

2024 Tech Trends

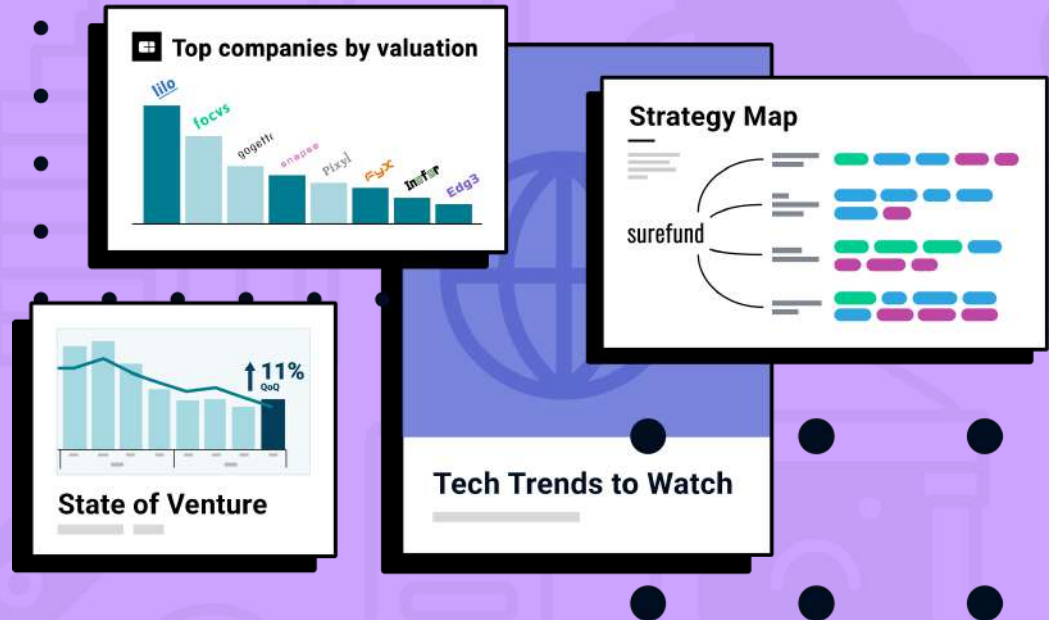
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CBI Analyst

◆ Amazon funds Hyper setting the stage for expansion in VTuber avatar market

Hyper closed a seed funding round, securing \$3.6 million to enhance its VTuber-friendly avatar platform.

- ✓ Amazon's Alexa Fund is a noteworthy contributor to the round, hinting at strategic interest aligning with Amazon's media and devices sectors.
- ✓ The capital is allocated for both business expansion and the development of new products, including Hyper AI, an AI-driven avatar feature.

Tech trends

AI

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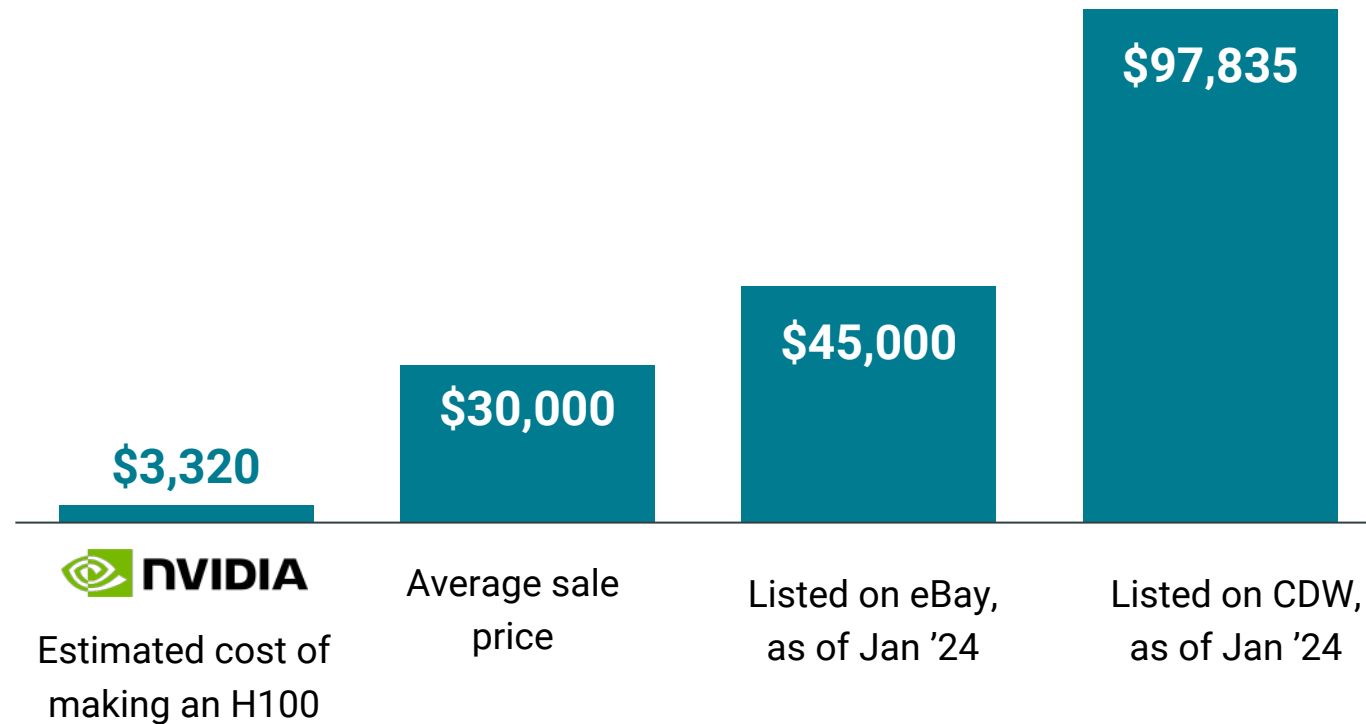
AI

GPU shortage forces companies to be smarter



Companies are desperate for GPUs

H100s sell at a massive mark-up








“The GPUs at this point are considerably harder to get than drugs.”

Elon Musk at the WSJ
CEO Council Summit

Startups link up with big tech to access their AI chips and compute power







Generative AI companies with two or more big tech investors (as of 1/30/2024)

Company	Big tech investors				
	amazon	Google	Microsoft	Meta	NVIDIA
 Hugging Face	✓	✓			✓
ADEPT			✓		✓
AI21labs		✓			✓
ANTHROPIC	✓	✓			
Inflection			✓		✓
inworld			✓	✓	
 OpenAI	✓*		✓		
 runway		✓			✓
 synthesia		✓			✓
 Typeface		✓	✓		

Source: CB Insights financing data. Includes investments from [M12](#), [GV](#) (Google Ventures), and [NVentures](#). *AWS.

While also looking outside of big tech for cheaper cloud compute

Nvidia is giving priority access to its GPUs to smaller specialty cloud providers CoreWeave and Lambda Labs, which are offering cloud GPU access at lower costs to enterprises

Cloud provider	GPU model	Price per hour
 AWS	A100 40 GB p4d.24xlarge	\$4.10
 Azure	A100 (80 GB) NC24ads A100 v4	\$3.67
 Google Cloud	A100 40GB	\$3.48
 CoreWeave	A100 40GB NVLINK	\$2.06
 Lambda	NVIDIA A100 PCIe 40GB	\$1.29
 FluidStack	A100 40GB NVLINK	\$1.29

But as demand continues to outstrip supply, companies aim to optimize their AI models to reduce compute time








“For the deployment side of things, we found that the performance of our training process was quite slow, especially when it gets into these large language models and when you train from scratch. **MosaicML offers what's called programmatic optimization, which is not so much on the hardware side of things, but rather on the algorithmic side. Can you find ways of optimizing the time it takes to get to a certain performance bar?... We did experiments where we used MosaicML programmatic optimization versus not, and we did see a 12% compute hour reduction for some of the models.**”











MosaicML customer

Senior Manager, Data Science at \$1B+ valuation technology company

Startups building software to help AI models run efficiently on available hardware gain traction

Company	Headquarters	Total funding	Latest funding round	Application
 CentML	Canada	\$31M	Seed VC (10/25/2023)	Identifies bottlenecks & underutilized hardware to optimize model deployment
 ThirdAI	US	\$6M	Seed VC (8/13/2021)	Enables AI models to run on cheaper CPU hardware
 run: ai	Israel	\$118M	Series C (3/15/2022)	Optimizes GPU resources between the cloud and on-prem
 OMNI ^{ML}	US	\$10M	Acquired by Nvidia (2/1/23)	Shrinks models so they can run on edge devices
 deci. <small>Break the AI Barrier</small>	Israel	\$55M	Series B (7/13/2022)	Offers hardware-aware AI optimization

GPU shortage also opens the door for experimenting with novel processor approaches

Approach		Company	Headquarters	Latest funding round
Photonic	Uses light instead of electrons to transfer data, with the aim of increasing speed and bandwidth while using less energy	 LIGHTMATTER	United States	Series C (12/19/2023)
		 celestial AI™	United States	Series B (4/13/2023)
		 LUMINOUS	United States	Series A (3/3/2022)
Neuromorphic	Processes information using analog signals passed between artificial “neurons” and “synapses” to reduce energy consumption	 GrAI Matter Labs	France	Acquired by Snap (10/1/2023)
		 POLYN TECHNOLOGY NEUROANALOGIC ANALOG SIGNAL PROCESSING	Israel	Unattributed (12/22/2022)
		 innatera	Netherlands	Accelerator (1/1/2021)
In-memory computing	Brings processors and memory together onto a single chip to increase efficiency of data transfers and reduce energy consumption	 RAIN	United States	Series A (8/1/2023)
		 UNTETHER AI	Canada	Series B (7/20/2021)
		 后摩智能 HOUMO.AI	China	Seed (4/18/2022)
3D chips	Highly integrated chips are stacked vertically to increase processing power and save energy	 GRAPHCORE	United Kingdom	Series E (12/29/2020)

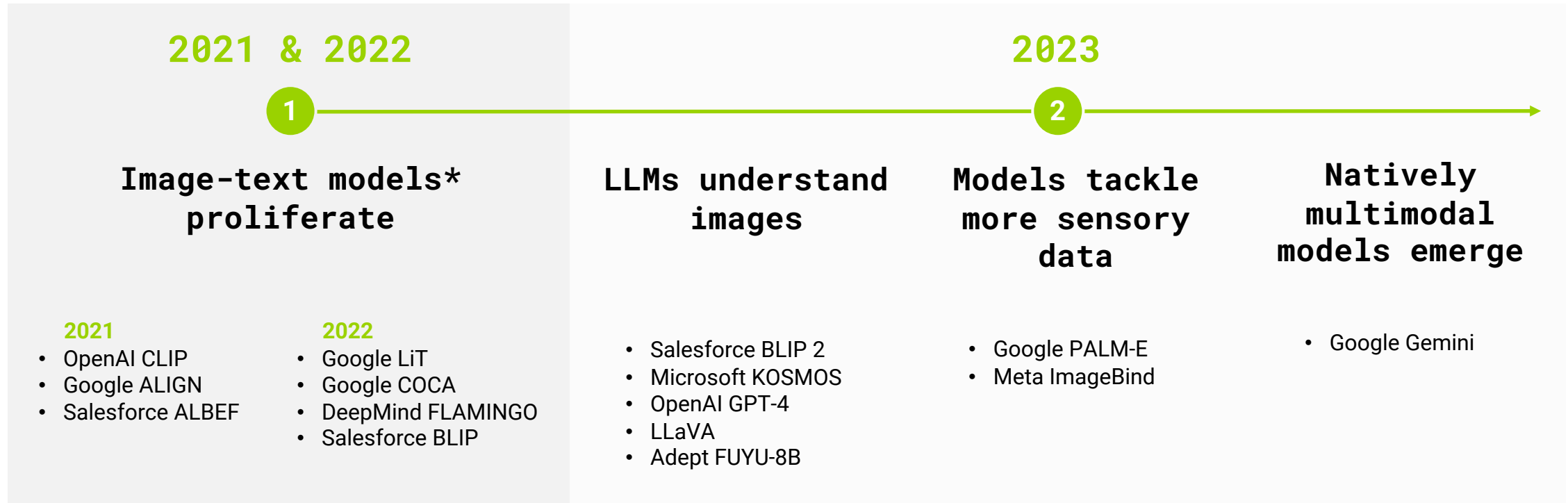
AI

Multimodal AI will rise on corporates' wish lists



Multimodal AI is in its infancy, but models are quickly evolving












Google introduces first commercial model taking diverse inputs in December 2023





Source: Published research; press releases. *E.g., image generation based on text, image description generation.

Note: Multimodal AI refers to models that can understand and respond in multiple data modalities (text, video, image, etc.).

More LLM developers will follow in Google's footsteps to remain competitive

Company	Total funding	Mode	Multimodal features
 OpenAI	\$14B	GPT-4V Text, image → text	
ANTHROPIC	\$3.4B	Claude-2 Text only	
Inflection	\$1.5B	Inflection-2 Text → text, image	
 ALEPH ALPHA	\$642M	Magma Image → text	
 cohere	\$469M	Text only	
AI21 labs	\$317M	Text only	
	\$135M	Grok Text only	

 Limited modalities commercially available

 In the roadmap or not announced

Models that can accept diverse inputs open up new opportunities for AI in industries that are highly multimodal





Google will bring Gemini-based models into its MedLM family of foundation models fine-tuned for healthcare use cases in coming months



“Medicine is an inherently multimodal discipline. When providing care, clinicians routinely interpret data from a wide range of modalities including medical images, clinical notes, lab tests, electronic health records, genomics, and more. Over the last decade or so, AI systems have achieved expert-level performance on specific tasks *within specific* modalities...**But how do we bring these capabilities together to build medical AI systems that can leverage information from all these sources?”**

Greg Corrado, Head of Health AI, Google Research
Yossi Matias, VP, Engineering and Research, Google Research

Watch for commercial applications across healthcare, automotive, retail, and manufacturing

Sector	Company	Multimodal AI application
Healthcare diagnostics		<p>ArteraAI's prostate test analyzes both biopsy images and patients' clinical data to predict patient outcomes</p> <p><i>Raised \$90M in Q1'23 from investors including Coatue and J&J; raised \$20M in Q1'24</i></p>
Autonomous vehicles		<p>Ghost Autonomy explores using multimodal LLMs in autonomous driving</p> <p><i>Raised \$5M from the OpenAI Startup Fund in Q4'23</i></p>
Retail		<p>Meta is bringing multimodal AI to consumers with its Ray-Ban smart glasses</p>
Robotics		<p>Google's multimodal model PaLM-E targets robotics, combining language with robotic sensory data</p>

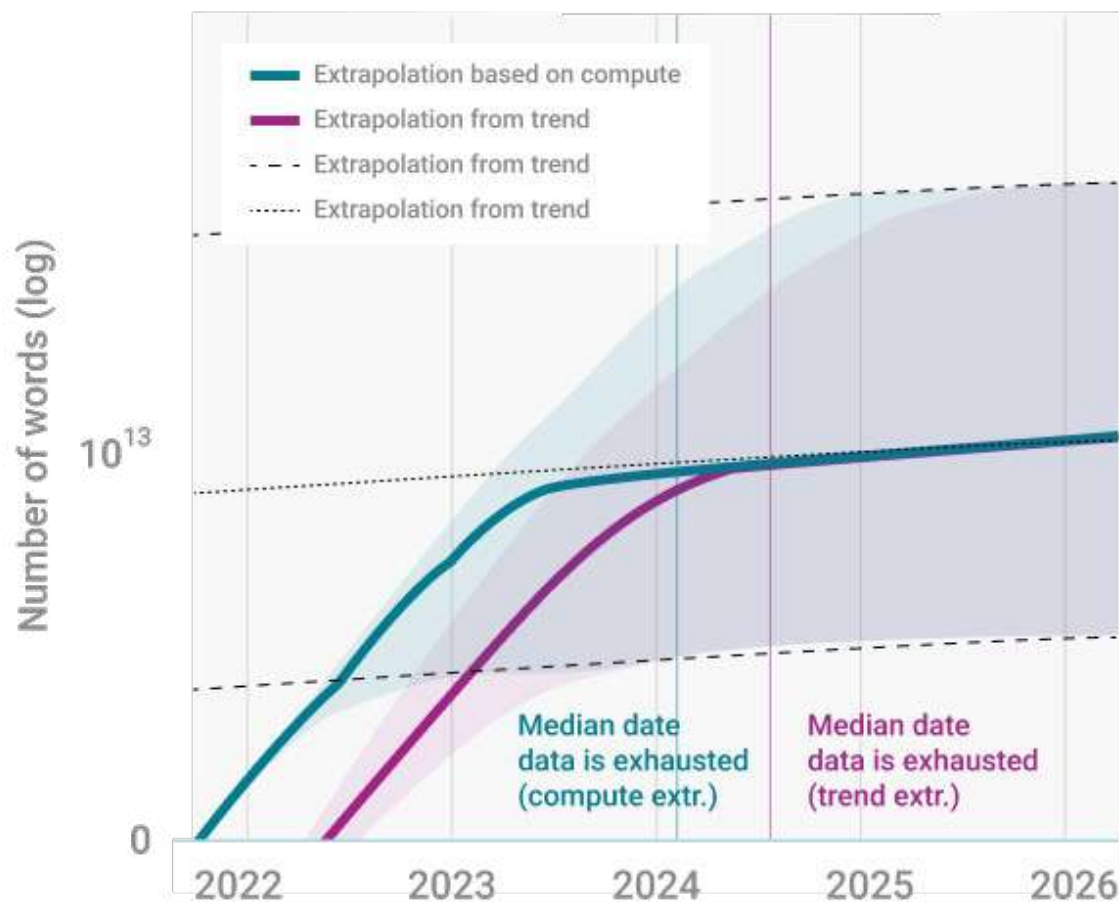
AI

Synthetic data bonanza



We are running out of high-quality data to train AI models

Researchers estimate that, by **2026**, we will exhaust high-quality text data* for training LLMs – a trend that can slow down AI progress.



Source: Villalobos et al., "Will we run out of data? An analysis of the limits of scaling datasets in Machine Learning."

*Data from sources such as news articles, Wikipedia, filtered web content.

Scraping proprietary sources is getting harder

2023

January

1

Getty Images
sues Stability AI

March

2

X imposes a
\$42K bulk access fee
for 50M tweets

July

3

Reddit starts
charging \$0.24/1K
API calls

December

4







NY Times sues
OpenAI and Microsoft
for copyright
infringement

“Scraping proprietary data to train generative AI models for commercial application is now **universally recognized as an unsustainable business tactic.**

It's fraught with legal, financial, and reputational challenges.”

Shutterstock CEO Paul Hennessy, Q4'23 earnings call

Cost and scarcity drive model developers to experiment with synthetic data

Company	Synthetic data initiatives
	<p>Raised \$3.5M in seed funding in Q3'23 from Spark Capital, Village Global, and Replit CEO Amjad Masad to train custom LLMs based on a synthetic data platform</p> <p>Released glaive-coder-7b, a coding model trained with 140K+ synthetic programming problems and solutions</p>
	<p>Trained LLMs (OpenHermes-2, Nous Hermes) on 900K to 1M data entries generated by GPT-4</p> <p>Raised \$5.2M in seed funding in Q4'21 from DistributedG, OSS Capital, and others</p>
	<p>Trained small language models phi-1 and 2 on GPT-generated synthetic textbooks</p>
	<p>Released Stable Beluga 1 and 2 language models fine-tuned on synthetic data</p>
	<p>Released AlphaGeometry model in Q1'24 capable of solving Olympiad-level geometry problems – the model was trained on a synthetic data pool of 100M unique examples</p>
	<p>CEO Sam Altman was quoted as saying all data will soon be synthetic</p>

Synthetic data providers will next target niche applications

The logo for Aindo, featuring the word "aindo" in a lowercase, rounded, sans-serif font.

Stage: Series A

“Synthetic data applied to healthcare is not common, so it was important to fit our needs and protect sensitive data.

Aindo's technology for privacy enhancement was crucial...”

– [Customer transcript](#)

The logo for Scale, featuring the word "scale" in a lowercase, rounded, sans-serif font.

Stage: Series E

Launched Scale Synthetic in February 2022 with **early customers including the US Department of Defense and autonomous trucking company Kodiak Robotics.**

The logo for Gretel, featuring the word "gretel" in a lowercase, rounded, sans-serif font, with the "g" in blue and the rest in black.

Stage: Series B

“For banks, where fraud typically constitutes less than 100th of a percent of total data, Gretel’s software can **generate thousands of edge case scenarios on fraud and train [AI] models with it.**” – FT

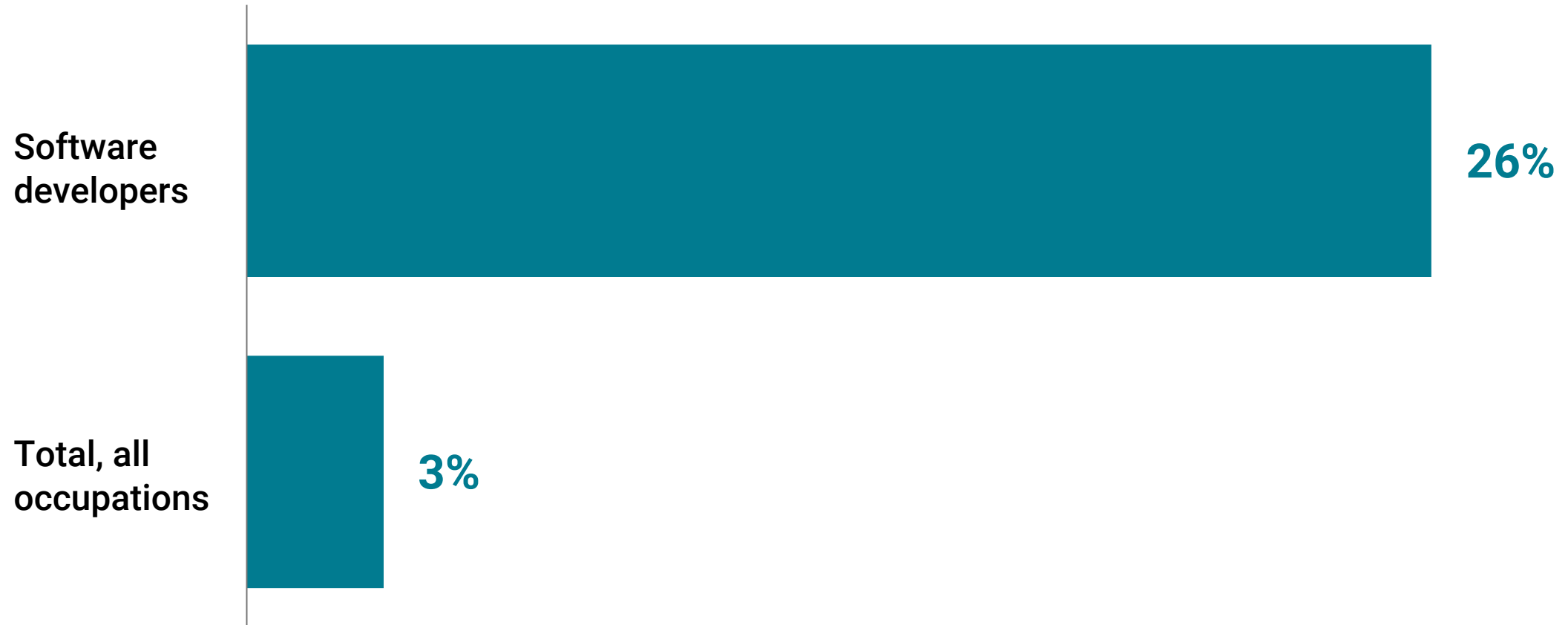
Enterprise

DIY software development upends engineering orgs



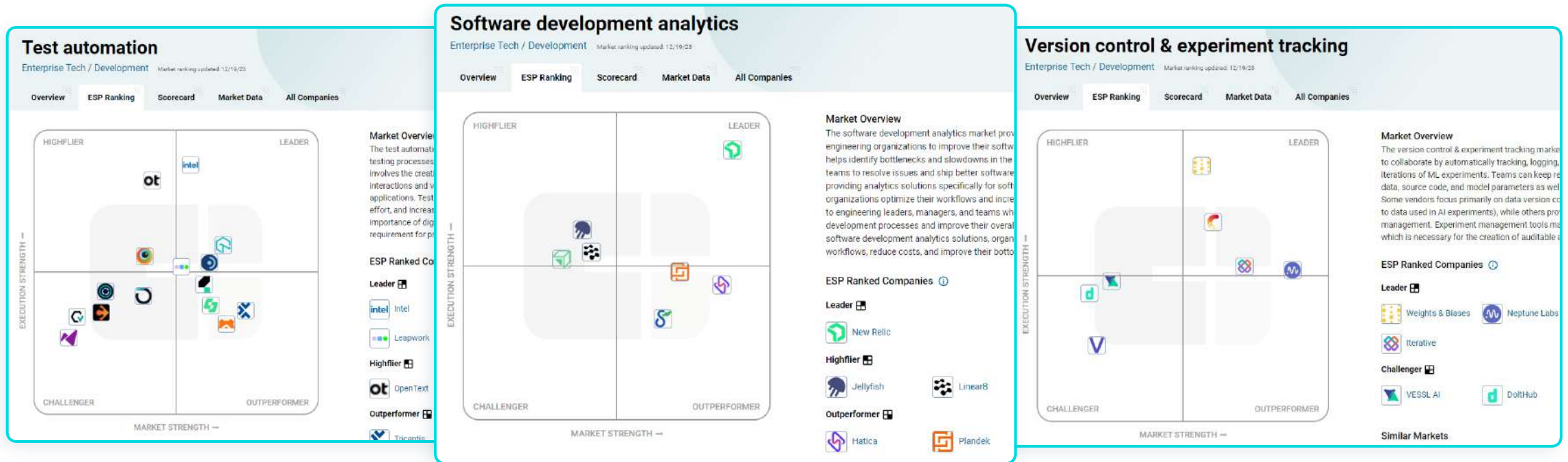
Skilled software developers are in high demand

