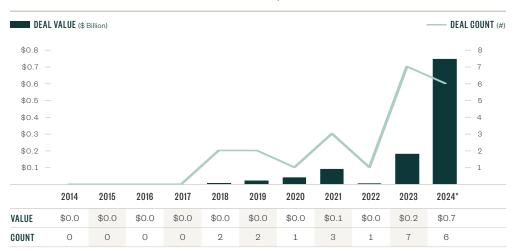


FIGURE 8: GenAl and Robotics & Drones VC Deal Activity



*As of 07/22/2024

VC has been the favored track for GenAl investment to date, with deals generating more than 80% of total private capital value last year and more than 70% so far this year. GenAl has exploded in VC markets in recent years, with a compound annual growth rate (CAGR) of 43% between 2019 and YTD 2024, and cumulative deal value reached \$27.3 billion YTD (Figure 1).

Three megadeals secured by CoreWeave, xAI, and Scale AI in Q2 led the way for 2024 to set the annual record for funding at just over halfway through the year. These highly capitalized businesses each represent the growing interest in generative technologies among incumbent tech leaders. CoreWeave serves top enterprise clients and received backing from Zoom Ventures, xAI was co-founded by Elon Musk, and Scale AI is backed by a large group of investors, including Amazon, Intel Capital, and Meta.

Some megadeals include large portions of debt financing, including CoreWeave's most recent round, which included \$7.5 billion in debt and \$1.1 billion in equity. These deals can skew check size and valuation data, particularly for later-stage companies. For example, the average pre-money valuation for both the late-stage

VC and venture-growth categories exceeded \$1.8 billion YTD (Figure 2). However, removing outlier megadeals still reveals a strong pipeline of larger venture check sizes being deployed to smaller players in the space.

Among all VC deals YTD, 18.7% were between \$1 million to \$5 million each, 11.2% were between \$5 million to \$10 million, and 13.5% were between \$10 million to \$25 million (Figure 3).

Earlier-stage companies also represent the majority of GenAl deals, creating a larger pipeline of eventual exit contenders on a five-to-10-year horizon. Pre-seed or seed deals represent more than one-third of total deal count YTD (Figure 4). The current pipeline for exits remains small but growing, with 11 exits YTD compared with 12 for full-year 2023.

Concerns have arisen surrounding the sustainability of such a strong volume of investment and massive valuations relatively early on in a technology's development. Investors are also wary of the valuation traps created in 2021 that have since hamstrung certain exit candidates.

Companies are projected to spend around <u>\$1 trillion on capital expenditures</u> in coming years, with much of that dedicated to data infrastructure, semiconductor chips, and new Al integrations. US utilities will likely experience strain from the high volume of power needed to run Al programs. Infrastructure availability and growing pains may ultimately create an upper limit on GenAl's benefits as well.

Dealmakers are nonetheless eager to continue deploying capital, with greater emphasis placed on the realities of future infrastructure planning. GenAl may even prove to be a key player in improving its own infrastructure, with early applications for code writing and chip design catching the eyes of investors. As discussed in our recent semiconductors report, investment into chips and related technology has swelled alongside Al.

Global Outlook

Cross-border deals have also shot upward over the past five years, with US firms participating in a record 127 foreign deals last year (Figure 5). With 75 such deals closed YTD, 2024 is on pace to exceed this figure again for an eighth straight year of increased deal count. Investors have demonstrated their willingness to take on a higher degree of macro risk in order to secure a strong pipeline of GenAl deals, and global interest in the technology is supporting new entrants seeking funding.

While the United States remains the top market for Al companies, other global leaders present opportunities as well. Institutions like the Alan Turing Institute in the United Kingdom and Tsinghua University in China have contributed to pioneering research in Al-related programs, attracting more Al founders and foreign funders alike to nearby dealmaking hubs. London-based Wayve and Beijing-based Moonshot Al both raised \$1.0 billion rounds this year with participation from Microsoft, for example.

Industry Diversity

Examining the top industries represented across GenAl VC activity reveals greater diversity beyond information technology (IT) compared with earlier years of the technology's development. The IT, health care, B2B, and B2C industries have all seen double-digit deal counts so far this year (Figure 7).