Percent change in employment, projected 2022-2032



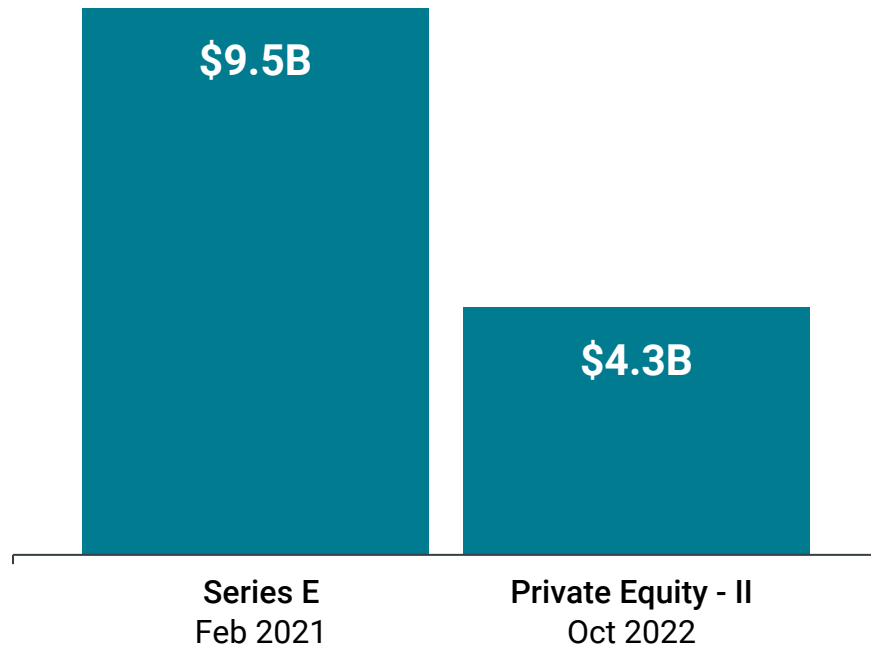
A massive number of software development tools have emerged to assist developers

CB Insights tracks over 70 tech markets related to enterprise software development

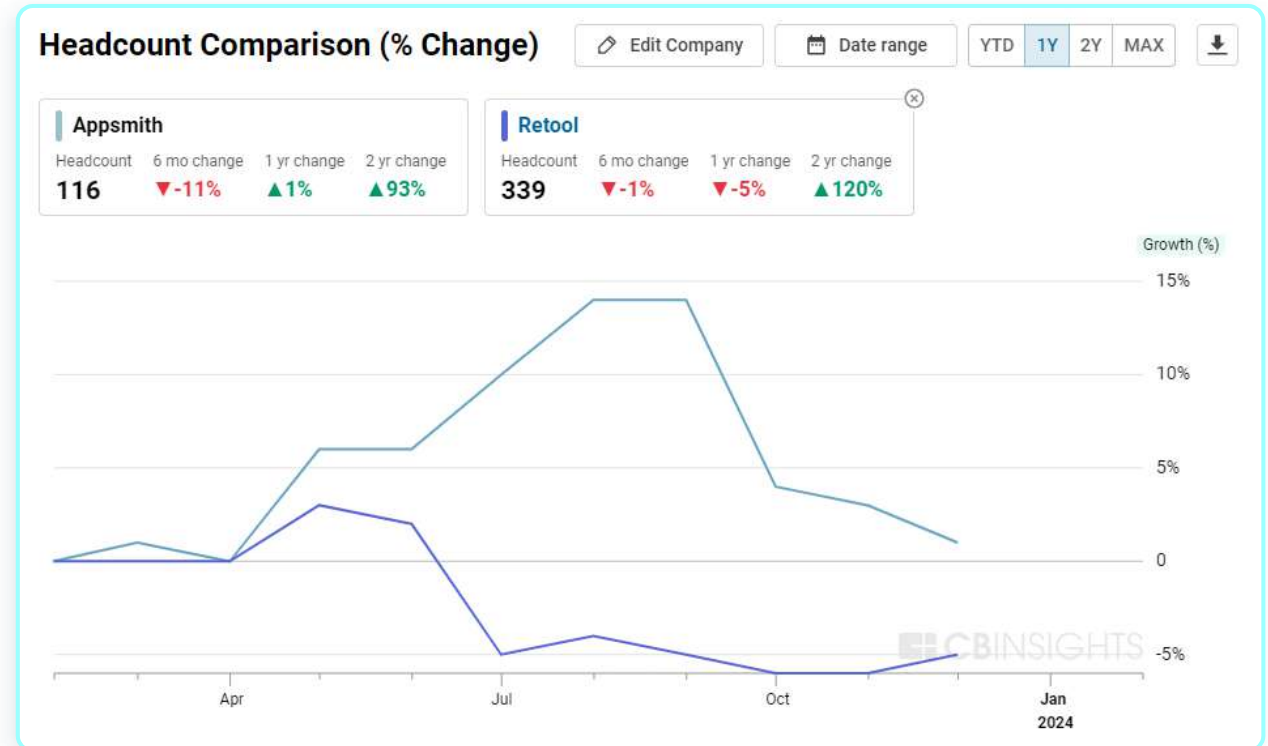


Skills gap has given rise to “no-code” and “low-code” platforms, but more flexible AI coding tools could surpass this market in the long term

Low-code player OutSystems faces valuation compression



Other low-code platforms conduct layoffs



AI copilots supercharge developer productivity

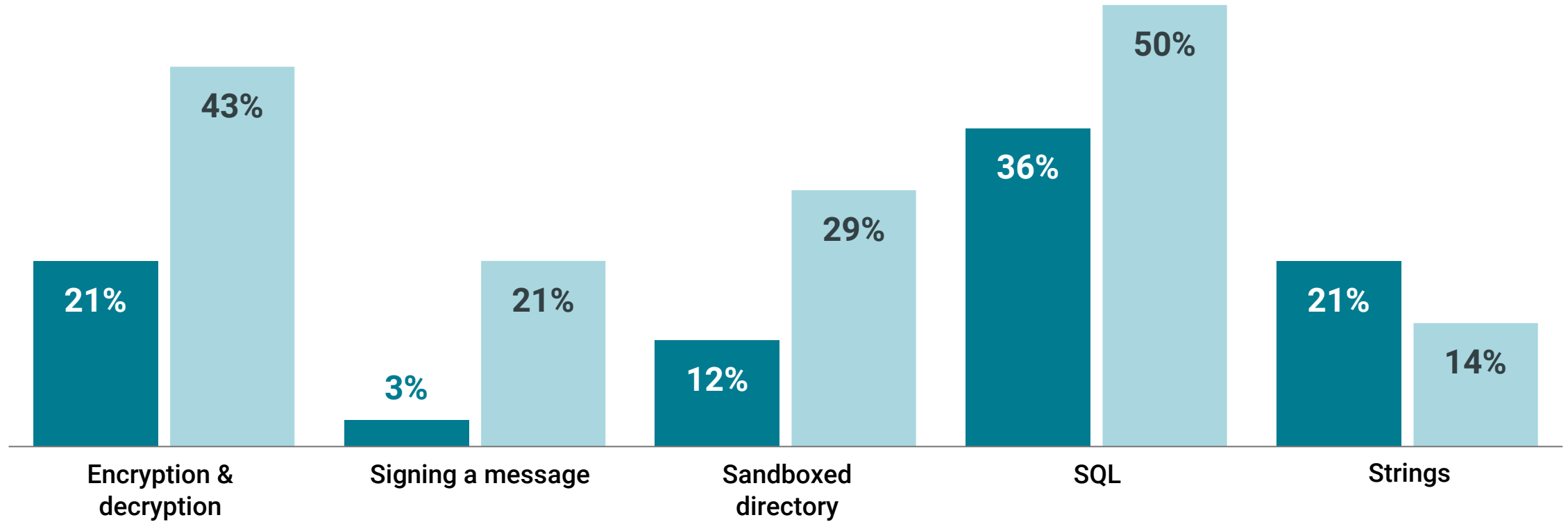
A flurry of code generation tools has emerged

Company/product	Status
 GitHub Copilot	Released by Microsoft (10/29/2021)
 ChatGPT	Released by OpenAI (11/30/2022)
code llama	Released by Meta (8/24/2023)
StableCode by stability.ai	Released (8/8/2023)
 starcoder	Released by Hugging Face & ServiceNow (5/4/2023)
 CodeWhisperer	Released (4/13/2023)
 replit AI	Released widely (10/9/2023)
 tabnine	Private (founded 2017)
 warp	Private (founded 2020)

Enterprises will be on guard against confidential code leakage, security vulnerabilities in AI-written code

Percentage of coders submitting secure answers to coding questions

■ Using AI ■ Not using AI



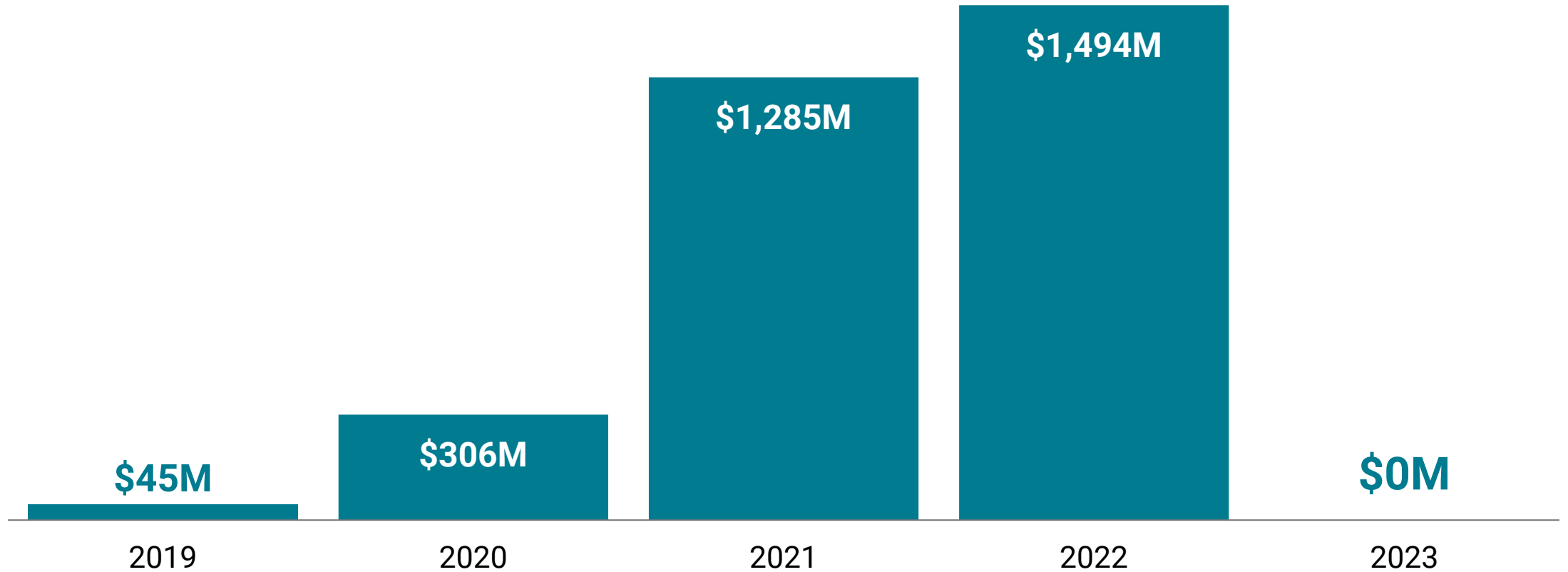
Enterprise

Global employment & payroll market shakes out



Funding for global employment startups went to zero in 2023

10 leading startups* raised over \$2B in equity funding from 2021 to 2022



Demand for remote talent jumpstarted the market, but slowdown in tech hiring will cramp players



“Given the current context, though, I don't know what their traction looks like, but **in the startup world, hiring is slowing down in the US and Europe. And my guess is that it's probably impacting them at some point. On our side, we have frozen hiring in most of our countries.** So we have not been opening new Remote.com contracts since probably April 2022. So it will be important for them to remain competitive on pricing.”

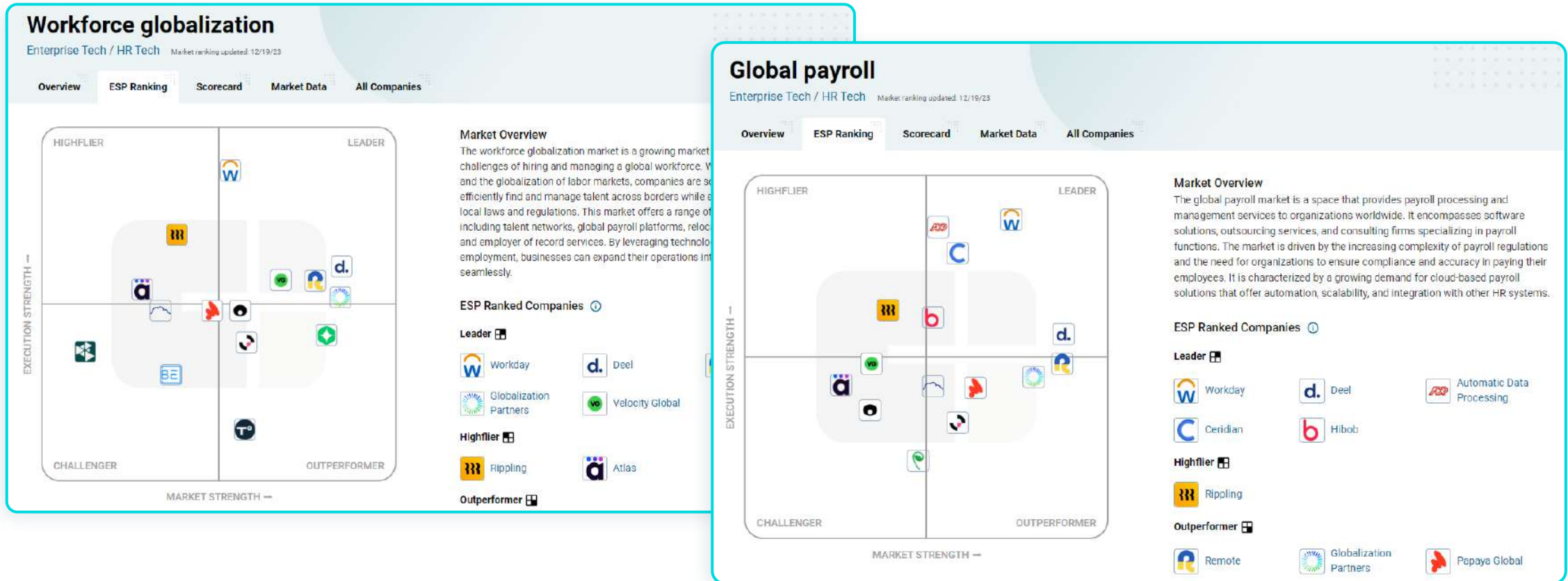
Remote customer
Chief of Staff, \$1B+ valuation online marketplace

Meanwhile competition continues to heat up as HR startups & incumbents expand their international offerings

Company	Valuation	Description	Development
 RIPPLING	\$11.3B (March 2023)	Employee management platform	Expanded into global employment & payroll (October 2022); business expected to generate \$40M in ARR in 2023
	\$97B (market cap as of January 2024)	HR management software	ADP GlobalView payroll solution expanded into 5 new markets (July 2023)
	\$10B (August 2021)	Payroll & HR solutions platform	Launched Gusto Global powered by Remote (June 2023)
	\$10.6B (market cap as of January 2024)	HR management software	Ceridian Dayforce available across most of the Middle East and Africa (August 2023)
	N/A	HR & workforce management solutions	Acquired global payroll provider Immedis (June 2023)

With capital tight and larger players looming, players will have to look for scale and efficiencies

We predict that consolidation is approaching the workforce globalization space



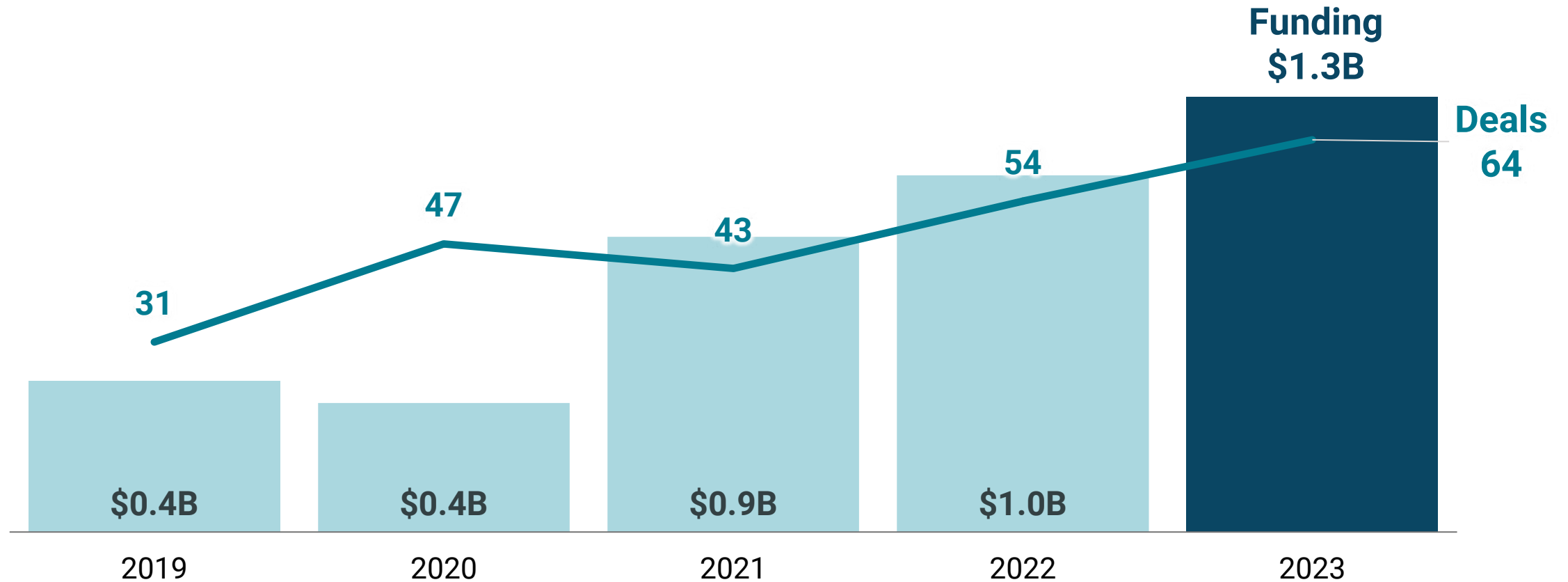
Enterprise

Quantum computing advances hint at faster commercialization



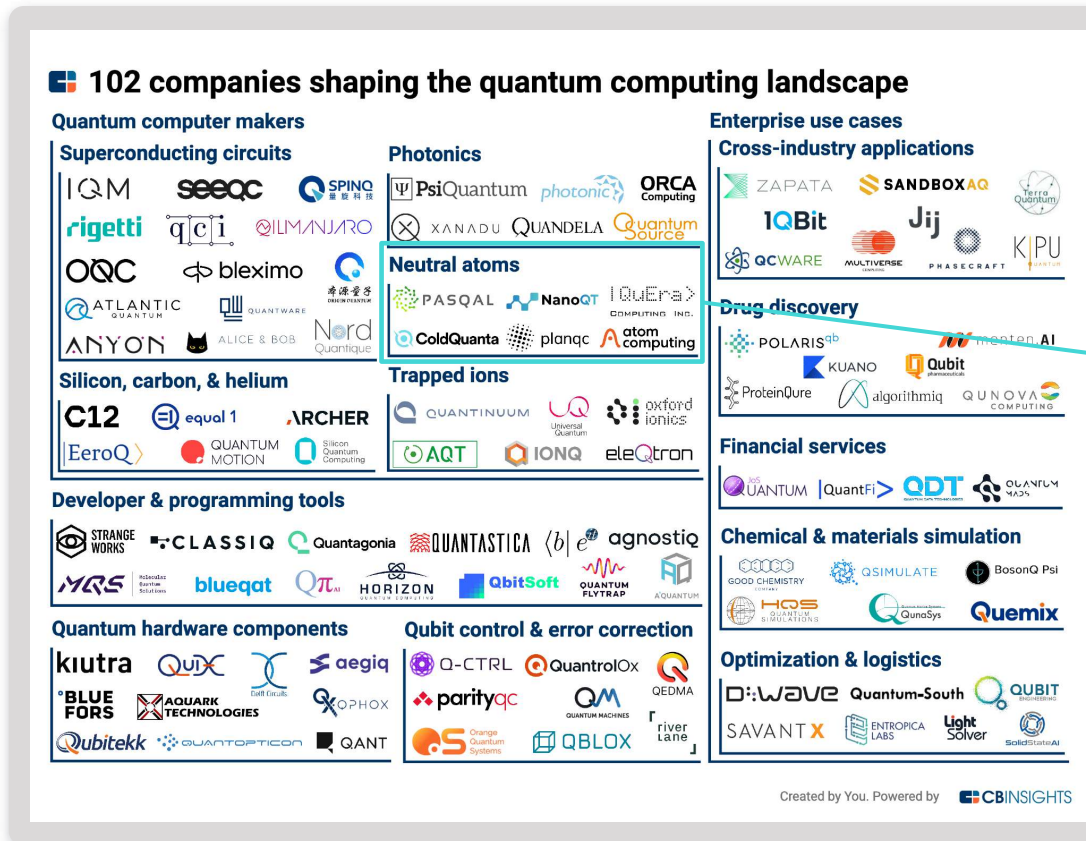
Quantum computing funding surged to a record high in 2023, bucking the broader venture downturn for 2 years in a row

Disclosed equity funding to quantum computing companies



Neutral atom quantum computers are having a breakout moment, hinting at accelerated timelines for commercialization

Atom Computing passed 1,000 qubits and QuEra announced an error correction milestone



More enterprises are running pilots with quantum startups



“We worked together on developing and deploying tests for the algorithm they coded for us. We are currently waiting for testing and scaling up the proof of concept to **bring the algorithm from the test environment to the exercise environment.**”

Qilimanjaro customer
Manager, Global transport company



“We **received a solution for benchmarking a specific [optimization] problem class,** which is relevant to the problems we have in our company for benchmarking quantum algorithms. This gave us a working code base that we could use.”

Entropica Labs customer
Analyst, Fortune Global 500 company

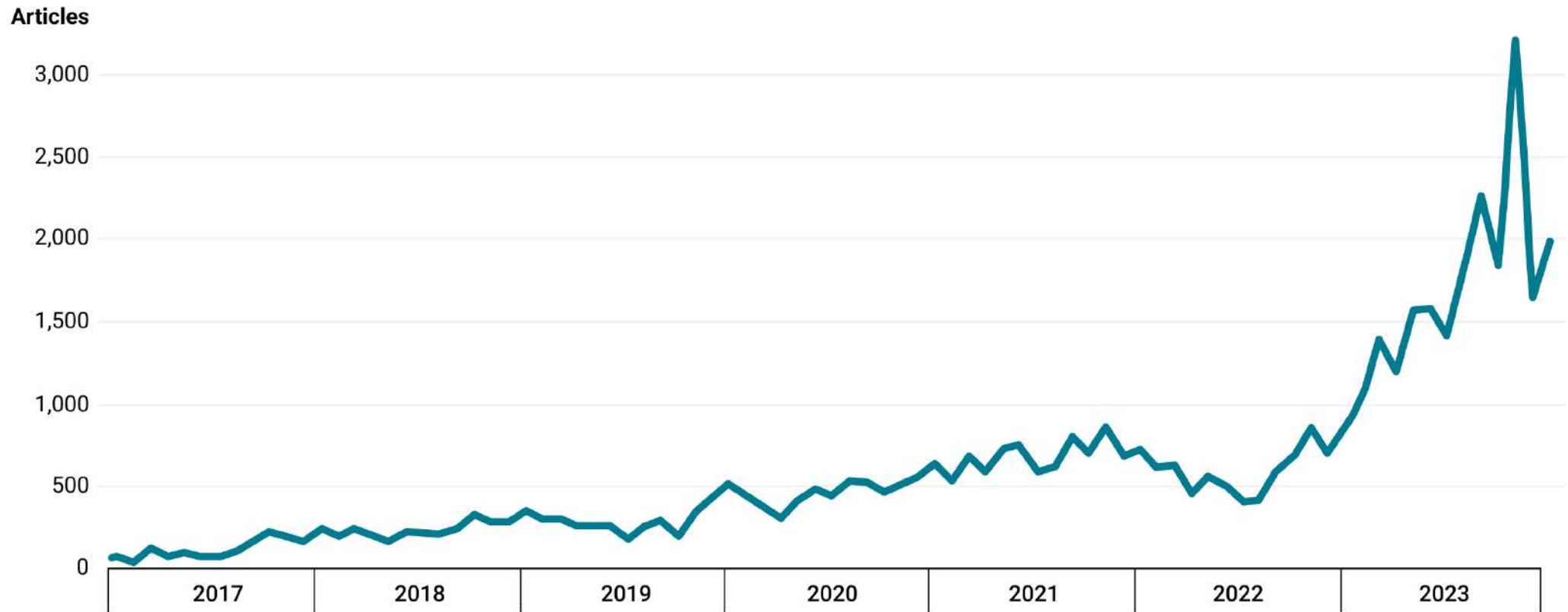


“It had experts in finance and was interested in quantum-inspired techniques, which we **see great potential in for the short term [...]** We are still analyzing the impact of the result of this work, but we **expect that it will decrease the time and cost associated with solving certain problems.**”

Multiverse Computing customer
Senior Analyst, Fortune Global 500 company

Interest in the intersection between quantum computing and AI is heating up as quantum advances tease more powerful AI models down the road

Number of media articles mentioning both quantum computing and AI



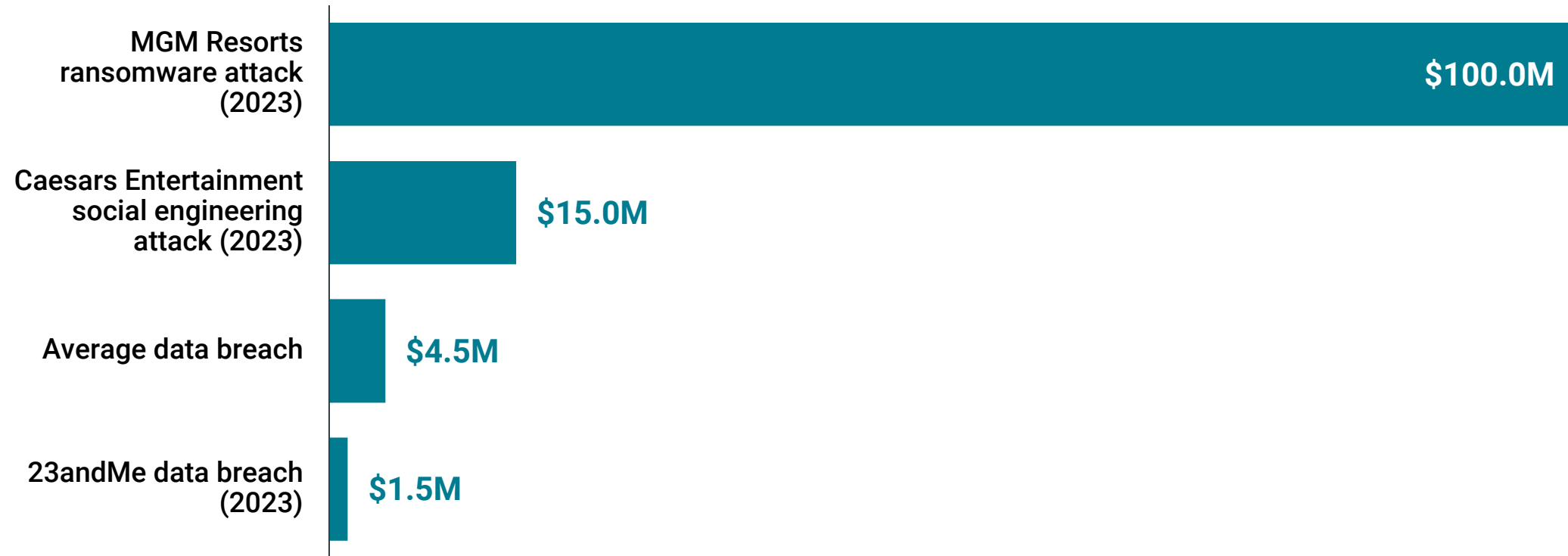
Cybersecurity

Cyber chaos drives security consolidation



Cyber crimes have massive financial consequences

The largest threats drive losses of \$100M+, while the average cost of a data breach has grown 15% in the last 3 years



And bad actors are getting smarter – and busier – by the day



Attack attempts more than doubled in 2023

↑ 104%

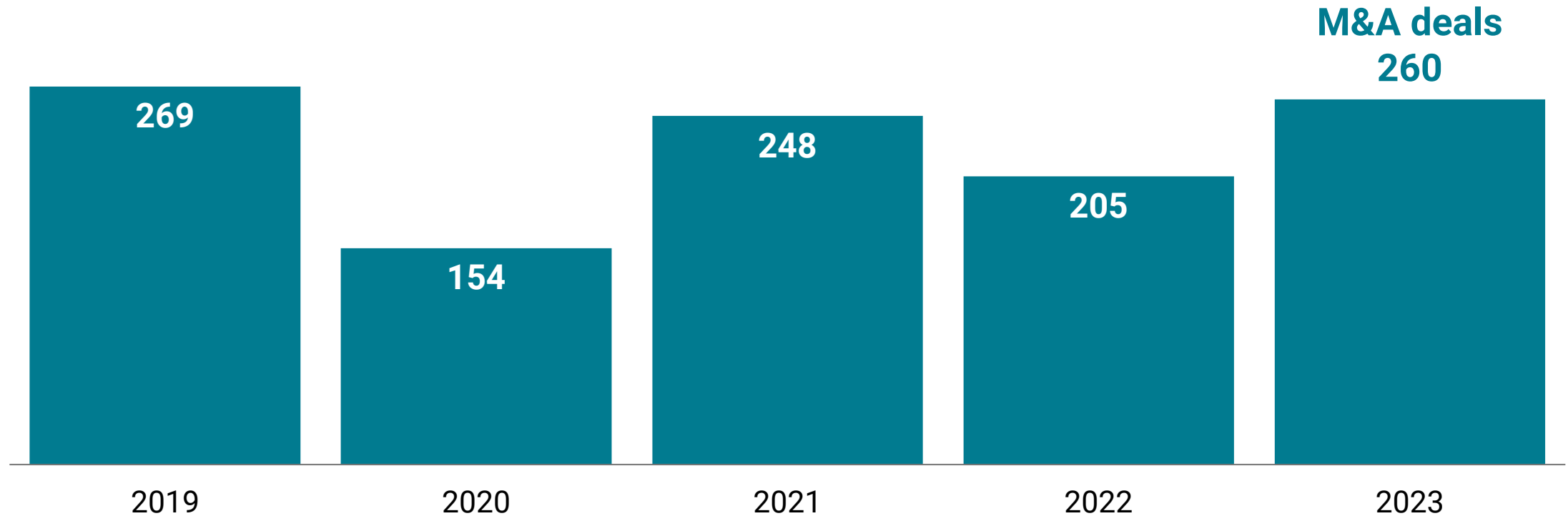
CROWDSTRIKE

"From an adversarial perspective, we expect that **the adoption of LLMs will lower the barrier of entry for malicious actors to create sophisticated cyber attacks**. Generative AI is expected to make it even easier for less advanced attackers to crack nation-state-caliber campaigns."

CEO George Kurtz, Q2'23 earnings call












To keep up with an evolving attack surface, cybersecurity leaders snap up competitors

Cybersecurity sector sees steady consolidation, with a surge in M&A deals in 2023













Cybersecurity leaders have been on an M&A tear

Top strategic acquirers by # of cybersecurity acquisitions since 2022

Acquirer	Cybersecurity acquisitions	Select acquisition targets
1 	7	 
2 	4	 
3 	3	 
3 	3	 
3 	3	 
3 	3	 
3 	3	 
3 	3	 

Who's next to get acquired?

Strong early-stage cyber startups with incumbent backing could get scooped up

Company	Mosaic score* (out of 1,000)	Latest funding round	Application	Select cybersecurity investors
 OLERIA™	780	\$33M Series A (December 2023)	Identity & access management	
 Gem	760	\$23M Series A (September 2023)	Cloud detection & response	 
 silk.	710	\$13M seed (August 2023)	Cyber risk visibility	
 aembit	710	Undisclosed seed (October 2023)	Identity & access management	 

But do customers like the all-in-one approach?



“...we are a little bit concerned about the **acquisition of Splunk by Cisco** and what that will mean for the future of the product. **We're uncertain if Cisco will invest in research and development to ensure that it continues to be the best solution in the market.**”

Splunk customer
VP, Publicly traded automobile manufacturer



“...even though Palo has been on the acquisition spree, the integration piece natively in the back-end has not fully completed yet. It has gotten better in the last few years, but I wouldn't say it is seamless as of yet. **The synergy piece...is still not there.**”

Palo Alto Networks customer
CISO, Global engineering firm



“We considered Mimecast's CyberGraph, but **the integration with the core Mimecast platform...was weak due to it being an acquisition. It wasn't a cohesive product...** We ultimately chose to look elsewhere and found Abnormal.”

Abnormal customer
Director, Personal injury law firm

In some cases, verticalization wins out



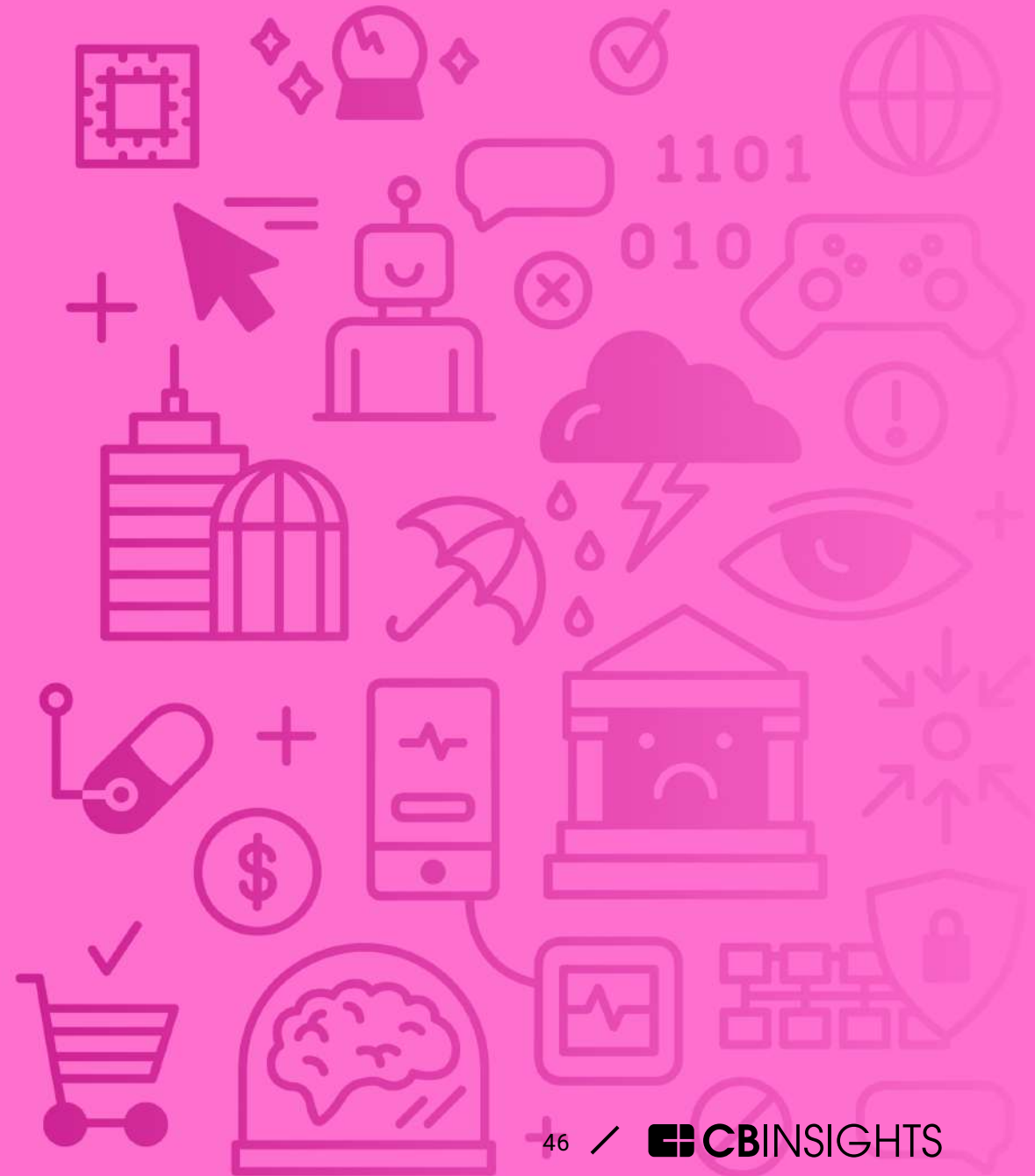
“As a financial services organization, our company had specific requirements for a product or solution that can integrate with multiple tech stacks, including SAP, Salesforce, Microsoft, and other vendors...

The reason why CrowdStrike stood out was that **it has more strength in the banking and financial services industry** than Palo Alto, Cisco, or Juniper.”

CrowdStrike customer
VP, Financial services company

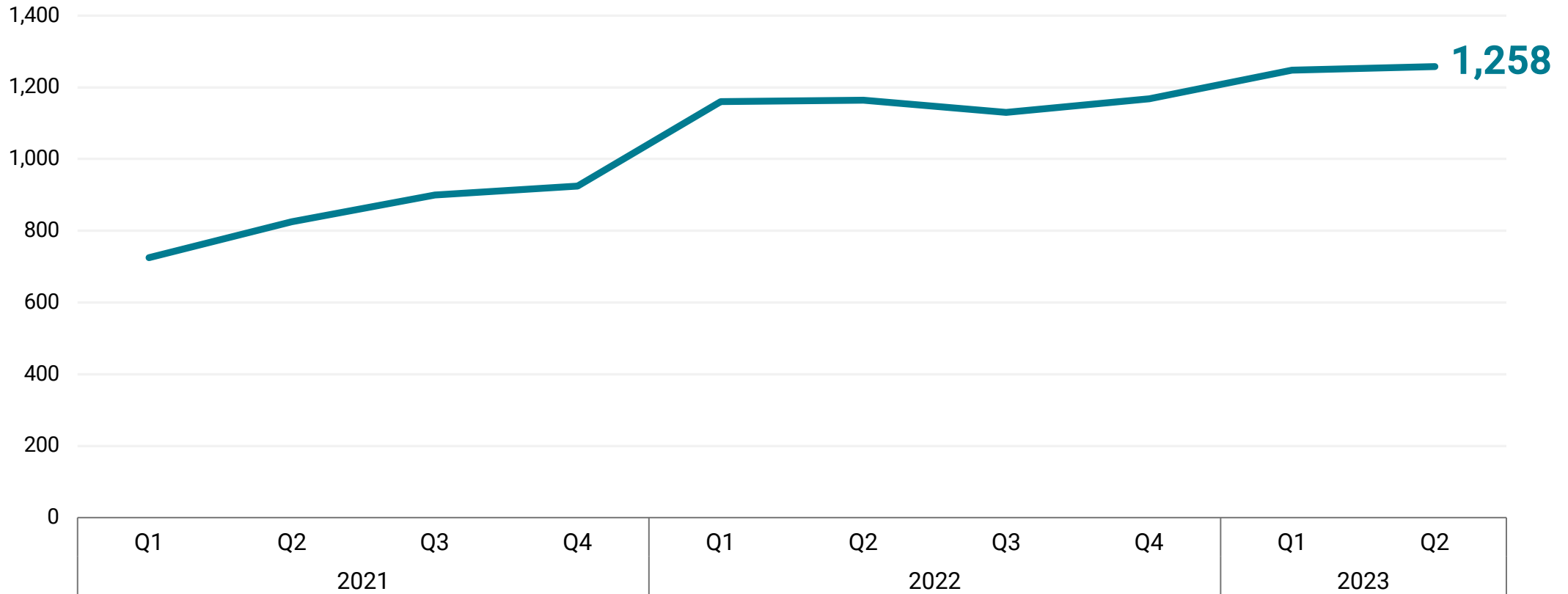
Cybersecurity

AI vs. AI dogfights redefine data security



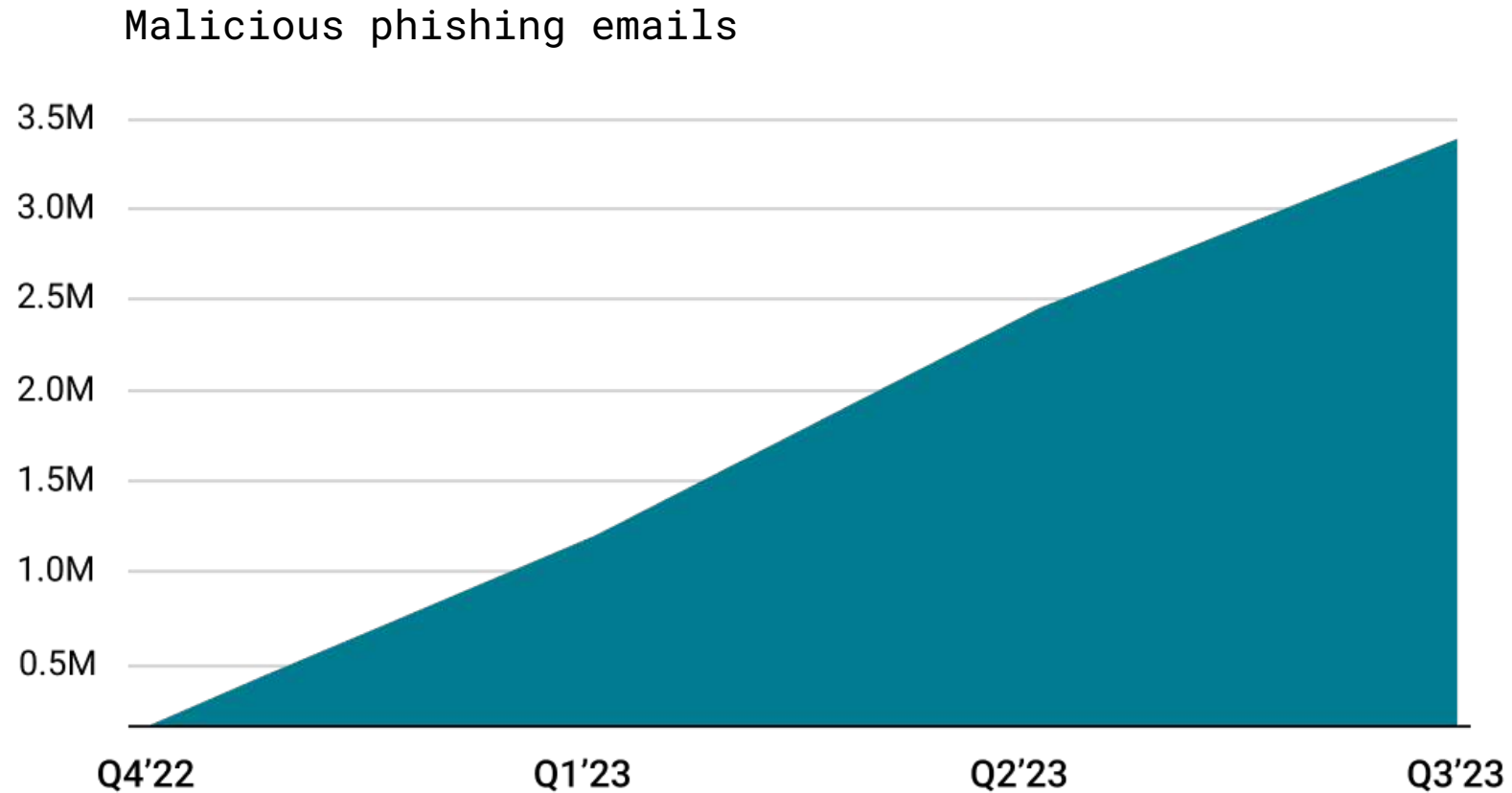
Cyber attacks continue to rise, with AI a driving force

Global average weekly cyber attacks per organization hit an all-time peak in Q2'23



ChatGPT drives an explosion of email phishing attacks

One email security vendor recorded a 1,256% increase in phishing emails from Q4'22 to Q3'23



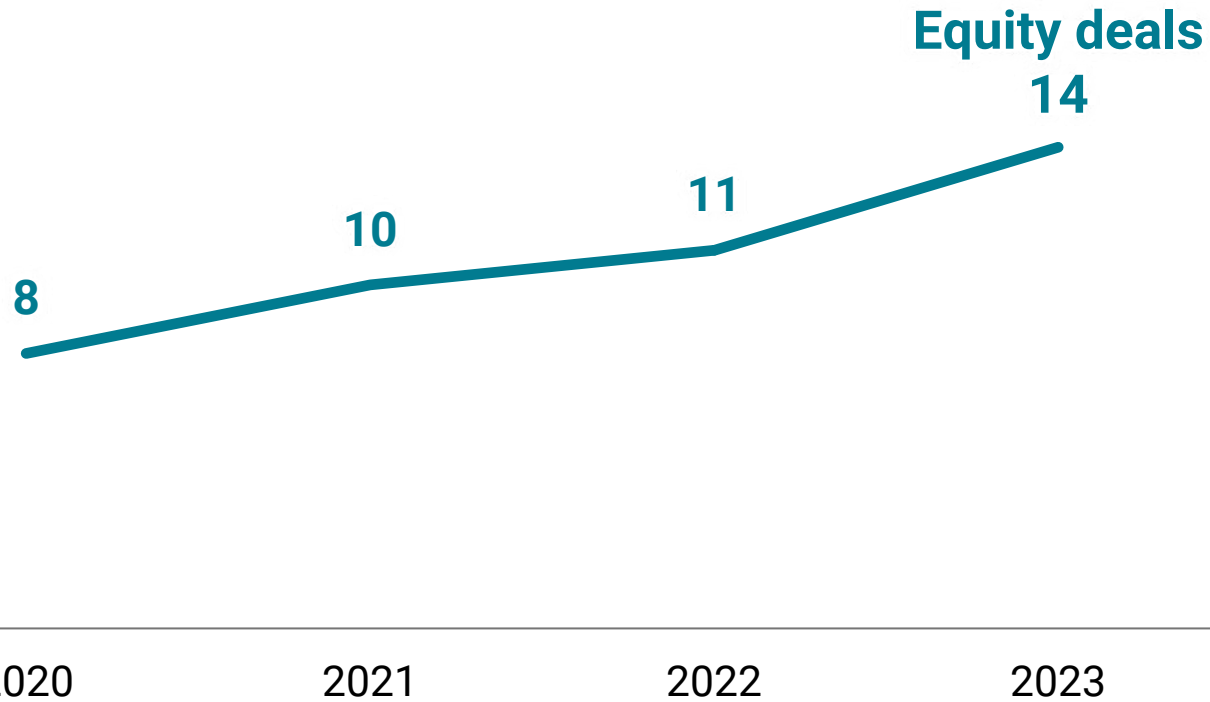
Strategic and financial (PE) acquirers go after email security startups...

Recent M&A exits and take-private transactions in the email security market




Company	Acquirer	Date	Exit	Valuation
 TESSIAN	proofpoint.	10/30/2023	Acquired	
 Armorblox	 CISCO	06/01/2023	Acquired	
KnowBe4	 VISTA	02/01/2023	Take Private	\$4.2B
 MAILINBLACK	Apax PARTNERS	09/12/2022	Acq - Fin	
mimecast	 PERMIRA	05/19/2022	Acq - P2P	\$5.8B
 Barracuda	KKR	04/12/2022	Acq - Fin	
 AREA 1	 CLOUDFLARE	04/01/2022	Acquired	\$162M
 PHISHLABS	FORTRA	10/19/2021	Acquired	
proofpoint.	 THOMABRAVO	08/31/2021	Take Private	\$12.3B
 AVANAN	 CHECK POINT	08/30/2021	Acquired	\$280M

...While investors pile into the breach & attack simulation market

The largely early-stage space has seen rising investor interest, as more startups use generative AI to emulate threats



Select early-stage deals in 2023

Company	Amount Round
 Jericho Security	\$5M Pre-seed
 BRIGHTSIDE AI	\$1M Seed
 ASants 矢安科技	Undisclosed Seed

GenAI could be a major boon for cyber attack prevention



“SlashNext is working on a generative AI-based solution, which means it will generate its own kind of phishing and malware and it will train the software to automatically be aware of any new kind of threats arriving in the market... That is a differentiator from the technology perspective.”

SlashNext customer
Senior Design Engineer, Fortune 500 company

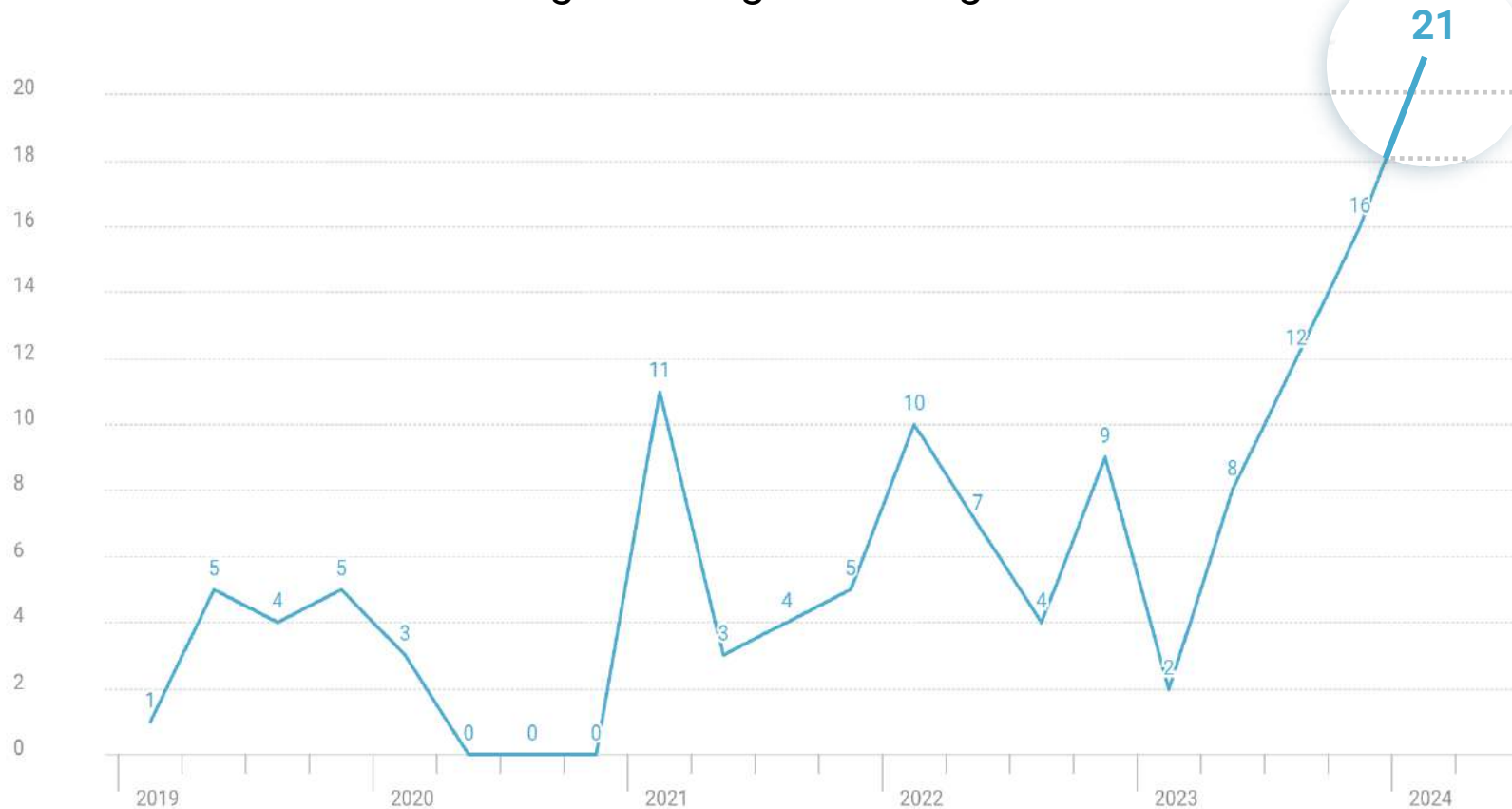
Financial services & insurance

Banks get AI FOMO






AI is the talk of the town in banking

Just 1 month into Q1'24, mentions of AI and related terms on earnings calls hit record high among 10 largest US banks



Who talks about AI the most?