As GenAl advances beyond its initial experimental and formation stages, the market has moved forward into the next phase of development, where the strongest specific applications will be identified and expanded upon. A higher volume of niche applications and hardware integrations is on the horizon.

Robotics and Drones

One evolving application for GenAl lies in the robotics and drones space, where VC financing is being deployed to a small but rapidly growing population of companies. At the nexus between Al and robotics, common goals include labor shortage mitigation, more efficient logistics, and a reduced need for human labor in dangerous situations.

GPs stress the need for software platforms to be <u>integrated alongside hardware</u> <u>like robots</u> to create the sustainable revenue streams that are so crucial for investors, meaning future crops of Al-enabled robotics startups will likely operate under the familiar hardware-as-a-service model.

Well-capitalized companies in the space include Figure AI, developer of humanoid robots for warehousing and retail, and Skydio, manufacturer of AI-powered drones for both industrial and military use. Several other defense tech companies are also integrating AI into surveillance, drone, and dual-use goods. Notable players include Anduril, Shield AI, and Epirus, each of which have raised at least one VC round of at least \$200 million since 2022 and have achieved unicorn status.

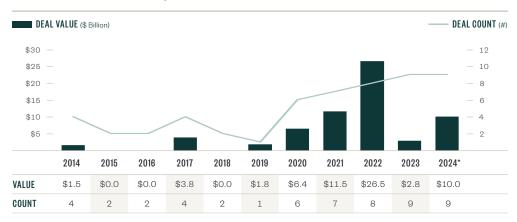
Note, the VC activity data shown doesn't include Anduril's \$1.5 billion Series F, which closed on August 8, 2024. The company reached unicorn status prior to this deal.

National security concerns regarding AI capabilities in spyware and warfare have sparked increased interest in private dealmaking and contracting by government agencies.



PE INVESTMENT: GROWTH AND EXPANSION DEALS DRIVE MORE INVOLVEMENT IN EMERGING TECHNOLOGIES

FIGURE 9: GenAl PE Deal Activity



*As of 07/22/2024

FIGURE 10: Share of GenAl PE Deal Count by Type



*As of 07/22/2024

FIGURE 11: Share of GenAl PE Deal Value by Type



FIGURE 12: Share of GenAl PE Deal Count by Top Verticals

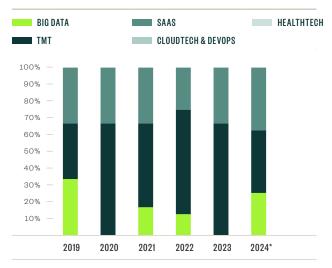
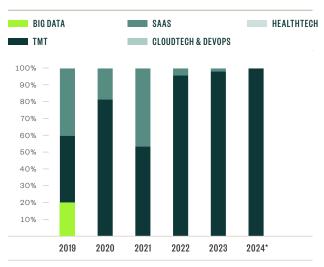


FIGURE 13: Share of GenAl PE Deal Value by Top Verticals



*As of 07/22/2024

PE firms have maintained a relatively limited footprint in GenAl so far, given its recent entry to the mainstream and how few companies are mature enough to fit the typical profile for a buyout candidate. However, PE deals have ticked upward each year since 2020, and YTD deal activity already outpaces last year's levels with nine deals totaling \$10 billion in aggregate (Figure 9).

One-third of these deals were minority stake PE growth and expansion deals, demonstrating how firms are utilizing relatively new deal types to gain exposure to nascent spaces (Figure 10).

PE firms have also closed several take-private transactions over the past two years, representing five of the top 15 largest deals in that period. Data analytics firm Alteryx was taken private for nearly \$4 billion in Q1 of this year after facing competition from Microsoft and Oracle and went on to receive an additional injection of development capital in June.

Two of the five largest take-privates were identified as part of an add-on strategy, underscoring how GenAl companies can provide complementary backing for

certain platform plays, primarily for the B2B software industry—a familiar market for PE firms.