Bank	Mentions of AI since 2019
BANK OF AMERICA 	44
JPMORGAN CHASE & CO.	36
 Bank	29
	25

Source: CB Insights – [Earnings Transcripts Analytics](#) (date reflects quarter call occurred). 10 largest US banks by consolidated assets (per the Federal Reserve) are JPM Chase, Bank of America, Wells Fargo, Citibank, U.S. Bank, PNC, Goldman Sachs, Truist, Capital One, and TD Bank.

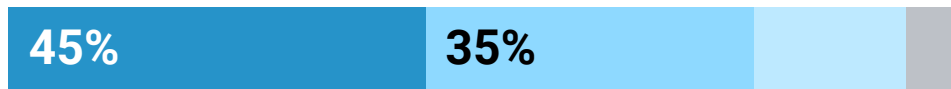
With many viewing genAI as an operational silver bullet

How valuable would implementing this use case be for your organization?

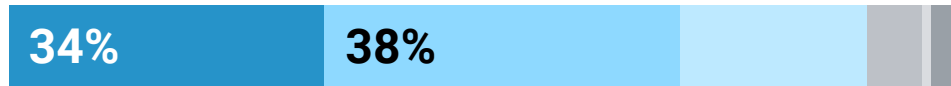
Financial document search and synthesis with genAI



Enhanced virtual assistants with genAI



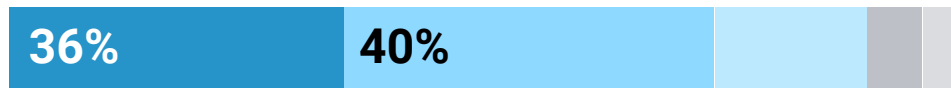
Capital markets research with genAI



Regulatory code change consultant with genAI



Personalized financial recommendations with genAI



Extremely valuable

Fairly valuable

Somewhat valuable

Not very valuable

Not valuable at all

N/A or "I don't know"

WELLS FARGO

"Consumers interacted **over 20 million times** last year with Fargo, our **AI-powered virtual assistant.**"

CEO Charles Scharf, Q1'24 earnings call

BANK OF AMERICA

"...to the extent that we can deploy [AI] wisely, ... we can always **hire a little less if we see the efficiencies coming through** and redeploy the people we have."

CEO Brian Moynihan, Q1'24 earnings call

But some banks are more prepared for the AI boom than others

The top 3 players in the CBI Retail Bank AI Readiness Index are building moats via internal R&D, IP, and key AI hires



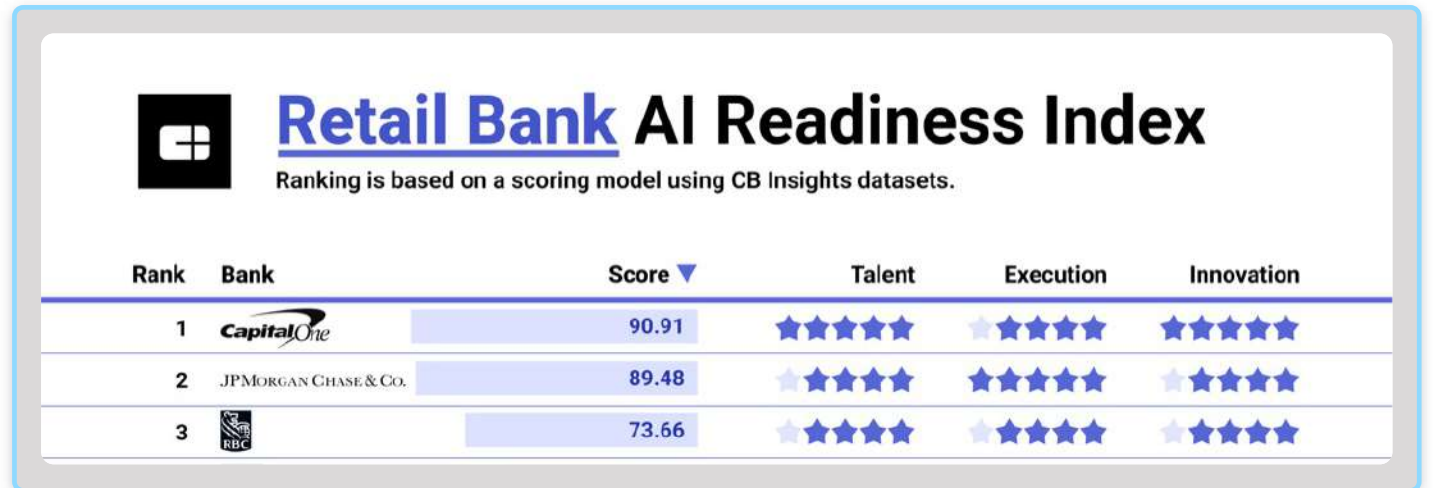
Hired [Abhijit Bose](#), a head of engineering at Facebook AI Research, to lead its enterprise machine learning department.



Has applied for [9 patents](#) since 2021 pertaining to federated learning – a privacy-preserving and decentralized AI training method.



Launched Turing text-to-SQL, a tool that converts natural language queries into SQL code, via its Borealis AI institute.














Banks will have to overcome significant challenges to realize AI's potential

The four greatest obstacles to reaching financial services orgs' AI goals



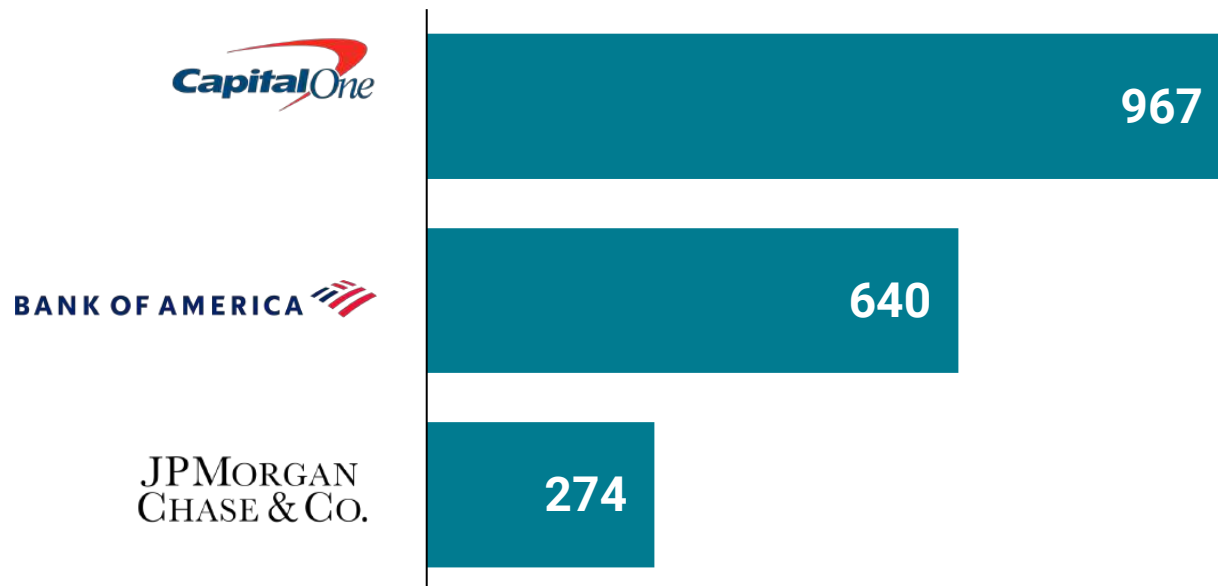
To get a foot in the door, some are linking up with AI chatbot developers

Select AI chatbot developers with investors and clients from the banking sector

AI chatbot developer	Banking investors	Banking clients
	  	  JPMORGAN CHASE & CO.
		 
		

While others double down on internal R&D and shop around for outside talent & capabilities

Among the 10 largest US banks, the top 3 AI patent filers by # of applications since 2021



Key AI acquisitions in 2023

Bank	Acquisition target	Application
JPMORGAN CHASE & CO.		AI investment insights & document extraction
	VELOCITY BLACK	AI personal assistant

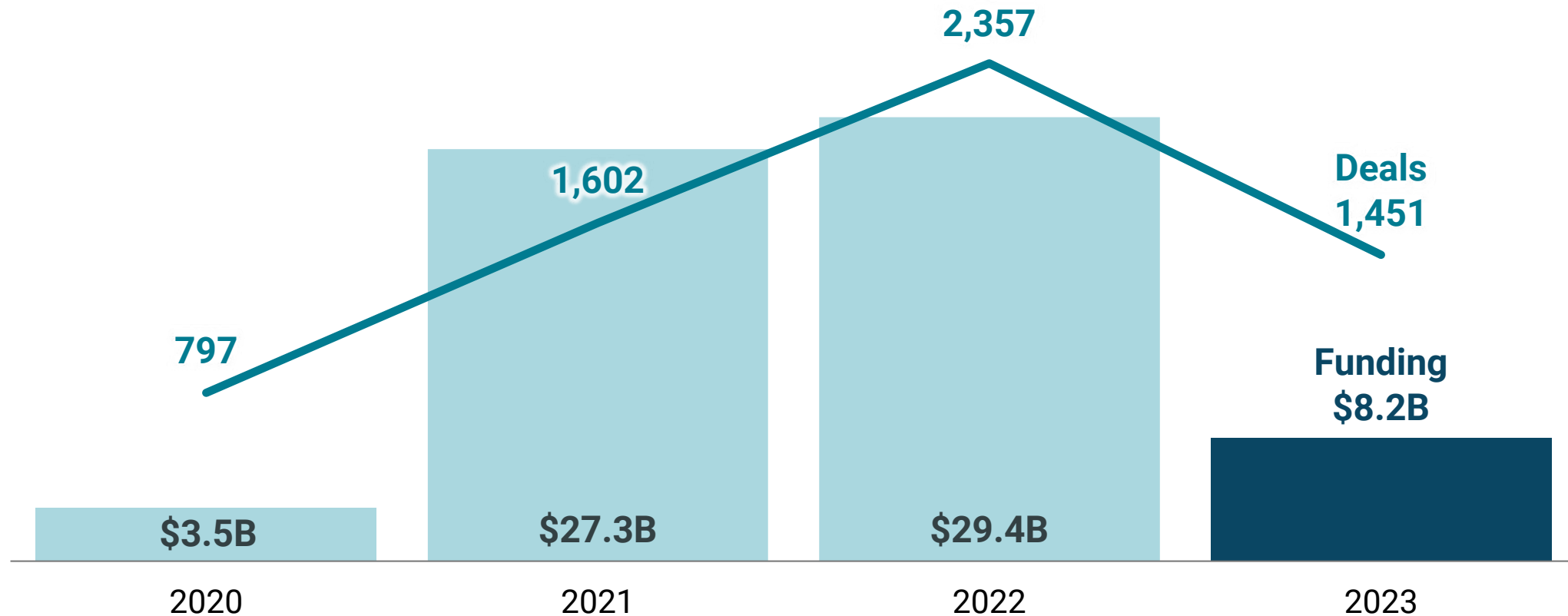
Financial services & insurance

Blockchain's uphill finserv battle



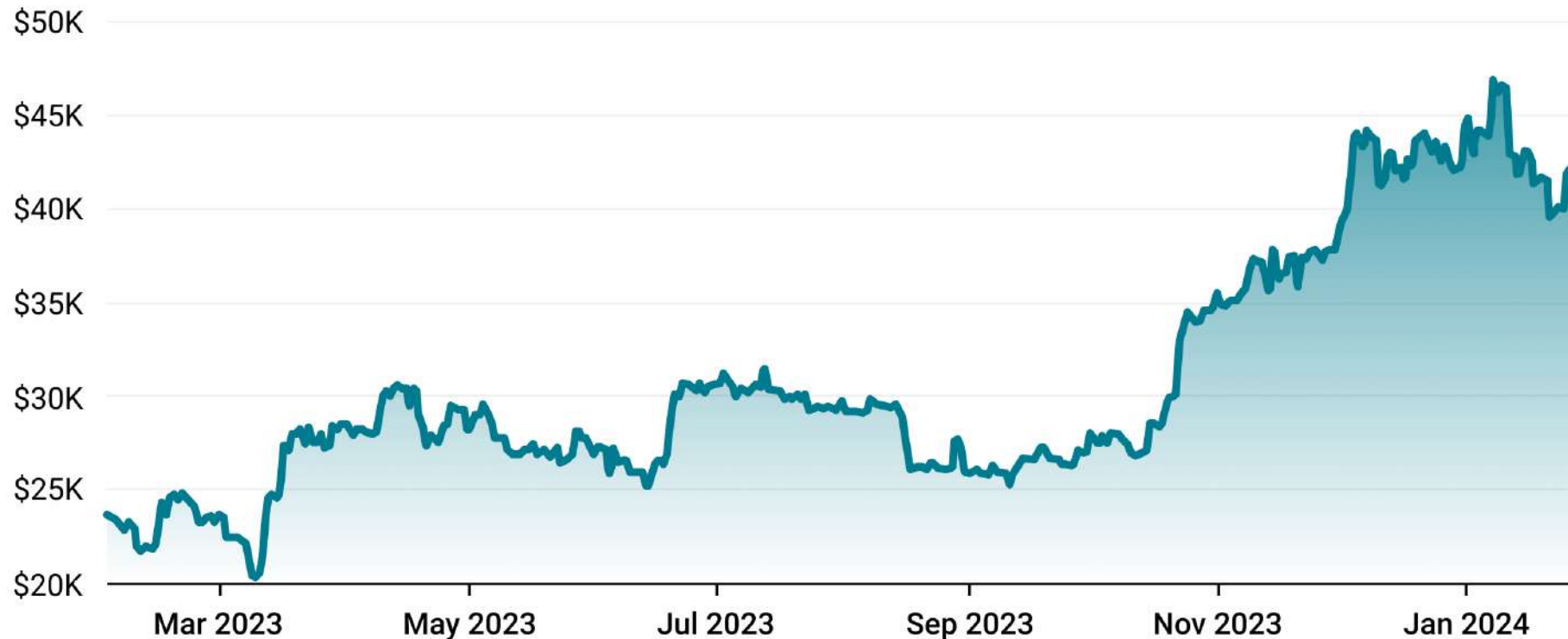
Funding to blockchain startups is in the gutter

The sector has yet to rebound following crypto blow-ups



Despite bitcoin's recent ascent, the underlying tech has yet to see significant commercial traction...

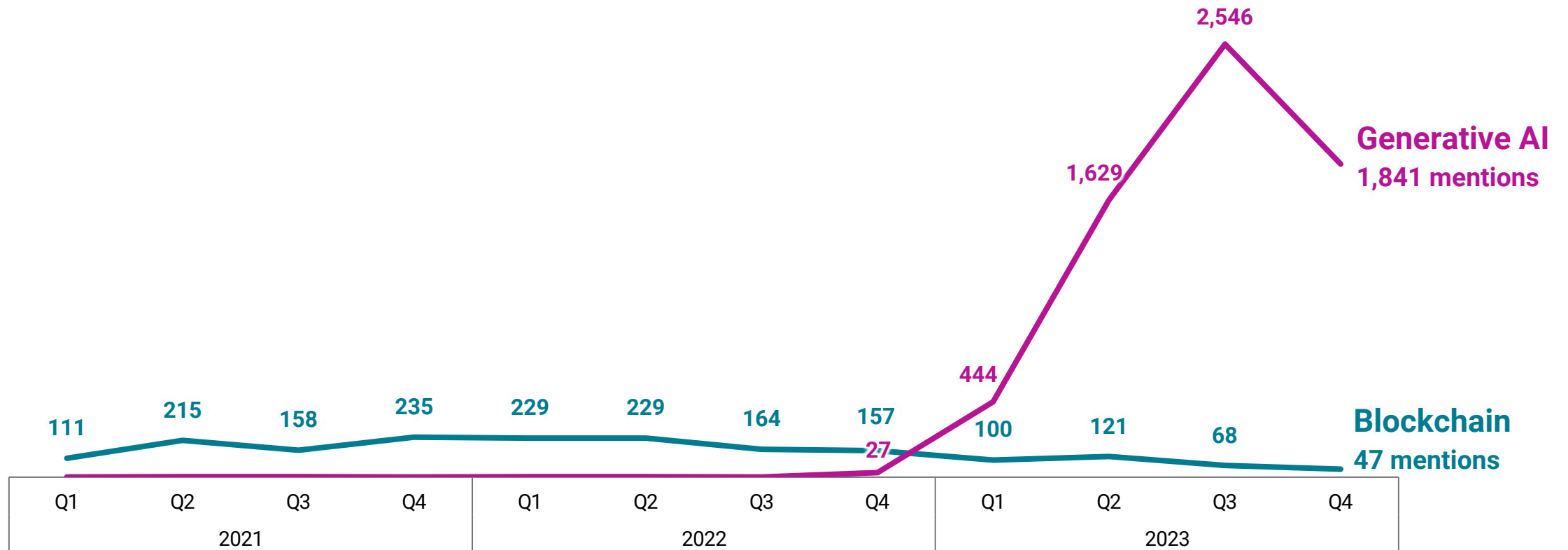
The price of BTC trending up, driven in part by recent spot bitcoin ETF approval



Source: Google Finance. Data as of February 1, 2024. Note: Spot bitcoin exchange-traded funds (ETFs) are open-end funds that allow investors to gain exposure to bitcoin without holding it, making it more accessible to everyday investors.


...as blockchain has slipped off executives' radar, paling in comparison to genAI hype

Earnings call mentions of blockchain vs. generative AI









Early blockchain experiments in banking have hit roadblocks

Major blockchain trade finance networks shut down








Entered insolvency 6/6/2022

**Joint venture
with 10+ banks including**




Entered insolvency 2/24/2023

30+ member banks including



Announced shutdown 10/27/2023

9 shareholder banks including



Financial services leaders haven't written blockchain off, but they aren't racing to deploy it either

Crypto complications continue to weigh on the sector

VISA

"In terms of...blockchain and crypto, it's, as far as we see, it's still early days, still emerging technologies. But as we've said in other venues, we see the potential for blockchain. We see the potential for stablecoins...And **we'll see how they play out in the market. And if there's things to scale, we want to be part of that.**"

CEO Ryan McInerney, Q2'23 earnings call

ADDX

"The first [weakness of this solution] is not really a weakness of ADDX, but rather a lack of understanding in the market and among clients about the difference between blockchain and crypto. Crypto is volatile and risky, whereas blockchain is simply a technology to facilitate contracts and tokenize assets. **When I tell customers that ADDX uses blockchain technology, they are sometimes confused and I have to explain further. Some are convinced, but still worried that it may be related to crypto.**"

ADDX customer
Senior Vice President, Publicly traded financial services company

The future of finserv incumbents' limited blockchain experiments will hinge on adoption & revenue

Select blockchain projects & recent announcements

J.P.Morgan

Digital token JPM Coin **processes \$1B worth of transactions a day**, though still a fraction of the \$10T processed daily by JPM (10/26/2023)

Onyx **launches JPM Coin-based programmable payments**, scales back NFT, metaverse work (11/10/2023)

citi

Launches Citi Token Services, which **converts client deposits into digital tokens to enable instant cross-border payments & automated trade finance solutions** around the clock (9/18/2023)

Swift

Successfully **pilots transferring tokenized assets across public and private blockchains** with Chainlink (8/31/2023)

HSBC

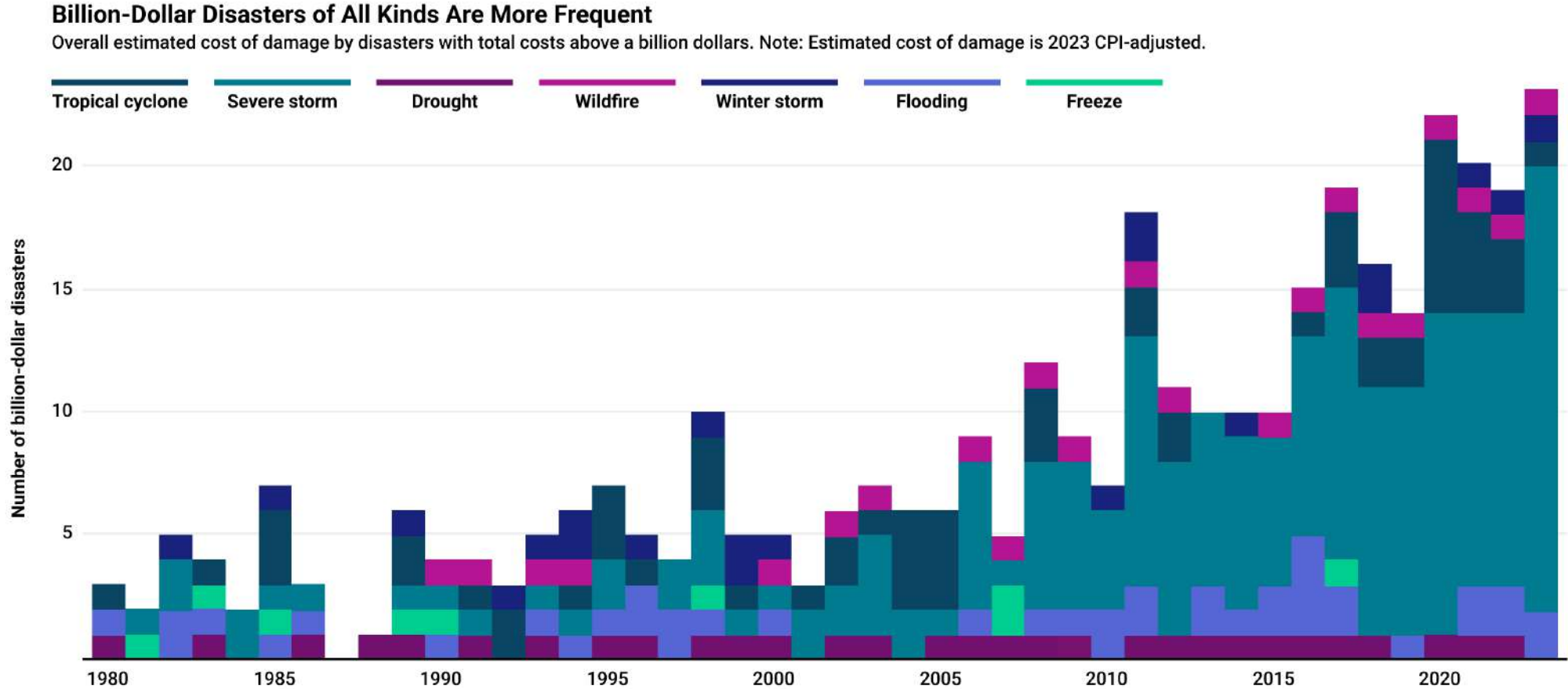
Launches platform that **tokenizes gold bars** to simplify tracking & trading (11/1/2023)

Financial services & insurance

Extreme weather is an opportunity for insurtech



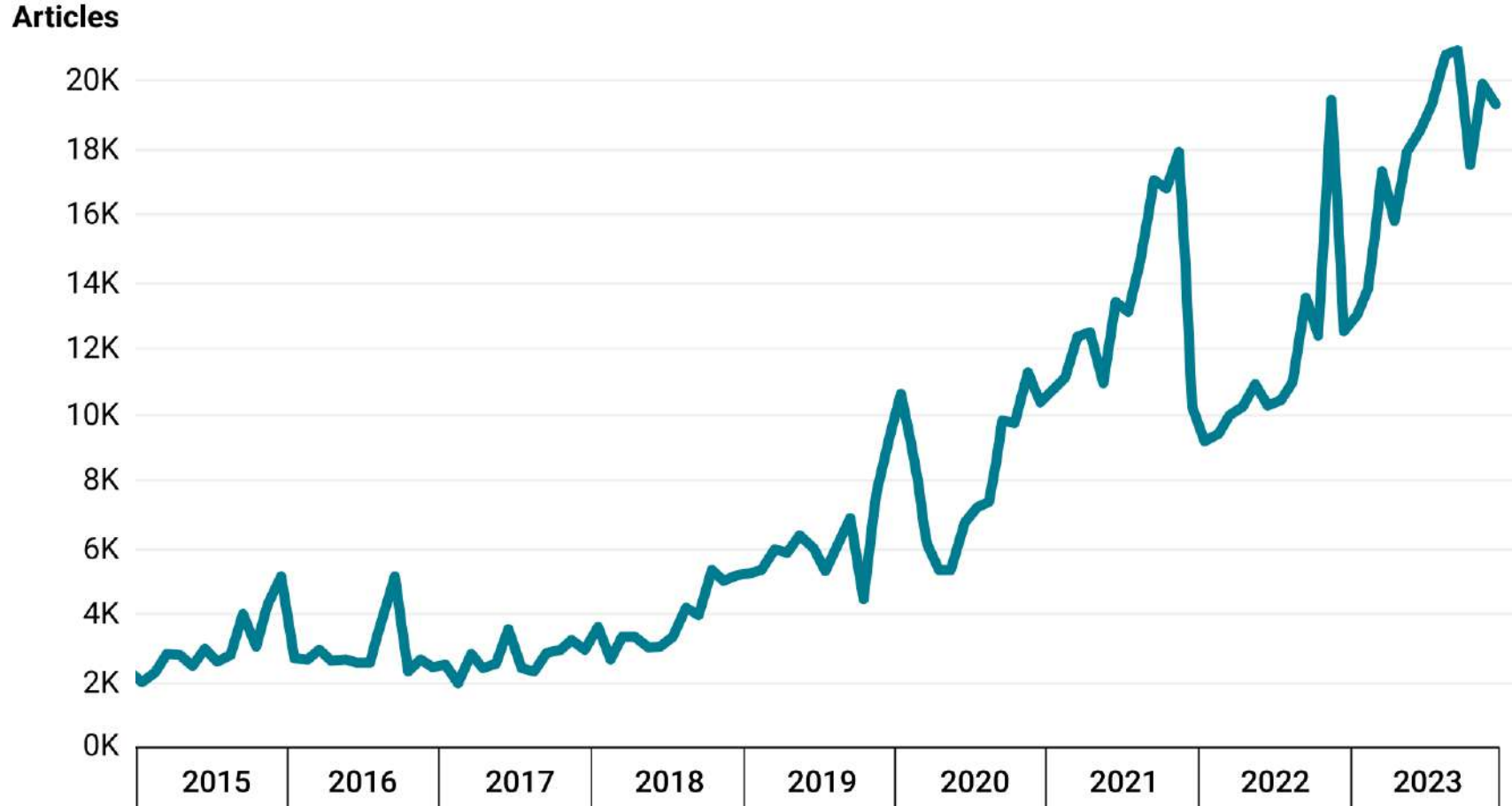
The US saw a record number of billion-dollar weather disasters in 2023



Source: National Oceanic and Atmospheric Administration via Bloomberg (data as of September 2023).

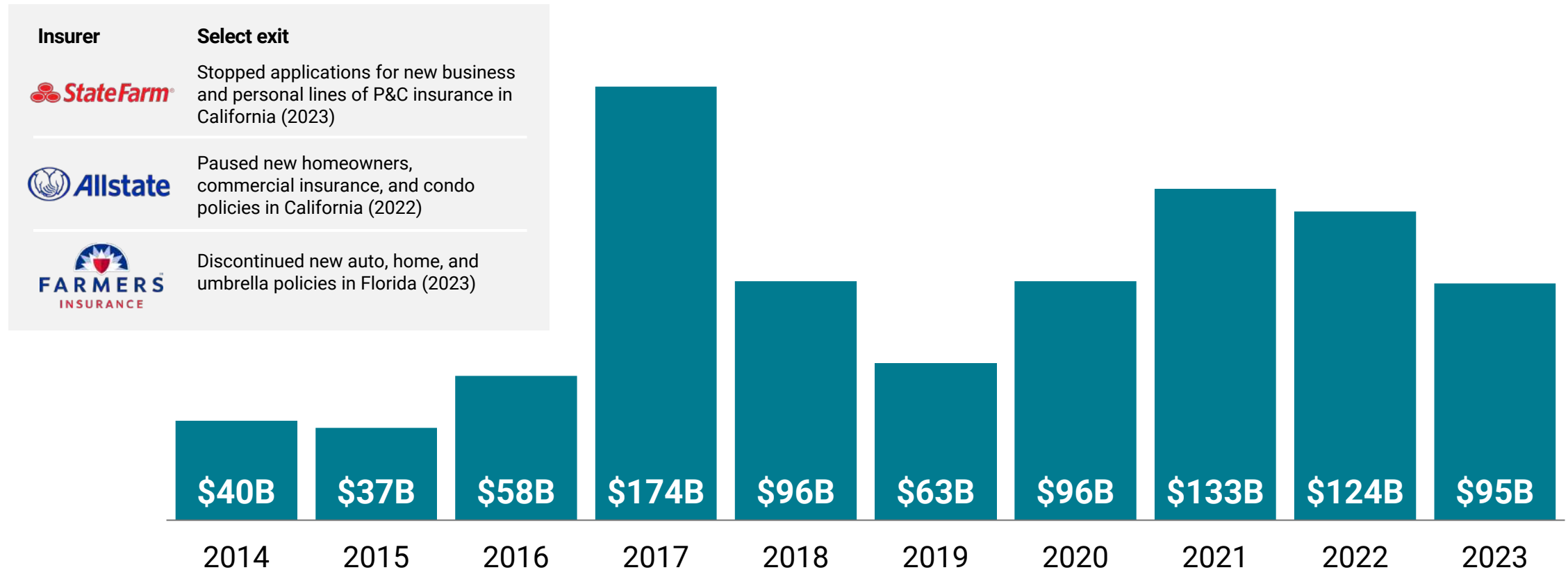
Extreme weather and climate change have gripped public attention

Number of related media articles published per month



Unpredictable and costly weather disasters see insurers exit markets, reduce coverage

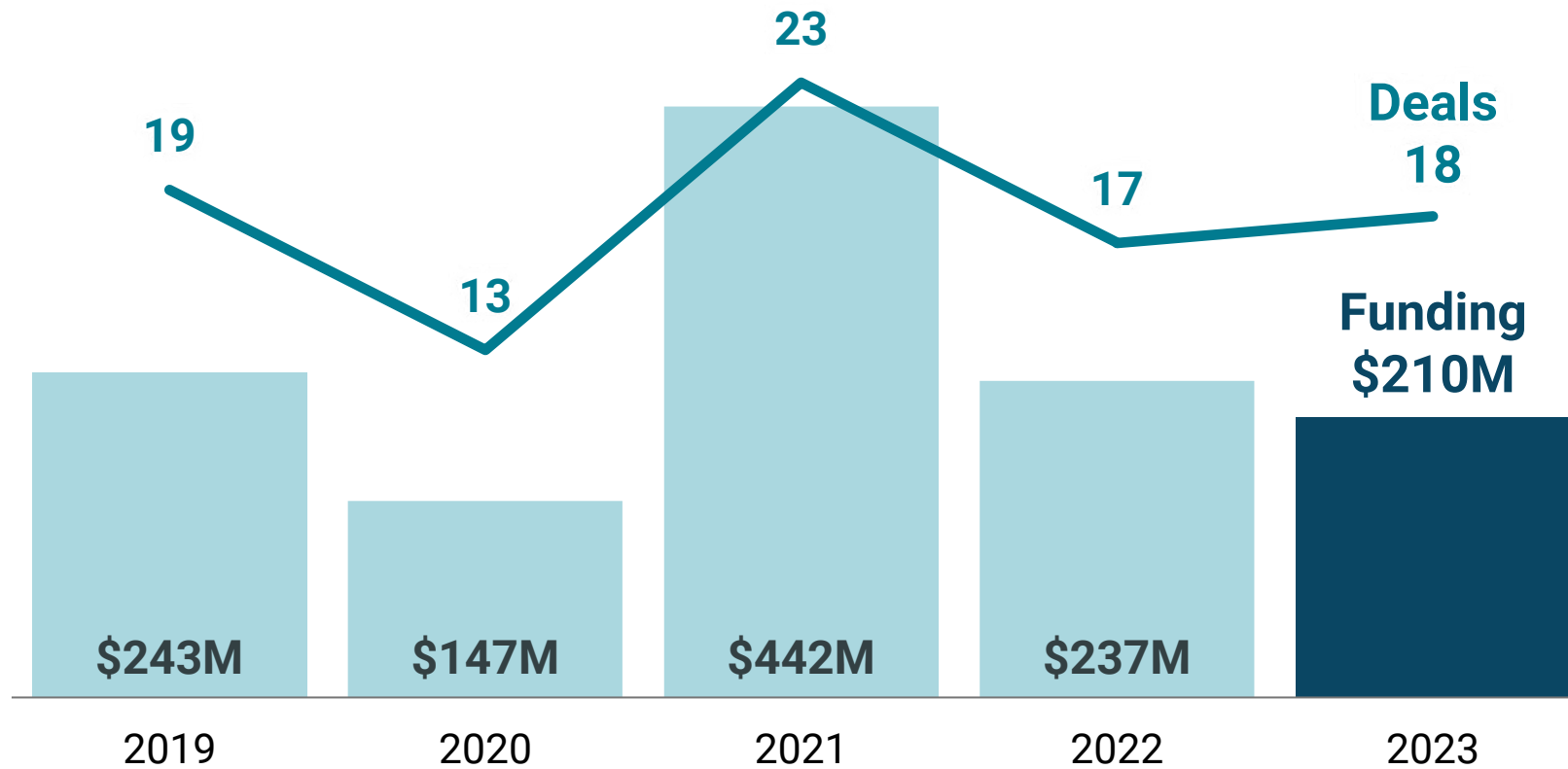
Natural disaster losses amounted to \$250B in 2023 – less than half insured (\$95B)






Source: Munich Re (adjusted to 2023 values based on local CPI) via Bloomberg; media reports.

Insurers turn to solutions for predicting and managing extreme weather risk

Funding to these solutions remains steady while dealmaking ticks up



Key early-stage deals in 2023

Company	Amount Round
 PANO	\$17M Series A
 MITIGA	\$14M Series A
 reask earth system risk	\$5M Seed

Source: CB Insights Market Reports – [Catastrophe modeling](#), [Climate and weather financial risk modeling](#), [Weather risk intelligence](#), [Wildfire risk intelligence](#), and [Flood intelligence](#).

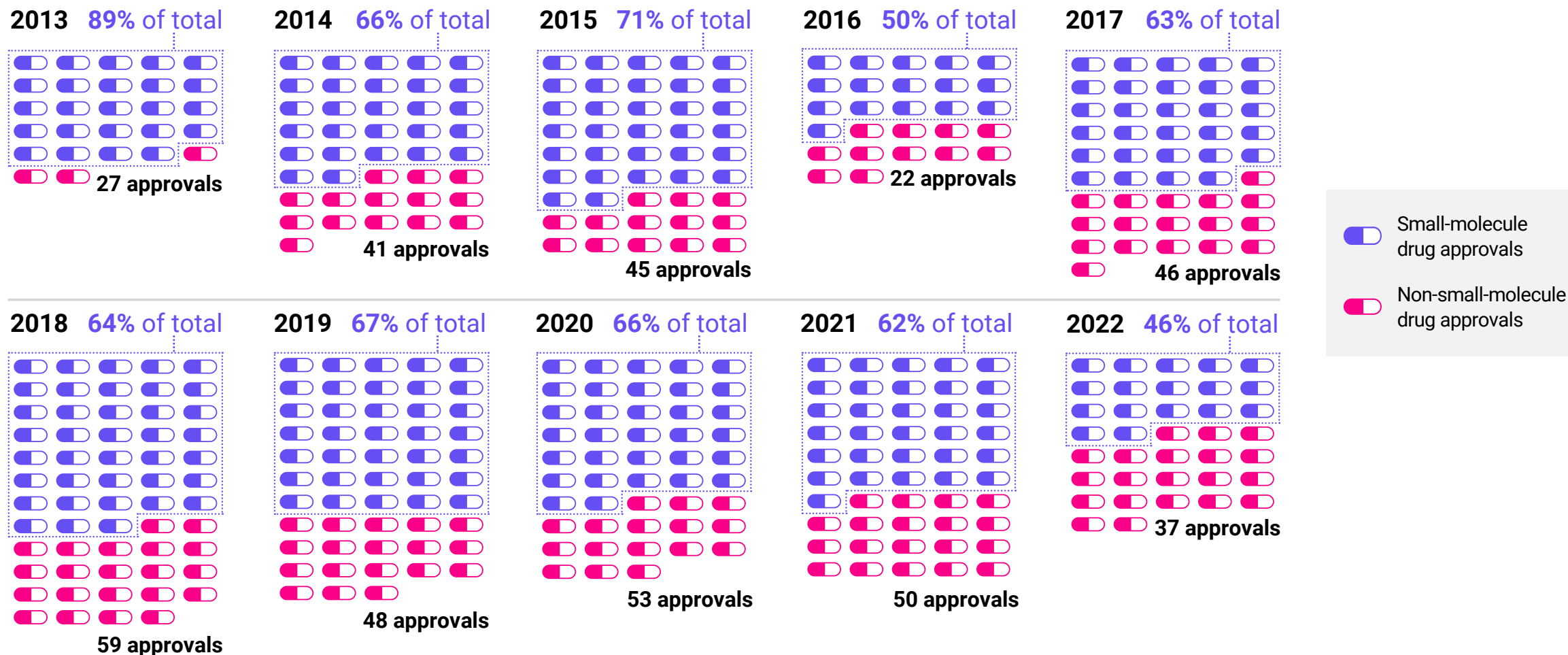
Healthcare & life sciences

The great AI drug race heats up



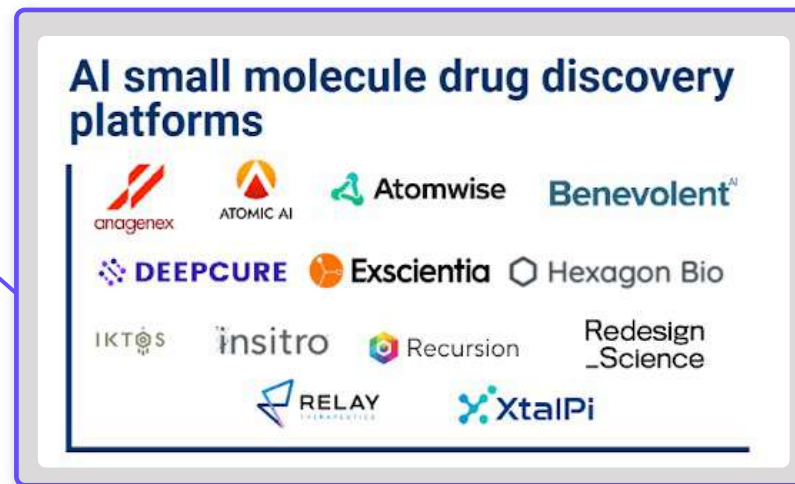
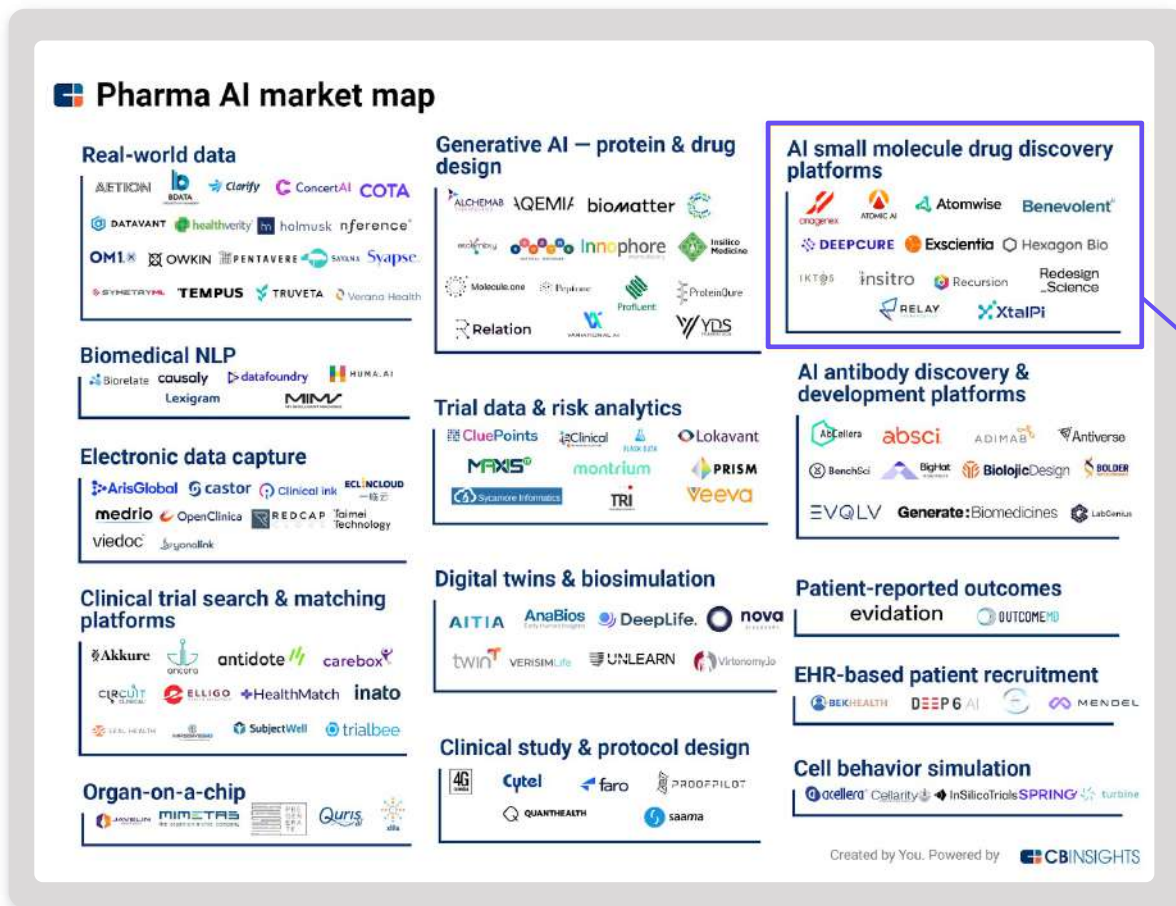
Small-molecule drugs are central to the pharmaceutical industry

From 2013 to 2022, nearly 2 in 3 drugs approved by the FDA were small-molecule



Source: US Food and Drug Administration via Chemical & Engineering News. Note: Small-molecule drugs are organic compounds with low molecular weights. They engage biological targets for therapeutic purposes, and most can be administered orally.

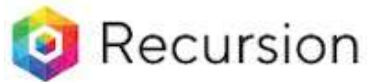
AI is disrupting the small-molecule drug development landscape



Source: CB Insights research – [Pharma AI Market Map](#). Note: This market map shows technology companies that use AI organized by market. It is not intended to be exhaustive of companies in the space, and categories are not mutually exclusive.

AI is boosting the speed and precision of small-molecule drug discovery

Select win reasons for leading players in the space



9.2 /10 ⓘ

Leader

Integrates machine learning with complex biology to enhance drug discovery efficiency and accuracy.



8.8 /10

Highflier

Utilizes a leading biopharma AI platform to accelerate drug target selection and development in complex diseases like cancer.



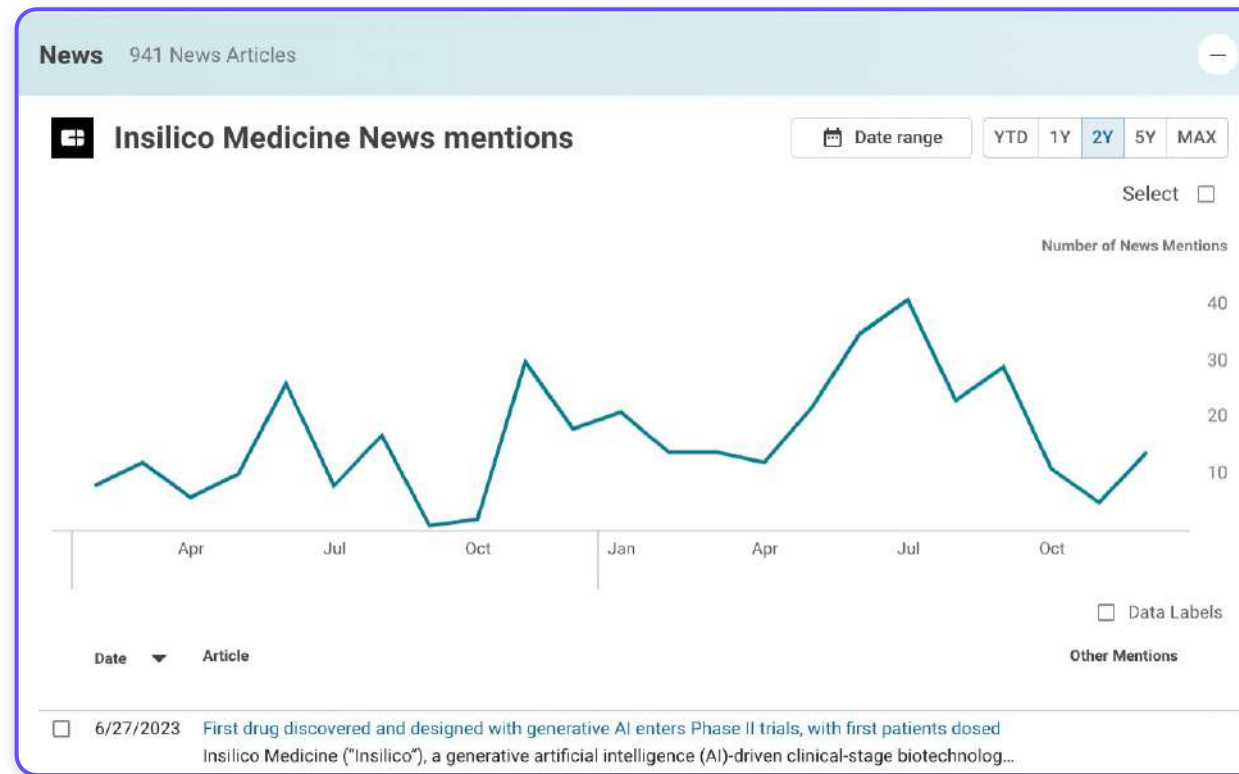
8.7 /10

Highflier

Integrates AI for both target identification and chemistry, enhancing drug discovery precision.

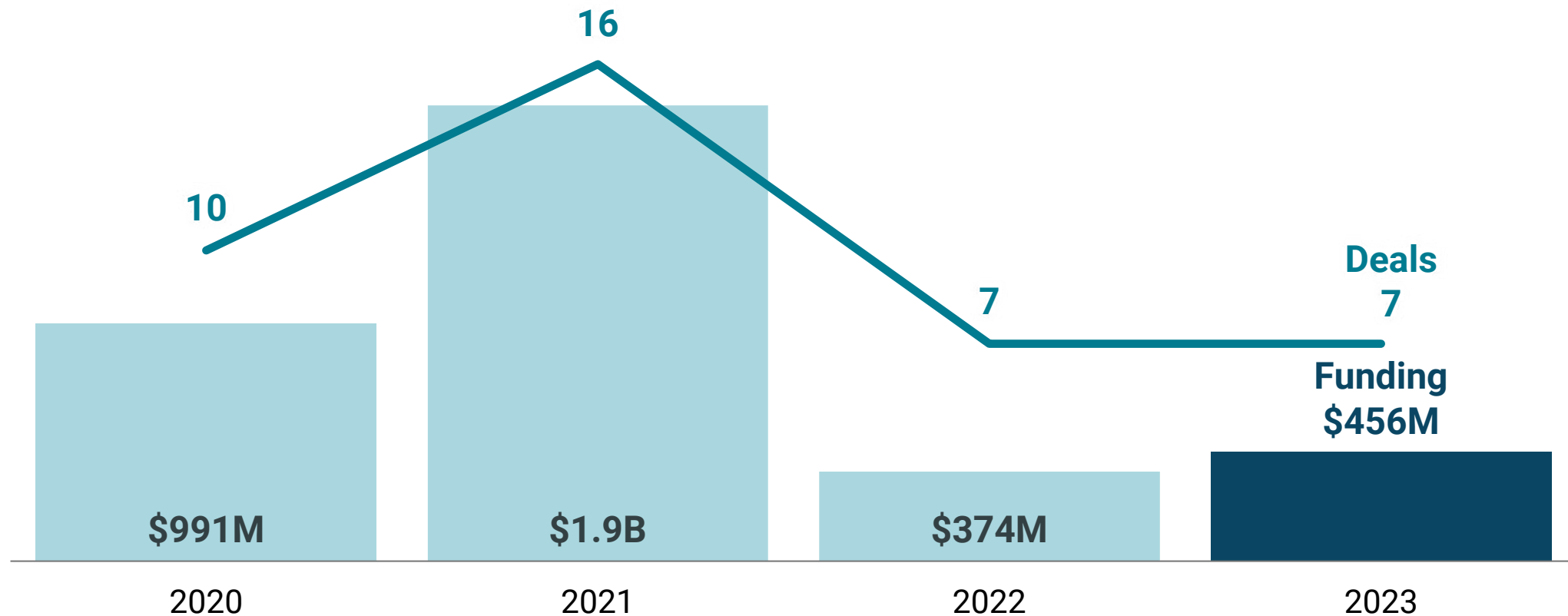
The race for the first AI-discovered drug is picking up rapidly, with candidates approaching late-stage trials

All eyes were on Insilico Medicine as it entered the first fully AI-generated small-molecule drug into Phase II clinical trials in June 2023



Venture activity in AI small molecule drug discovery holds strong heading into 2024

Equity funding ticked up while deal count held steady in 2023, bucking the broader venture slowdown



Pharma incumbents will continue to work with these companies to get ahead

The top 3 players in the CBI Pharma AI Readiness Index have all linked up with AI-focused drug discovery startups



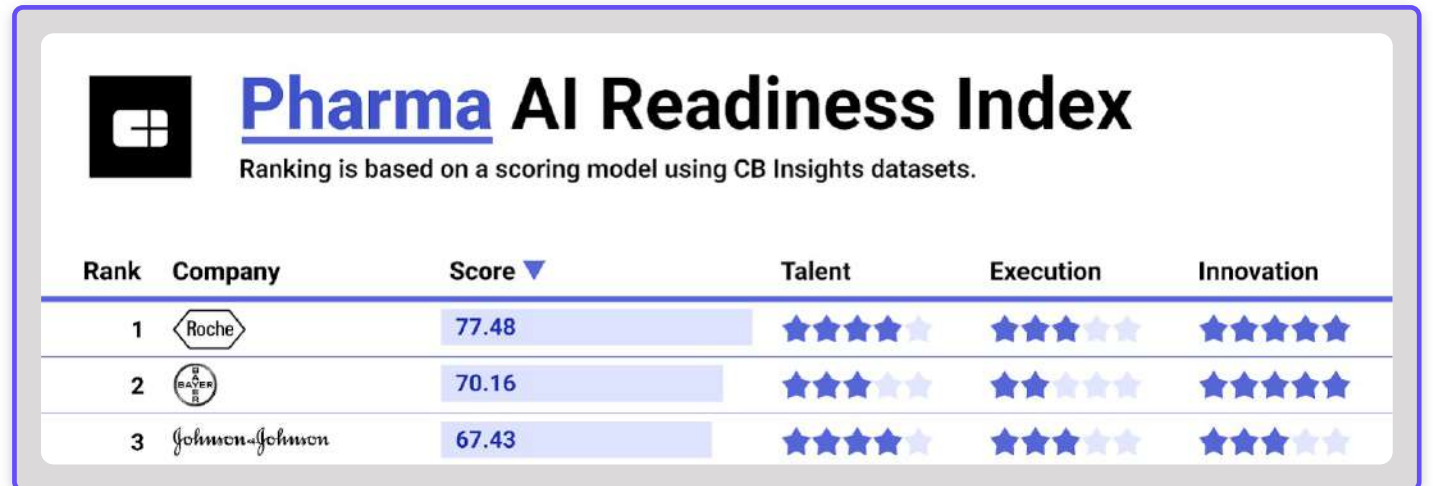
Partnered with AI precision medicine startup Exscientia to design pre-clinical drug candidates.