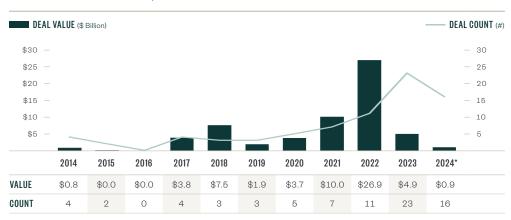
While the combined influence of Big Tech and select unicorns permeates the AI space and dominates headlines, the market is still quite fragmented. The current lack of standardization and ongoing surge of new entrants will presumably leave PE firms with a wealth of options in the coming years in the form of take-private and roll-up candidates to further consolidate the GenAI space.

The largest overall PE deal so far this year has been a \$9.2 billion investment of development capital into Vantage Data Centers, which aims to develop next-generation data centers designed specifically for Al and large-scale cloud deployments. Both Silver Lake and DigitalBridge Group provided follow-on capital in a nod to the importance of infrastructure build-outs for Al products.

Data center developers are another common business model that PE firms target within the scope of GenAl given their capital-intensive operations and potential role in pick-and-shovel strategies. The cash flow profiles for Al infrastructure developers are likely to continually increase as adoption and demand for software rises.

M&A ACTIVITY: BIG TECH IS FEELING THE PRESSURE AND INORGANIC GROWTH RE-ENTERS THE SPOTLIGHT

FIGURE 14: GenAl M&A Activity



*As of 07/22/2024

FIGURE 15: Share of GenAl M&A Count by Type



For tech incumbents, there are certainly potential operational advantages to be derived from GenAI, and these are the primary drivers of incumbents' involvement. However, perhaps an equally powerful motivator is their concern over the downside competitive risk that could occur should others secure stronger relationships with the eventual transformative players in the space. In other words, tech giants may be investing in GenAI in part to diminish their fear of missing out.

When questioned about Al-related capital expenditure growth in <u>Alphabet's Q2</u> <u>2024 earnings call</u>, CEO Sundar Pichai stated, "The risk of underinvesting is dramatically greater than the risk of overinvesting for us here." In addition to its own product buildouts, Alphabet has participated in 11 GenAl deals and has made three GenAl acquisitions since 2023.

Search Engine Developments

Big Tech players like Alphabet have greater stockpiles of capital to deploy for Al development and integrations, but there are no guarantees of success in this space. One critical area of development in the race between Big Tech players is the evolution of search engines, and competition is only heating up because of GenAl's proliferation.

<u>Legacy search engines</u> are receiving mounting criticisms backed up by a recent study that demonstrated a reduced quality of search results, a high volume of advertising and spam, and an overall inability to identify and filter out lower-quality content.

Antitrust authorities have heard these concerns and launched investigations into and litigation against Big Tech players. In January 2023, the <u>US Department</u> <u>of Justice (DOJ) sued Alphabet's Google</u> for monopolizing digital advertising technologies (adtech) partially through serial acquisitions, and the court ultimately ruled in favor of the DOJ.

Subsequently, in August 2024, the DOJ announced it was considering the enforcement of various strategies to https://prescription.org/break-up-Google's monopoly. The most disruptive result of these ongoing proceedings would force Alphabet to divest certain business segments like Chrome, the Android operating system, or Google Ads. Alternative rulings could require the company to share more data with competitors or remove requirements for companies to allow their content to be fed into Google's own Al algorithms.

In either case, opportunities for new entrants in adtech and GenAl spaces may be expanding. Divestment of the Android system, for example, could potentially open more doors for application-software-based businesses to attract customers, as Google's existing ownership structure involves layers of fees and competitive restrictions for applications that launch on their platforms.

Divestment of the Google Ads platform could loosen Alphabet's control over advertising space. The legal proceedings are likely to be appealed and drawn out for potentially several years as Google fights to maintain its spot.

Other restrictions enforced by regulators could also reshape the landscape of digital advertising by lowering the hurdles faced by alternative adtech firms or search engines. The potential transformation of dominant search offerings will have major consequences for advertisers and search engine optimization practices, therefore extending the impact of recent litigation and M&A deals into nearly every industry. GenAl is already transforming adtech as companies race to adapt.

In response to Big Tech vulnerabilities that have come to light, GenAl developers are rethinking the traditional search engine experience and incorporating Al into fundamental construction of alternatives to fix the issues plaguing existing dominant engines.