Led a Series D round for Recursion, which develops AI models for drug discovery. Recursion later went public and partnered with Bayer to develop new treatments for fibrotic diseases.



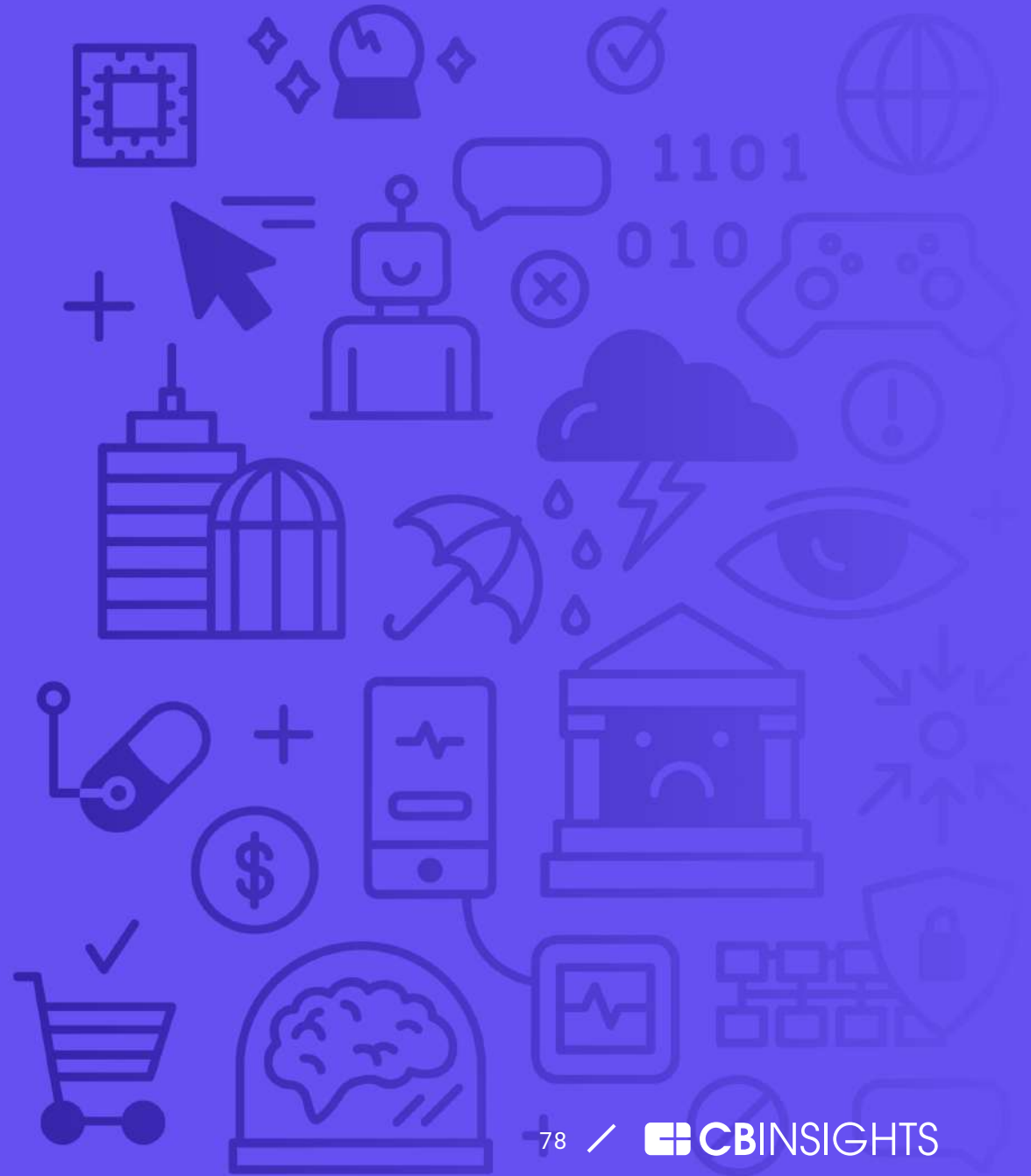
Entered into a multi-target discovery agreement with genAI-focused biotech Insilico Medicine.



Source: CB Insights business relationships data and research. The [Pharma AI Readiness Index](#) assesses how prepared top pharma companies are to adopt and respond to rapidly evolving AI technologies. Select AI partnerships shown for top 3 players. Partnerships and licensing agreements with AI companies factor into Execution scores.

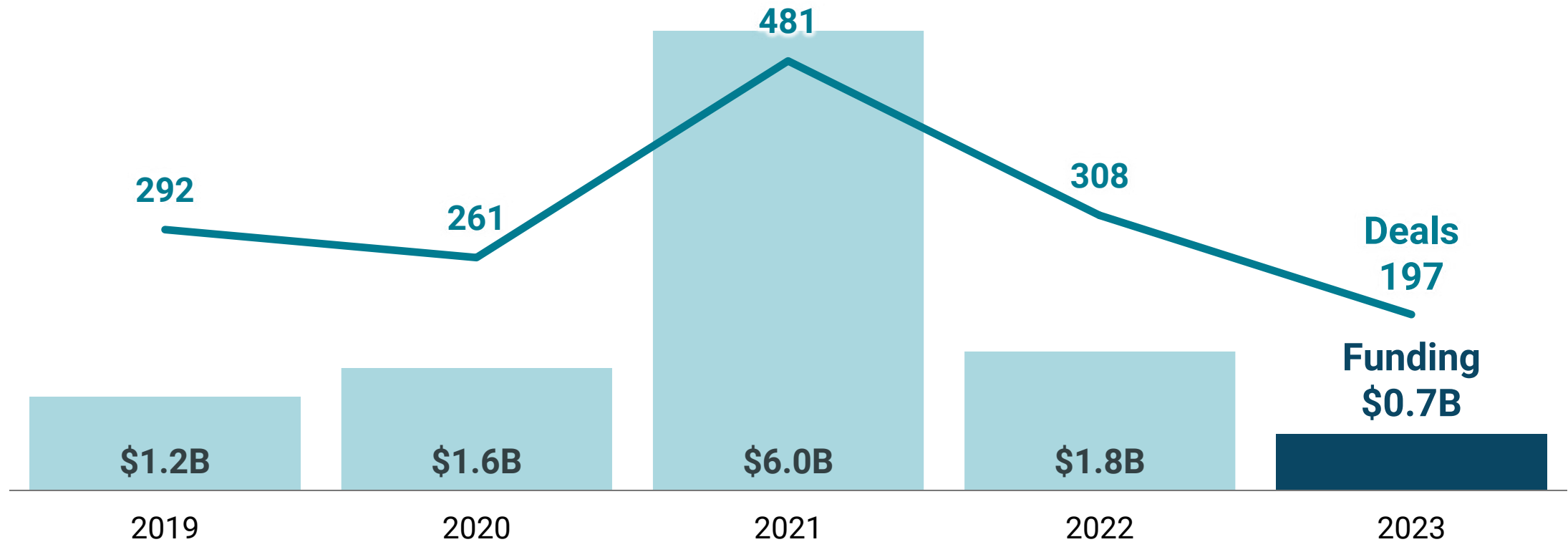
Healthcare & life sciences

Digital therapeutics (DTx) & wellness consolidates



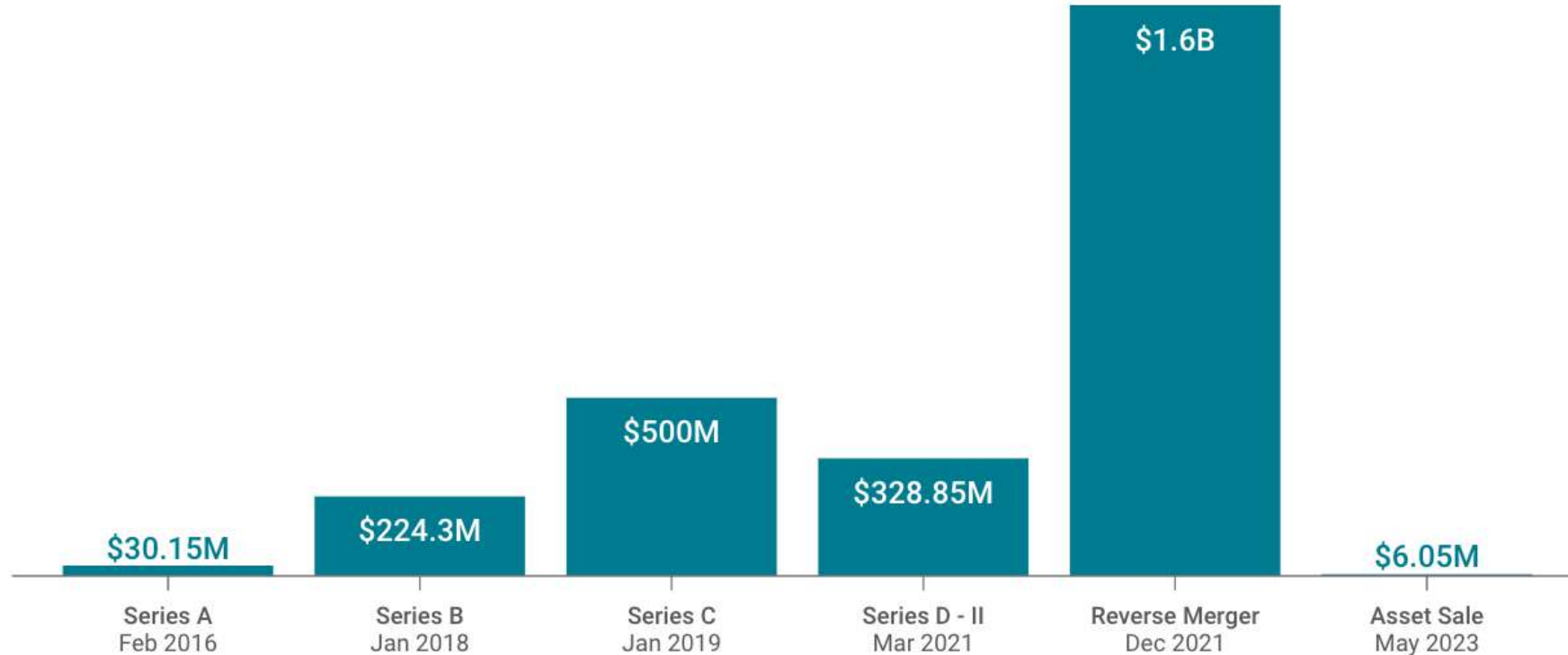
Investors turn away from DTx & wellness amid lack of payer support and reimbursement challenges

Disclosed equity funding to DTx & wellness companies



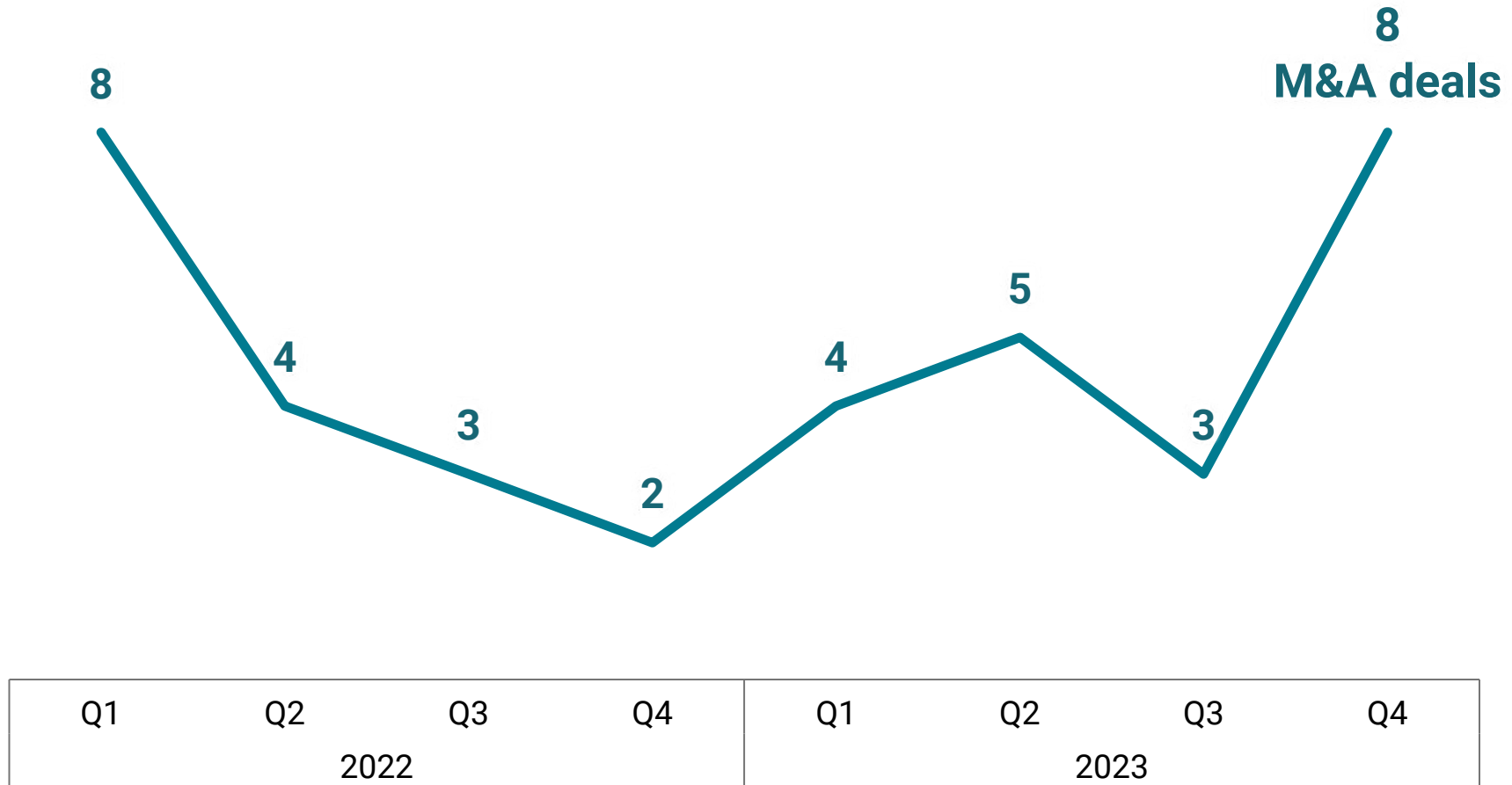
The industry was rocked by bankruptcy of DTx trailblazer Pear Therapeutics in 2023

Reimbursement challenges weighed heavily on Pear, which was sold for parts in May '23



Source: CB Insights valuation data – [Pear Therapeutics](#). Note: chart shows valuation by round.

Amid funding downturn, DTx & wellness M&A is gaining momentum



Well-funded DTx & wellness companies are being snapped up by peers amid consolidation

Select M&A deals in 2023



Total equity funding: \$284M

Assets sold to Click Therapeutics, Harvest Bio, Nox Health, and Welt



Total equity funding: \$55M

Acquired by Beacon Biosignals



Total equity funding: \$27M

Acquired by Big Health

Insurance coverage will remain a critical challenge for DTx & wellness in 2024

Looking ahead this year, therapeutics & wellness buyers identify coverage as key area for growth



“Luminopia may have room for growth by getting approval with insurance companies. However, the insurance companies are hesitant to cover the cost of dichoptic therapy, which is at least \$150 a month.

Luminopia may need to work with the insurance companies and find success that even doctors have failed to achieve...The price point of \$45 per patient with the Medicaid population may not be sustainable.”

Luminopia customer
President, Pediatric ophthalmology company (December 2023)



“Oshi Health has room for growth in expanding their coverage to all 50 states and increasing their reach into health plans. Currently, Oshi Health is

integrated with Marpai, Quantum Health, UHC, and Aetna and serves 75% to 80% of their clients' needs. As demand for their product offering increases, [my client] expects to see continued growth within the health plans and across the United States.”

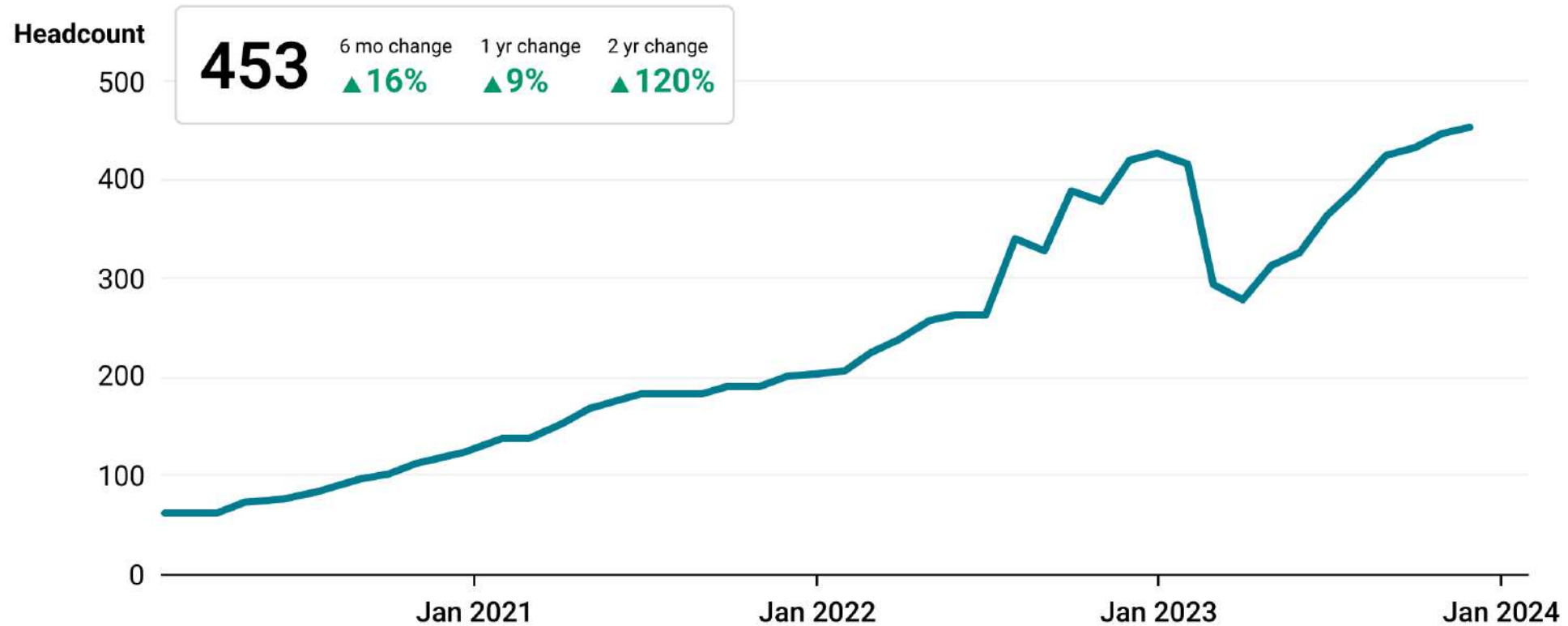
Oshi Health customer
Director, Publicly traded insurance company (December 2023)

Healthcare & life sciences





The brain becomes a fierce tech battleground



Elon Musk's Neuralink just announced its first human brain implant – and its workforce is rising quickly as it revs up

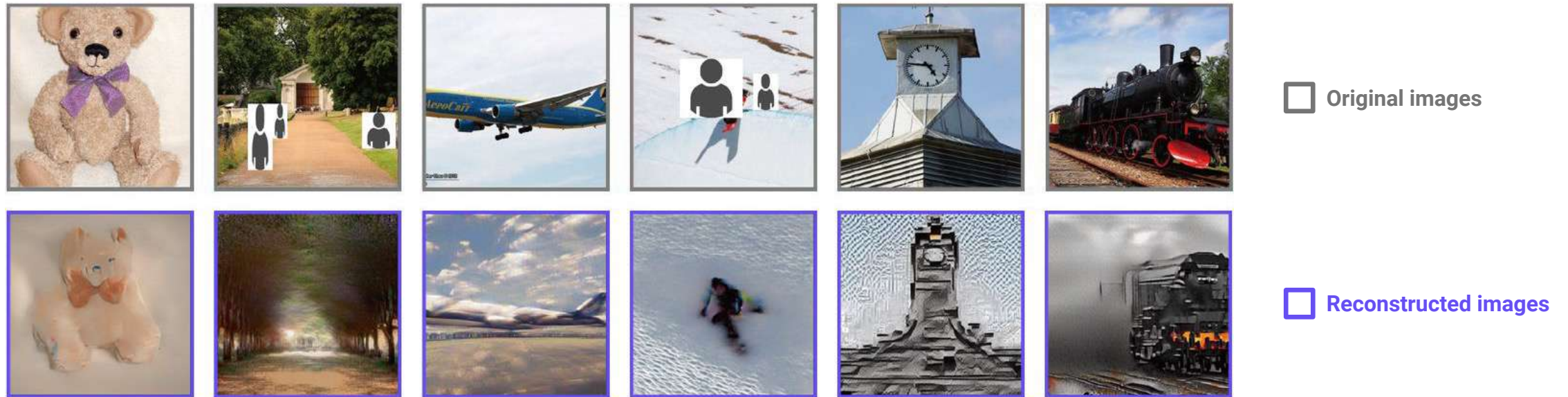


Investors are betting on brain-computer interfaces to initially help motor-impaired patients, and human trials are kicking off

Company	Headquarters	Total equity funding	Latest funding round	Recent milestone
 NEURALINK	US	\$680M	Series D (08/07/2023)	Human trial in progress
 synchron	US	\$125M	Series C (12/15/2022)	Human trial in progress
 Paradromics	US	\$96M	Series A (11/01/2023)	Received FDA Breakthrough Device designation
 Precision	US	\$53M	Series B (12/19/2022)	Received FDA Breakthrough Device designation

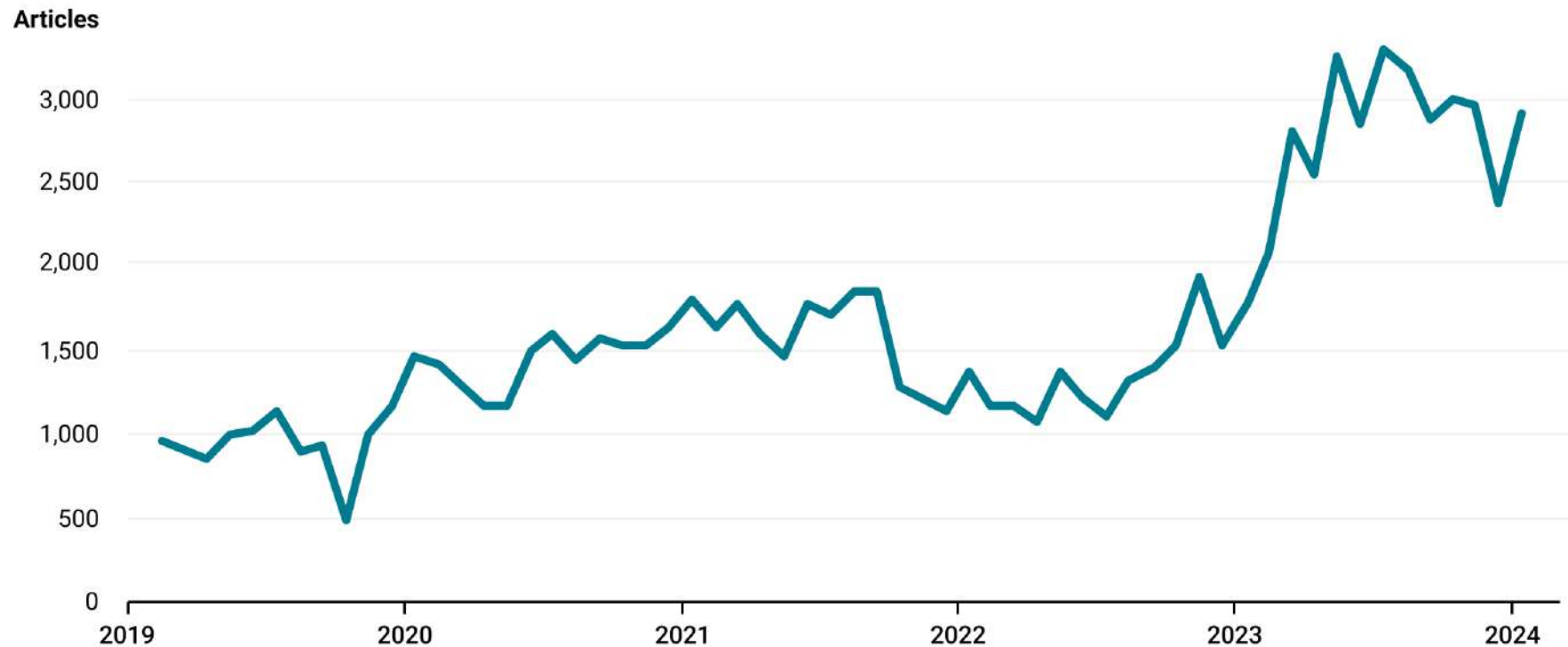
Meanwhile, brain activity data can now be coupled with AI to ‘read minds’ with eerie accuracy