ChatGPT's highly anticipated <u>SearchGPT product</u>, announced in July 2024, is the leading source of new competition for Google and would incorporate GenAl into its fundamental construction with features like visual results, follow-up questions to refine search terms, and more transparent attribution of sources. Disruption in the ubiquitous and foundational search engine divisions of top technology conglomerates represents one leading motivator for M&A dealmaking in the GenAl space.

Beyond M&As

However, not all private dealmaking falls under the traditional definitions of M&A. Big Tech firms are fortifying themselves against antitrust scrutiny and competition through a less traditional private deal type. Google, Amazon, and Microsoft have each struck large product licensing deals with leading GenAl start-ups including Inflection Al, Character.Al, and Adept.

As part of these deals, key personnel, like founders and lead management, are hired by the Big Tech company, essentially absorbing the startup and its technology without the due diligence or transition time associated with a traditional acquisition.

For most smaller players, the more direct and potentially cost-effective channel through which to absorb AI intellectual property and talent is still through a strategic acquisition. Developing new AI divisions requires heavy upfront investment and uncertain timelines for deployment, and most companies do not have the means or motivations to enact the targeted product licensing and key personnel poaching deals previously mentioned.

Strategic acquisitions can contribute to the maturation of the Al industry through the consolidation and combined resources of the parties involved. So far this year, strategic transactions represent more than half of total GenAl M&A count, which has already reached its second-highest annual count on record.

Interest Rate Impacts

Continued interest rate cuts will ease overall growth concerns for companies as well as leverage costs. For this reason, inorganic growth is now more of a priority for many firms compared with the peak rate hike environment, which caused it to take a back seat over the past 18 months.

Cross-Boarder Activity

Cross-border M&A activity in the space is also on the rise, with US firms participating in a record 10 foreign transactions so far this year, up from six in 2023. While the number of these deals has grown steadily since the late 2010s, it remains a small part of the GenAl private dealmaking landscape.

The cumulative value of these deals has fluctuated significantly over the years with only a small volume of larger financings in certain years. Recalling the previously discussed VC activity for GenAl-enabled robotics companies, the largest cross-border acquisition of the past 18 months was that of Clearpath Robotics, a former spin-off of the University of Waterloo in Canada and developer of self-driving technology and robotics for warehousing. The company was acquired more than a decade later by US-based Rockwell Automation for over \$600 million.

US acquirers complete a higher volume of cross-border Al transactions in allied countries, including Canada, UK, the Netherlands, and even Israel, despite ongoing geopolitical uncertainty in the Middle East. A few deals with India and Australia have also closed over the past two years.

Companies face competing pressures: to expand globally for growth, and to localize their supply chain and onshore manufacturing domestically. Foreign direct investment has stagnated since 2021, while trade tensions between the United States and China have heightened. These conditions will likely stunt any significant trend toward greater cross-border investments between the two countries in the near term.

Largest Al private capital deals YTD*

	COMPANY	DEAL	. SIZE (\$M)	DEAL TYPE	INDUSTRY
VC	CoreWeave	\$	8,600	Series C	Software
	xAI	\$	6,000	Series B	Software
	Anthropic	\$	4,000	Later VC	Commercial Services
	Anthropic	\$	1,200	Series F	Commercial Services
	Scale Al	\$	1,000	Series F	Software
	Xaira Therapeutics	\$	1,000	Series A	Pharmaceuticals and Biotechnology
PE	Vantage Data Centers	\$	9,200	Growth/Expansion	IT Services
	Alteryx	\$	3,970.287	Public to Private	Software
	Exiger	\$	1,350	Buyout/LBO	Commercial Services
	Centersquare	\$	775	Add-on	IT Services
	AdTheorent Holding Company	\$	324	Add-on	Software
	Tekion	\$	200	Growth/Expansion	Software
M&A	Tronic	\$	12,250	Corporate Divestiture	Software
	StreamSets	\$	2,130	Corporate Divestiture	Software
	Motional	\$	923	Acquisition	Commercial Transportation
	Corvus	\$	427	Acquisition	Insurance
	Spiff	\$	419	Acquisition	Software
	Habu	\$	173.374	Acquisition	Software