Original images a participant was viewing compared to those reconstructed from their fMRI data and Stable Diffusion



As the brain-computer interface landscape matures, privacy debates will reach a new fever pitch

Data privacy media mentions were at an all-time high in 2023 – but tech that can capture even superficial information on inner thoughts will intensify scrutiny



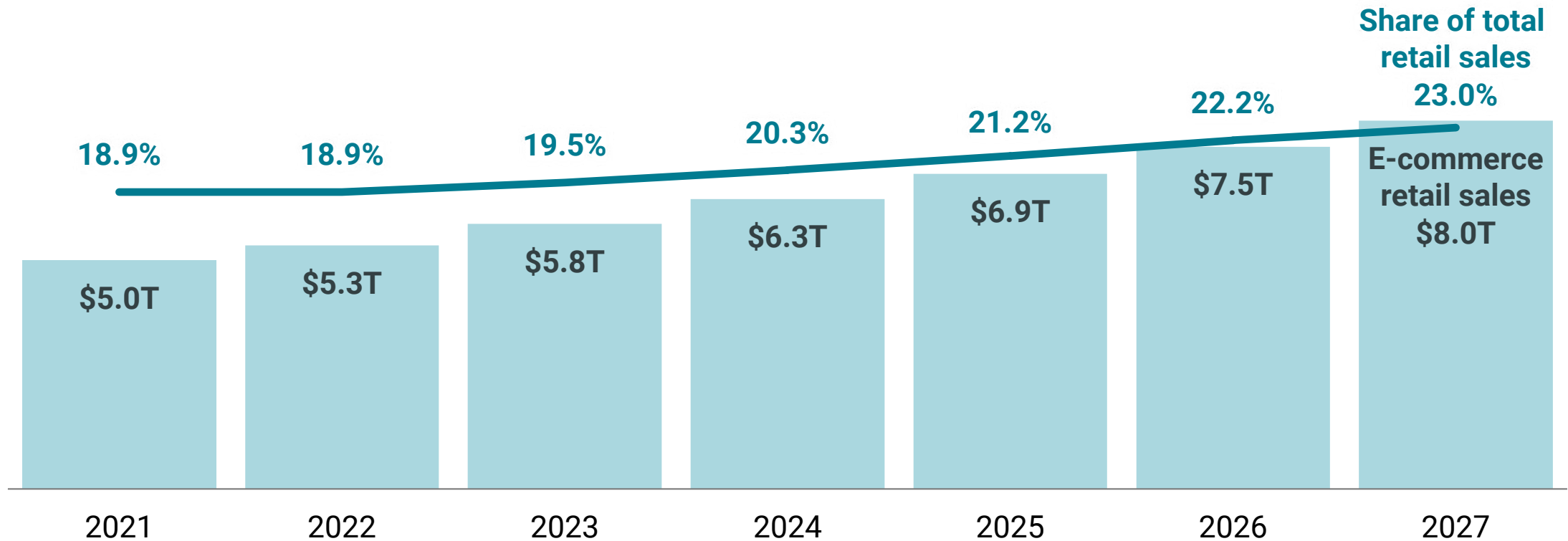
Retail & consumer

AI sales agents flood the e-commerce landscape



As e-commerce grows, retailers don't want to be caught on the back foot

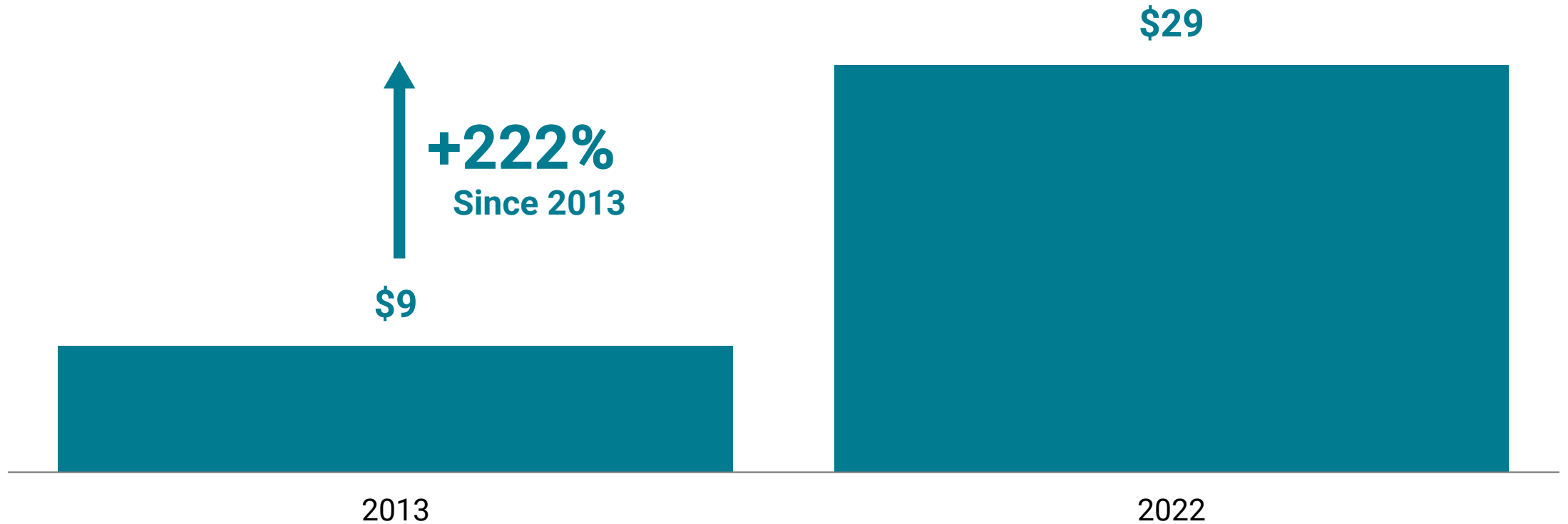
E-commerce sales are poised to increase, making up a greater share of total retail sales



Source: Insider Intelligence | eMarketer. Years 2023 to 2027 are projections.

But finding new customers is cutting deeper into profits over time

E-commerce brands & retailers lose \$29 for each new customer acquired – over 200% more than in 2013



Retailers turn to startups to find new ways to engage and convert online shoppers...







Digital shopper engagement

.arianee
charles DATAGRAIL EON FERMINT gorgias
Loyal Guru METAVRS Nibble novel Postscript
Session AI (formerly ZineOne) Wildfire Wizard zitcha zowie

...As advances in NLP allow for AI bots that can haggle and upsell

Early-stage companies in the space include Retail Tech 100 winners Nibble and Zowie



Company	Latest round	Select investors
 Nibble	\$3.3M seed (March 2022)	Venrex
 zowie	\$14M Series A (May 2022)	Tiger Global Management, Gradient Ventures, Jack Altman
 <u>BATNA</u>	\$0.04M accelerator (March 2023)	Fashion Technology Accelerator
 ergo	\$1.5M pre-seed (October 2023)	Anthemis, Wischoff Ventures

AI price negotiation boosts customer engagement



“India is a very price-sensitive market, and haggling is in our DNA. Customers are used to shopping and bargaining in an offline setting, so when it was presented to them in an online setting, **it was something very new, something worth trying, and a lot of them just did it for the fun of it.**”

Nibble Technology customer
Founder, Retail company

Expect to see more AI sales agents built into e-commerce & social channels

AI sales chatbot developers flock to platforms like Shopify, Instagram

Commerce platform

Select partners offering AI sales chatbot integrations



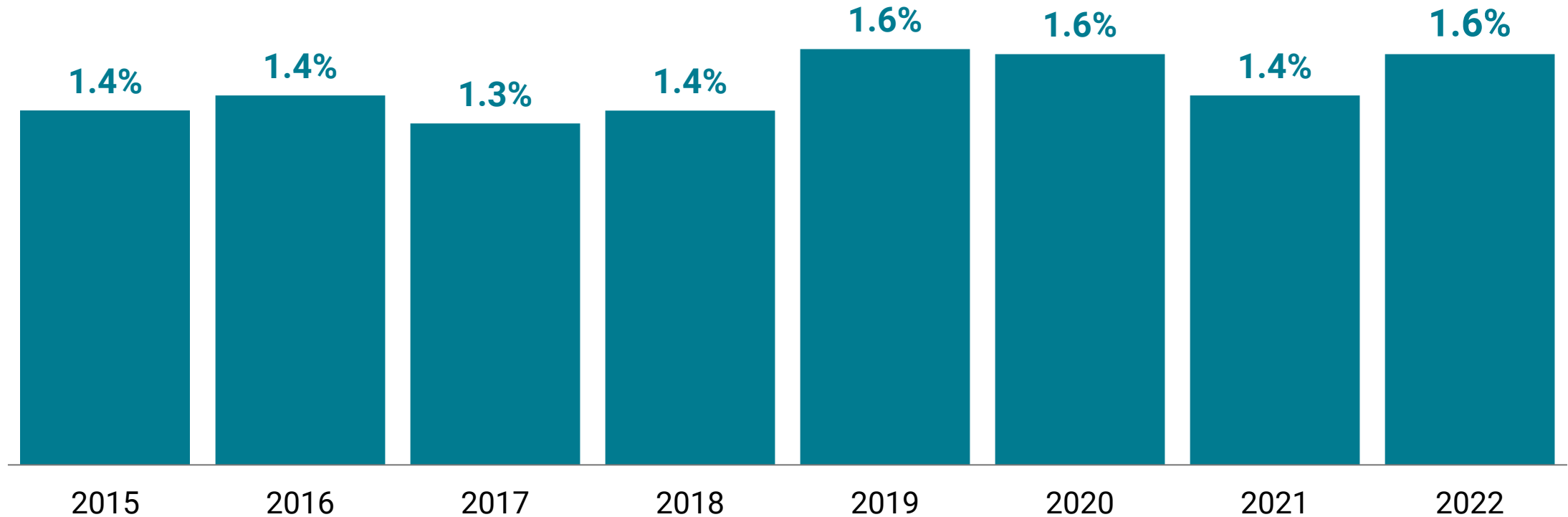
Retail & consumer

Retailers tackle shrink with AI loss prevention



Inventory loss costs retailers \$100B/year & it's not getting better

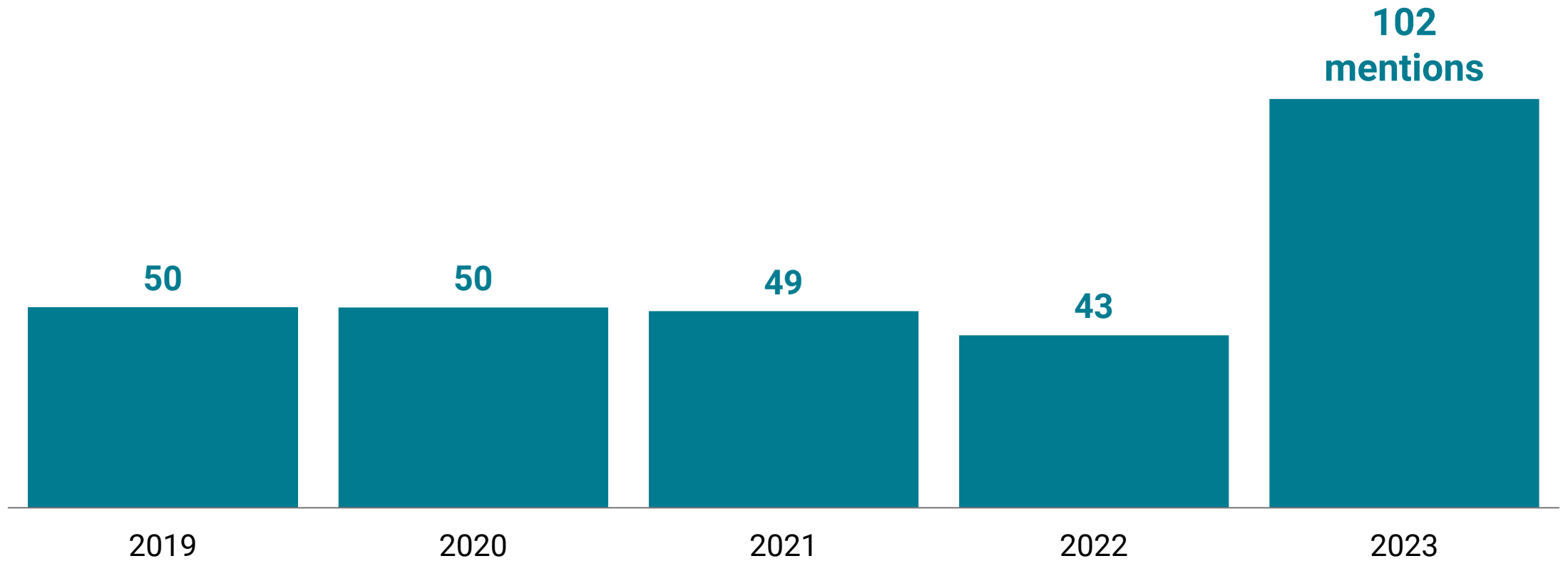
% of US retail sales lost to shrink has remained stubbornly high



Source: National Retail Federation. Note: Shrink refers to inventory loss due to theft or error.

Executives express growing concern around shrink

Mentions of retail shrink on earnings calls



Incumbents look to tech to prevent inventory loss



“...we are making **investments in technology** to improve store productivity, lower digital fulfillment costs, and reduce waste and shrink. These improvements will drive an **incremental \$1B of cost savings in 2023.**”

CFO Gary Millerchip, Q1'23 earnings call











“...shrink was in line with last year's results, **despite industry-wide challenges**, driven by our proactive customer service, **tech-driven solutions**, industry-leading asset protection program, and our penetration of rural stores. We're developing...**RFID technology** embedded in power tools **to prevent theft.**”

EVP of Stores Joe McFarland, Q3'23 earnings call

Investors funnel money toward AI-powered loss prevention

Loss prevention tech companies raise massive funding rounds in 2023

Company	HQ	Latest funding round	Select customers	Round investors
	US	\$100M Series D (October 2023)	 	Alkeon Capital Management (Lead), First Round Capital, Lightspeed Venture Partners, next47
	Ireland	\$71M Series A (May 2023)		Crosspoint Capital Partners (Lead)
	Canada	\$60M Series C (July 2023)	 	Goldman Sachs Asset Management (Lead), BDC Venture Capital, OMERS Ventures

Source: CB Insights company profiles – [Verkada](#), [Everseen](#), [Solink](#). Note: Examples of AI applications for in-store loss prevention include real-time camera feed analysis and self-checkout behavior scanning.

AI loss prevention can also enable other in-store tech, like self-checkout, to drive efficiency

everseen

“The Everseen product **identifies and pauses transactions when merchandise is present at the self-checkout but not scanned...to prevent loss**. Additionally, it uses AI to identify merchandise and ensure that customers are scanning the correct item. ... Throughout our organization, from store level to senior management, there is a lot of support for Everseen and the value that it adds. **It has become a necessary part of our business and the protection of our assets.**”

Everseen customer
Director, Fortune 500 company

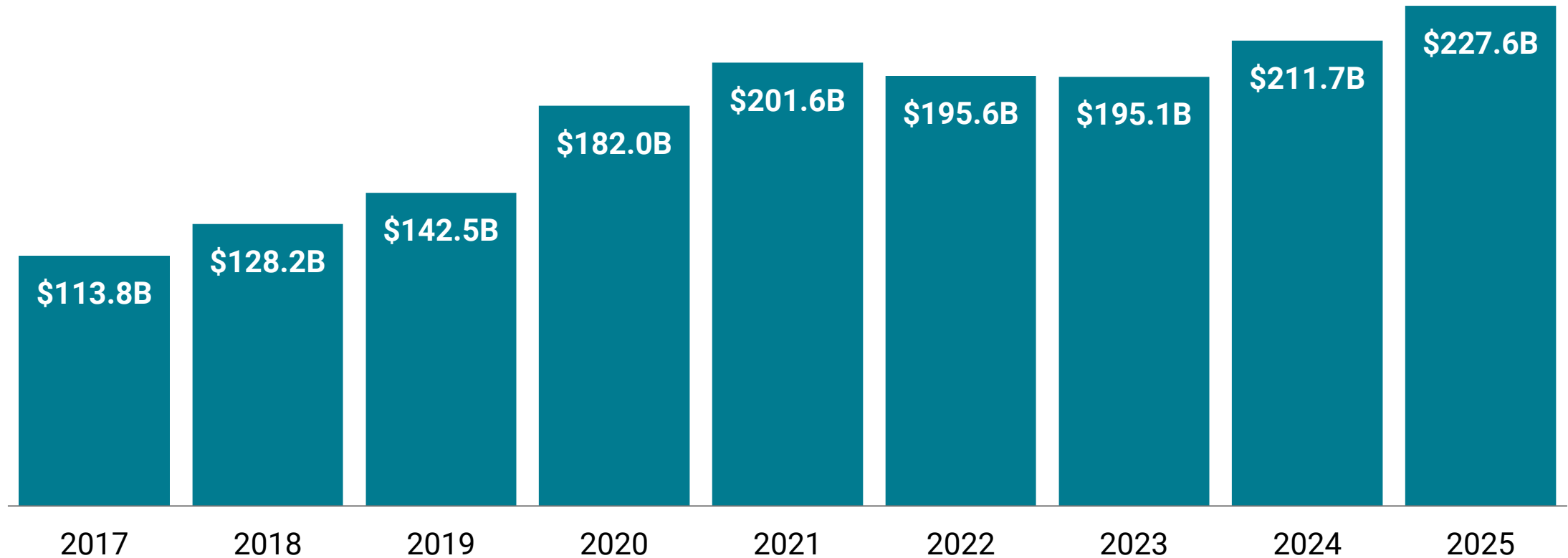
Retail & consumer

AI sends a shockwave through gaming



Video games represent a massive – and growing – opportunity

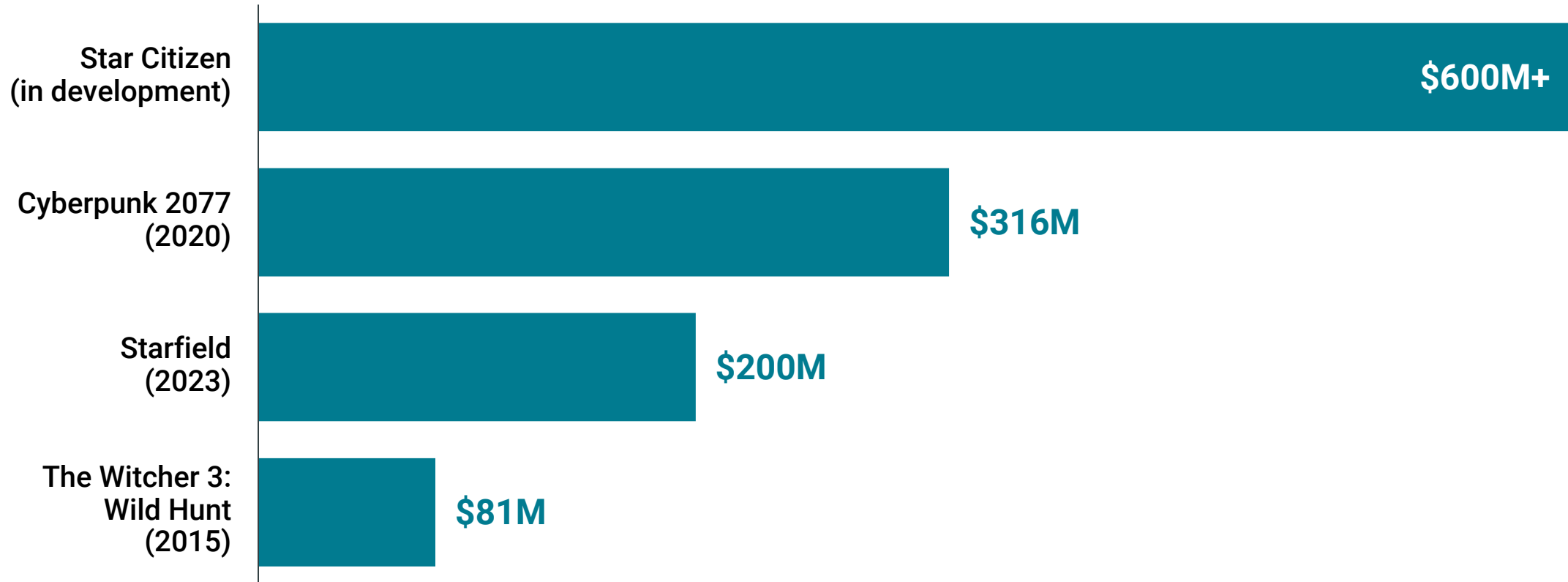
With \$190B+ in annual revenues, gaming is 5x bigger than the movie industry



Source: IDC. Years 2023 – 2025 are projections.

But making games isn't cheap

AAA games can require hundreds of developers and 9-figure budgets

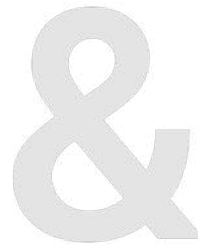


Developers rush to adopt genAI even as they worry about its misuse



64%

of developers use
(or want to use) genAI
or have colleagues
who use it

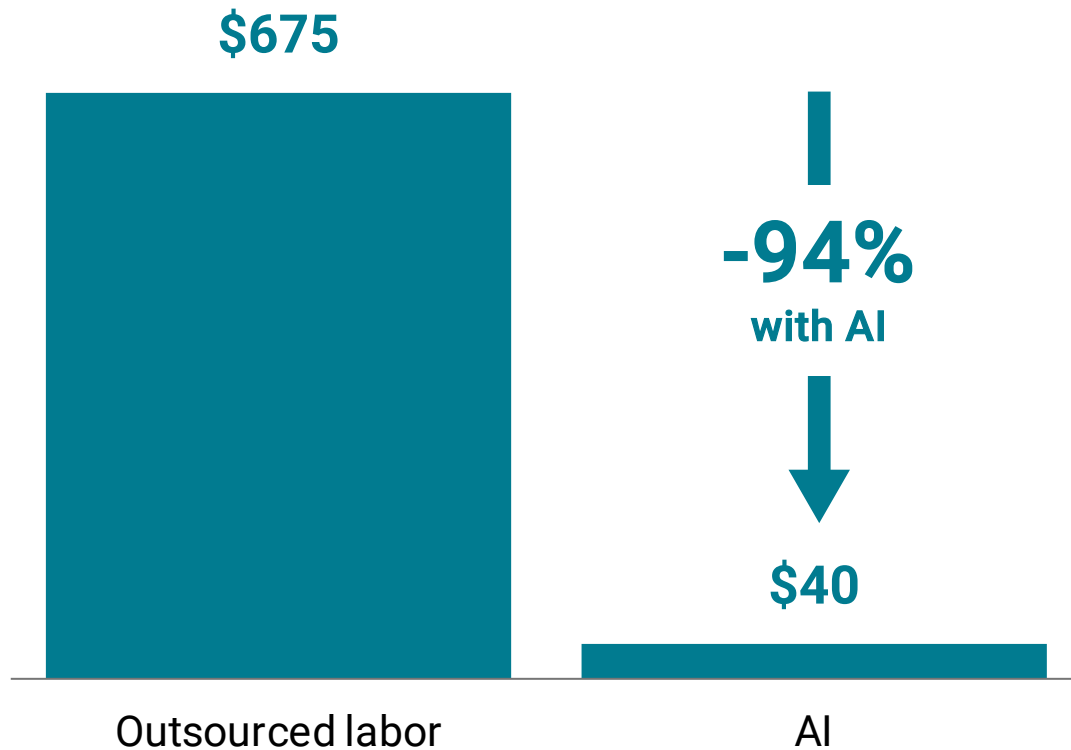


84%

of developers are
concerned about the
ethics* of using genAI
for development

AI could cut dev costs while making gameplay more immersive

The cost of outsourcing development for a single in-game character vs. using AI to do it

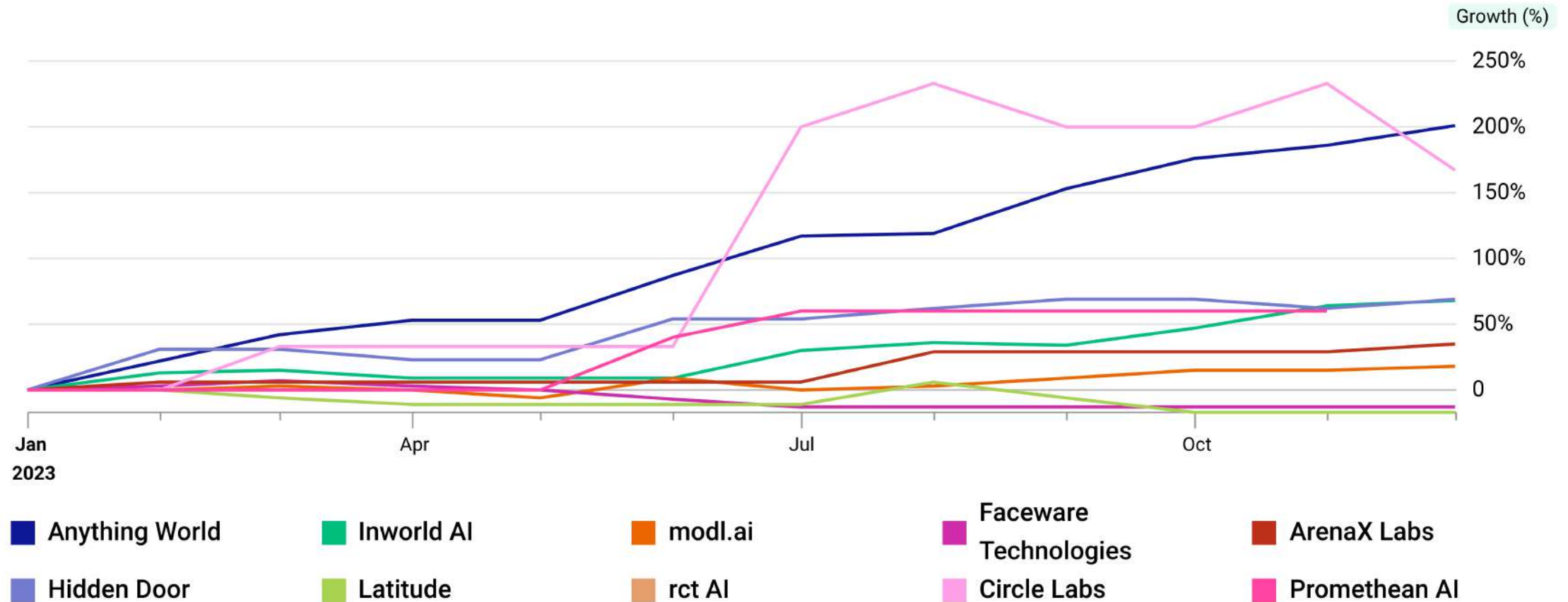


“The average game time **increased by 5%** due to the interaction with AI [non-player characters].”