^{*}As of 7/22/2024

^{*}M&A deals shown excludes buyouts already listed in PE $\,$



SECTION FOUR

Spotlight: Telecom Companies are Embracing GenAI, Too



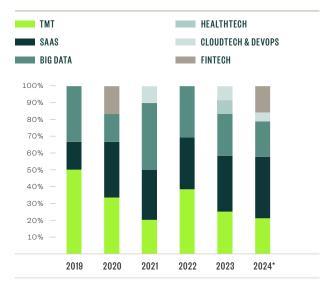
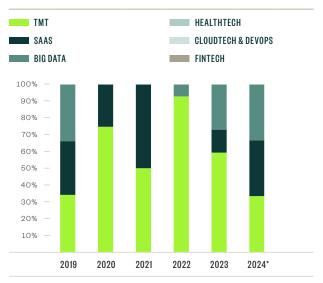


FIGURE 17: Share of GenAl M&A Value by Top Verticals



Legacy industries outside of Big Tech's domain often get lost in broader conversations surrounding emerging technologies like GenAl. However, this doesn't mean these industries aren't actively invested. In fact, the technology, media and telecommunications (TMT) vertical is a consistent presence on the list of top verticals for GenAl M&A and PE deal activity (Figures 13, 18).

Through direct investments and participation through their corporate VCs (CVCs), US telecom giants, including AT&T, Verizon, and Comcast, have demonstrated interest in GenAl's potential to innovate and reinvigorate industry growth:

- AT&T is an active direct investor in several Al platforms, including O-RAN Alliance, which uses Al to improve radio access and reduce costs for global telecom operators.
- Verizon has participated in several AI deals over the past eight years, including network security platform ProtectWise and the AI Foundation.
- Comcast invested in two AI companies in 2023: deep-fake detection developer Reality Defender and consumer insight platform Covatic.

Recent direct investments made by these three companies reflect a growing desire to keep up with GenAl on a strategic basis rather than a financial-return basis, as most deals so far are relatively small in size and in early stages.

<u>McKinsey survey data</u> shows that 45% of telecoms have already seen GenAl applications reduce costs by more than 5% in their customer service departments, and 25% have experienced those cost reductions in their network domains.

Fewer respondents identified cost benefits in their information technology (IT), marketing, and support functions to date. Industry leaders have publicly embraced GenAl initiatives with a particular emphasis on customer support.

In 2023, AT&T launched a first-generation ChatGPT-enabled tool for its software developers and coders, with additional internal use cases for its other employees. In 2024, Verizon rolled out new human-assisted GenAl applications specifically targeting customer service improvements, including expedited query responses and personalized shoppers.

These front-office deployments target one of the more time-consuming and notorious operational areas for telecoms—an industry that earned the lowest average Net Promoter Score (NPS) of 31, according to 2021 data. More efficient

and data-driven service could provide a much-needed boost to the industry's pain points.

Other key focus areas for telecoms are fully fleshed-out 5G networks, fiber deployment, and rising demands for connectivity across a growing number of devices. Mixed reality, Internet of Things, and Al-enabled hardware will further test the limits of telecom networks and data services.

Network build-outs require large investments of both time and capital, so the industry is keen on GenAl's potential to benefit these processes as well. In 2023, **Comcast and Broadcom announced plans** to embed Al and ML technology within nodes, amps, and cable modems throughout the last several miles of Comcast's network to automate more functions and enhance monitoring.

While private investment into companies specifically at the cross section of telecom and GenAl has yet to scale significantly, broader GenAl developers show promise in benefiting a variety of industries.

Telecoms have demonstrated an eagerness to adopt new efficiency-oriented strategies in both their front and back offices. Across the board, most industries appear to be operating within the initial valley of the J curve, with large-scale returns from their investments into GenAl still on the horizon.



SECTION FIVE

Methodology

Standard PitchBook methodology regarding venture transactions and venture-backed exits was used for all datasets, and similarly for PE or other private investment types. Full details can be found **here**.

Deal and exit activity data utilized PitchBook's dedicated vertical of Generative Al unless otherwise stated.

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