Ryan Yang, founder & CEO of MageCosmos, in a case study on Inworld’s AI NPCs









And the market for AI-generated content is heating up

Most synthetic gaming companies – which use AI for lifelike non-player characters, object animations, & more – ended 2023 with strong YoY headcount growth



Incumbents will lead the shift with developer- and creator-focused tools

Recent genAI releases from major gaming companies and their partners

Gaming incumbent	Partners (if applicable)	Release description
	 	Unity releases two creator-focused AI engine platforms – Sentis and Muse – and launches a marketplace for 3rd-party AI tools with integrations to Inworld, modl.ai, and others (June 2023)
	N/A	Roblox launches Assistant, an AI copilot that helps creators to code, build worlds using natural language commands, and more (September 2023)
		Microsoft's Xbox announces multi-year partnership with Inworld to build AI-powered game design and narrative tools (November 2023)
		Epic's Unreal Engine links up with 3D model creator Cybever to give developers access to Cybever's 3D assets (January 2024)

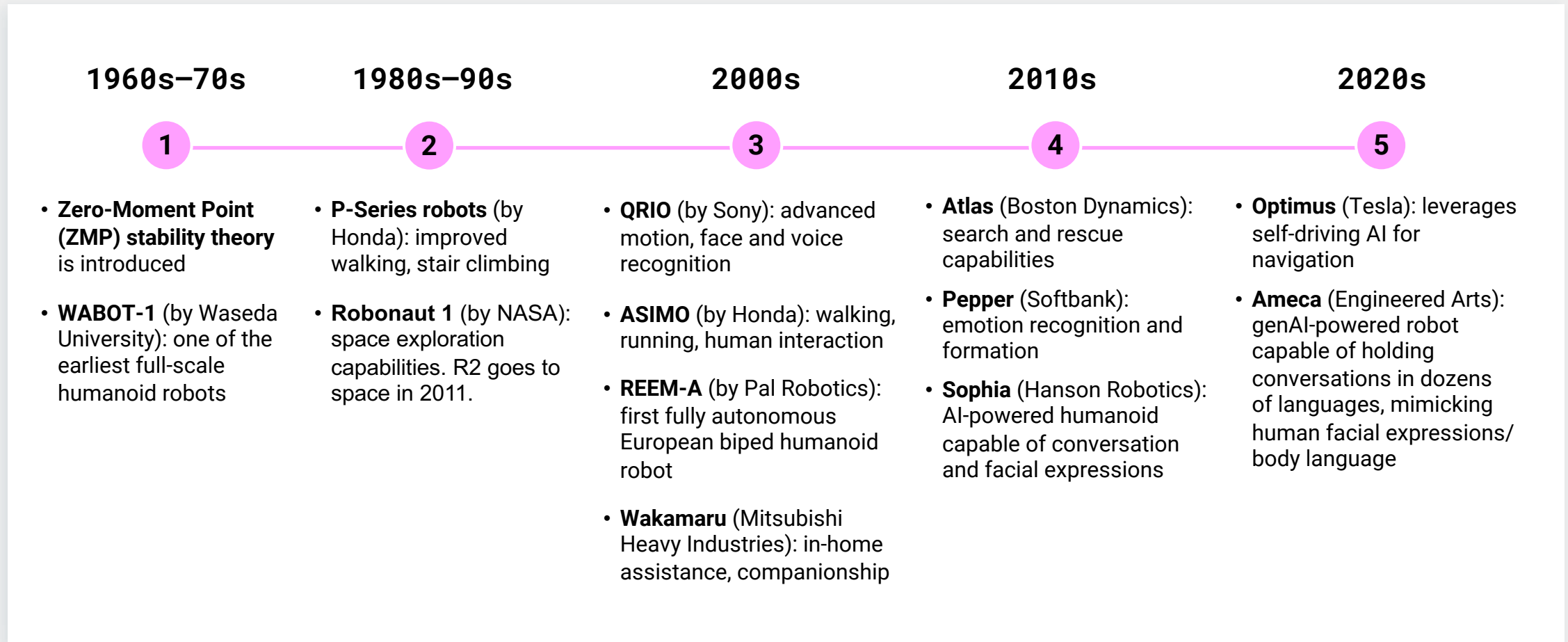
Industrials

Humanoid robots come for manufacturing



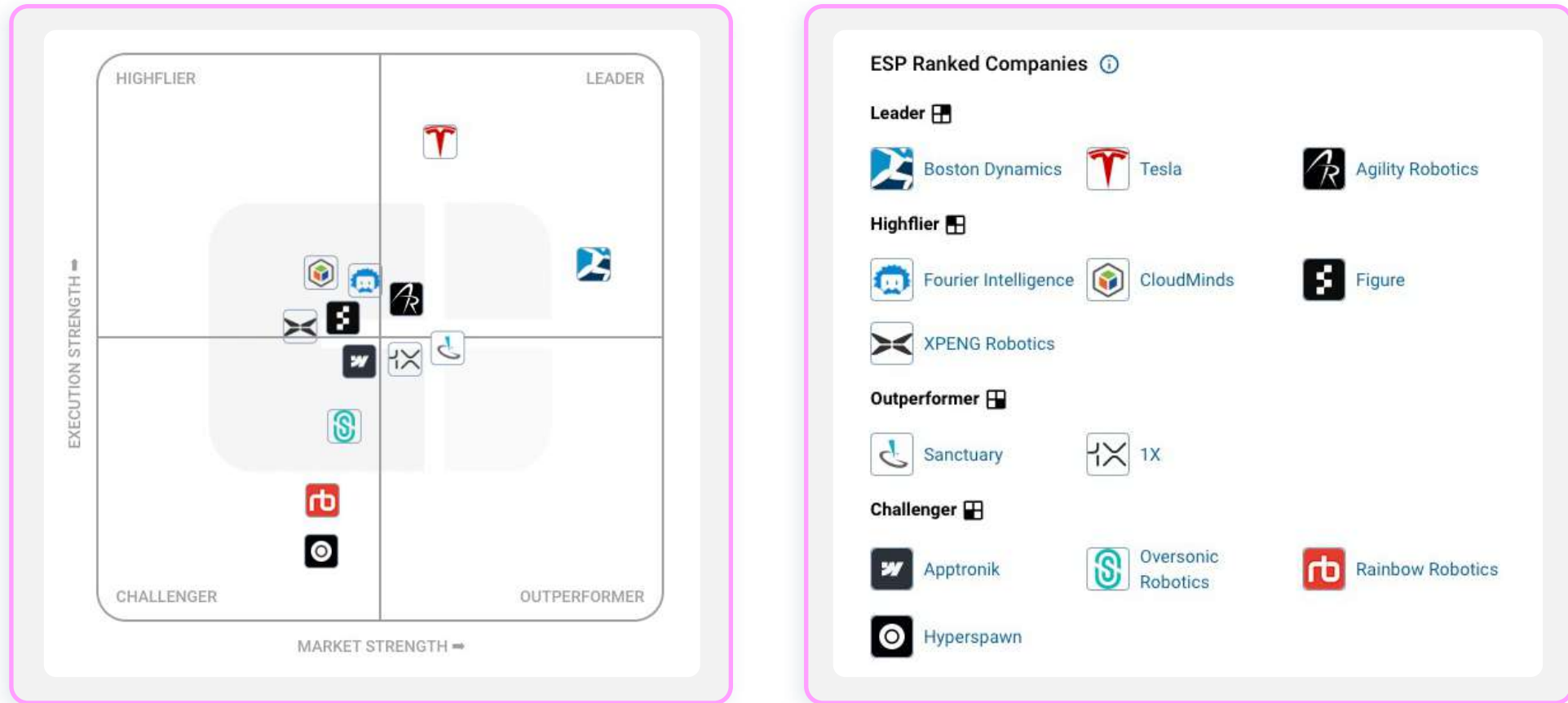
Humanoid robots have been in development for decades

Select advances since 1960 showcase progression of humanoid capabilities



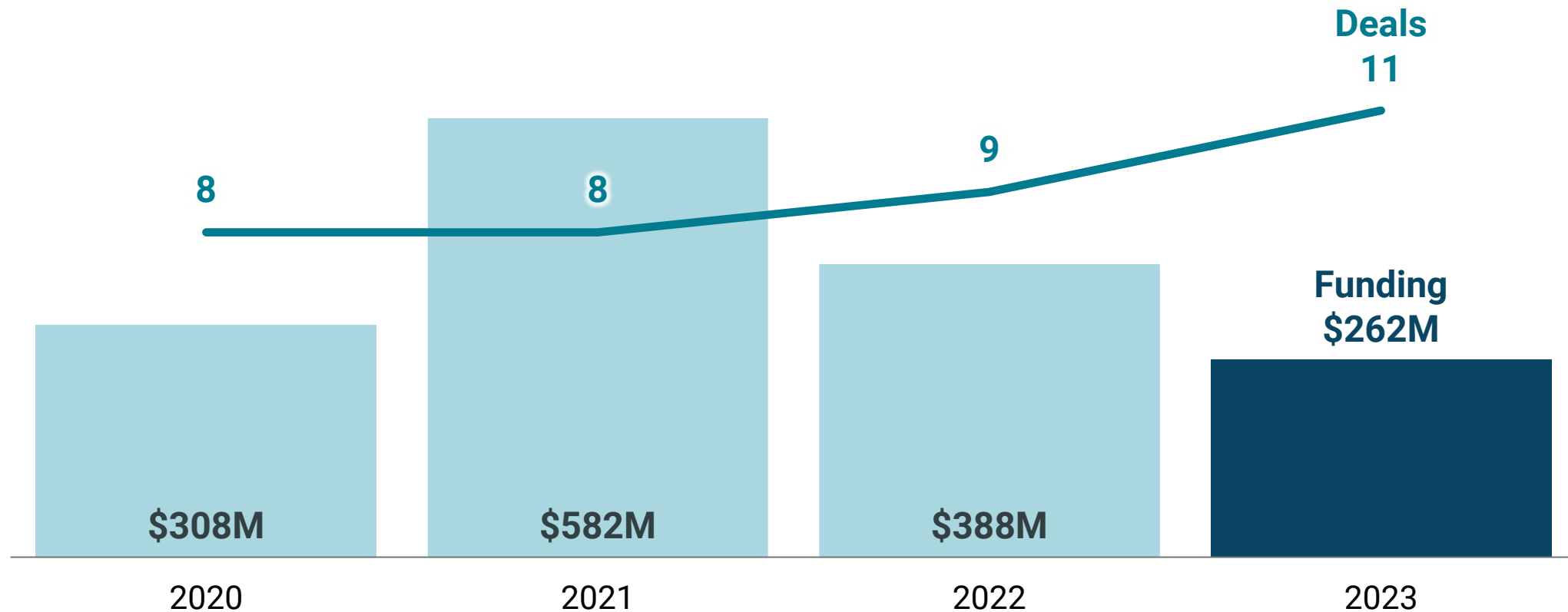
Leading public players in humanoid robotics face a growing network of innovative startups

Boston Dynamics and Tesla currently lead in market and execution strength



Humanoid robotics startups gain momentum despite broader venture slowdown

Dealmaking in the space ramped up in 2023



As the market develops, competition for market share gets heated

Tesla CEO Elon Musk discusses competitor Boston Dynamics on Q3'23 earnings call

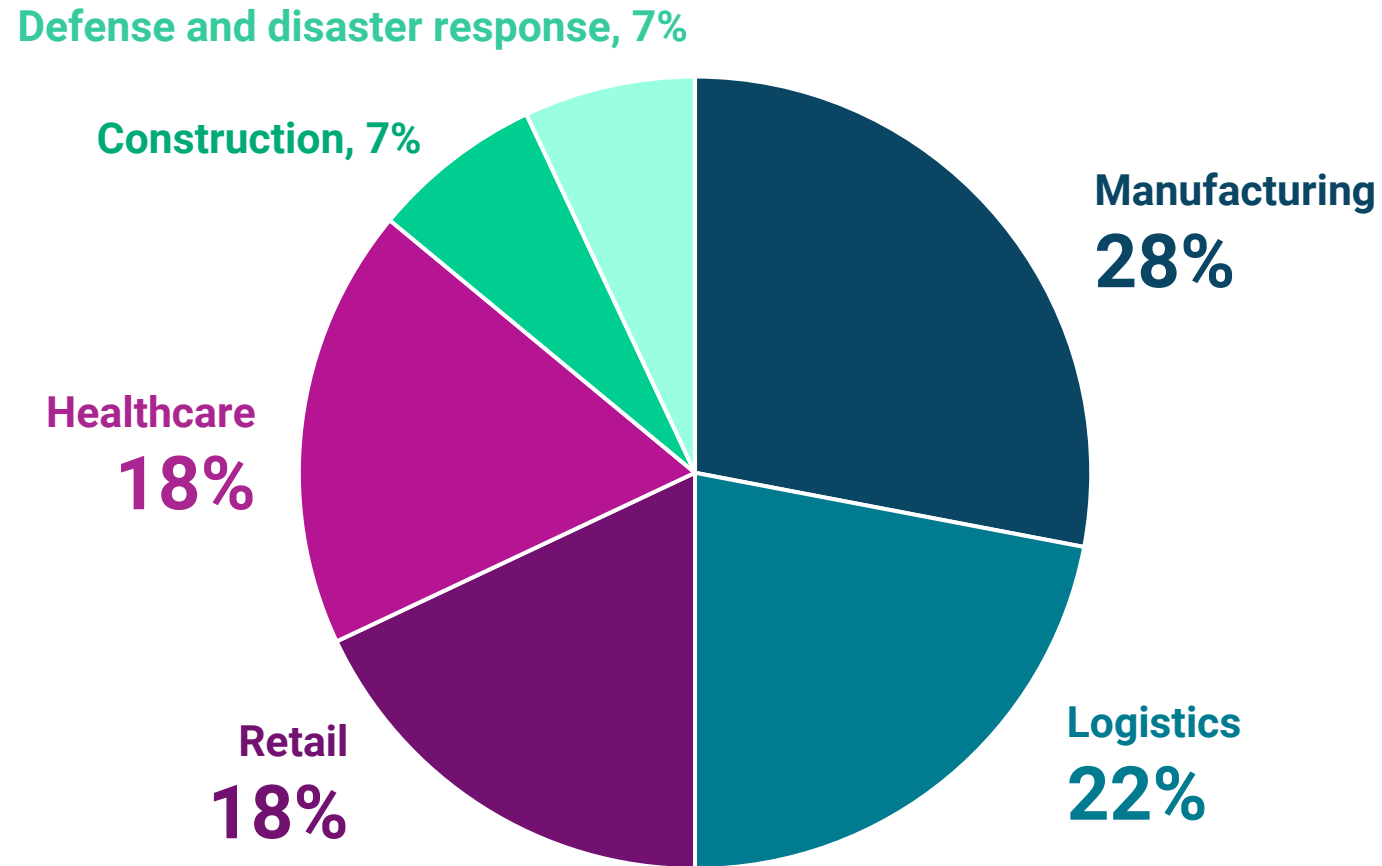


“...If you no longer have a constraint on people, effectively, you’ve got a humanoid robot that can do as much as you’d like, your economy is wisely infinite or infinite for all intents and purposes. **So, I don’t think anyone is going to do it better than Tesla, not by a long shot. Boston Dynamics is impressive, but their robot lacks a brain or like the Wizard of Oz, whatever. Yes, lacks a brain.**”

Elon Musk, Tesla Co-founder and CEO

Humanoid robotics companies want to disrupt manufacturing

Manufacturing mentioned as a focus area 4x as much as construction



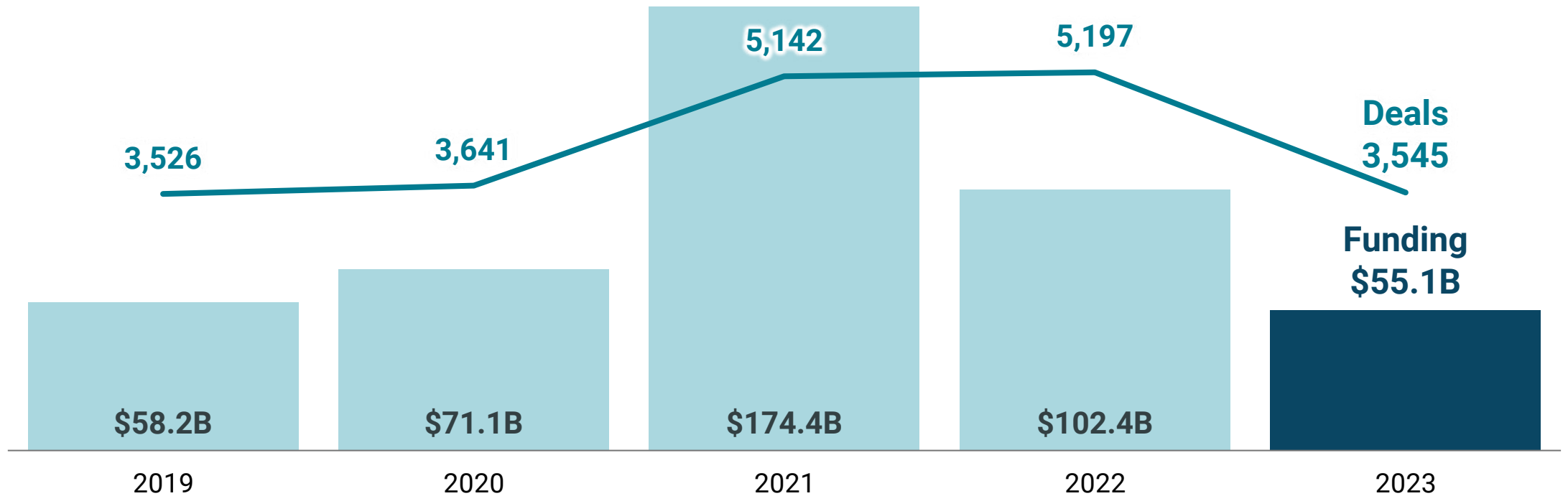
Venture

Corporate venture refocuses on strategic fit



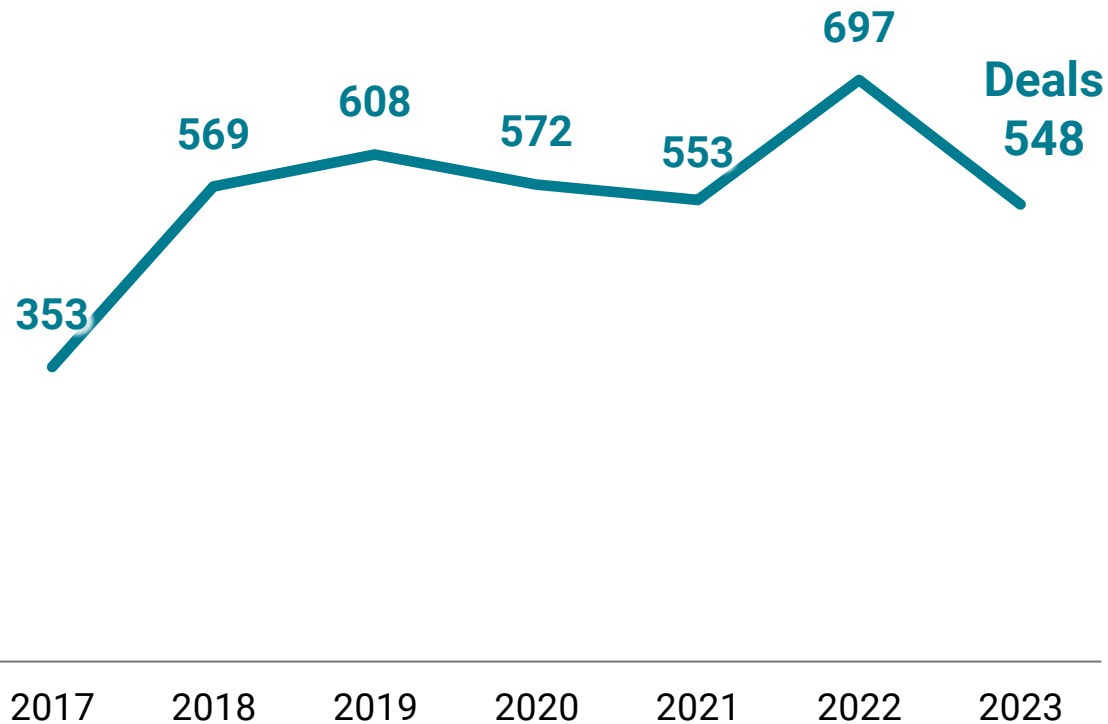
Corporate VC dealmaking is in retreat in the face of macroeconomic challenges

CVC-backed equity deals hit a 4-year low in 2023 amid corporate belt-tightening and subdued returns from startup exits



One exception: The most active CVCs are now based in Japan

Japanese CVC activity has held steady with strong government backing and cash stockpiles



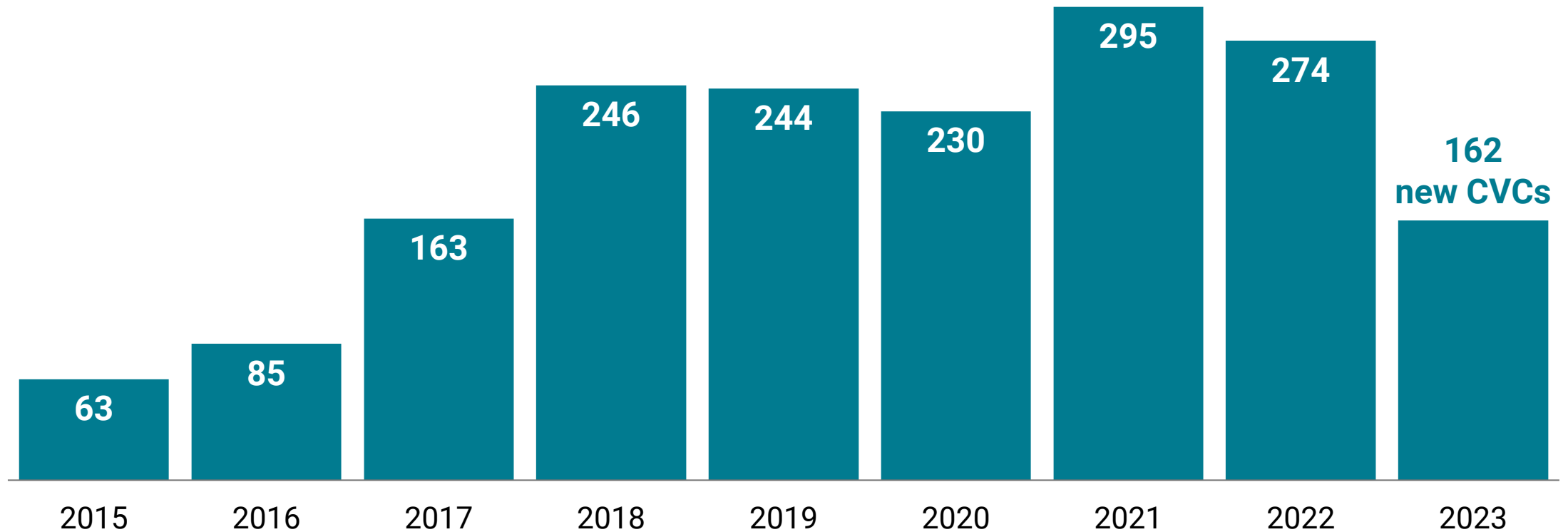
Top CVCs by company count in Q4'23

Investor	Company count	Country
1 Mitsubishi UFJ Capital	22	
2 SMBC Venture Capital	18	
3 Mizuho Capital	15	
4 Google Ventures	14	
5 KB Investment	11	
5 Samsung NEXT	11	
7 SBI Investment	10	
8 Mitsui Sumitomo Insurance Venture Capital	8	
8 SDIC Venture Capital	8	

Source: CB Insights financing data. Chart shows equity deals backed by [Japan-based corporate VCs](#).

Amid the subdued venture investing environment, we expect CVC formation broadly will continue to slow

Number of new corporate venture arms by year



Existing CVCs are refocusing on strategic fit in sectors they know well

CVC	Parent	Development
	Microsoft	M12 refocuses investment strategy to align with Microsoft's priorities (January 2023)
	Verizon	Verizon brings venture arm under its corporate strategy group (January 2023)
	TotalEnergies	Total Energies winds down its climate-focused venture arm , pivots to TotalEnergies On accelerator focused on early-stage energy companies (May 2022)
	Salesforce	Salesforce Ventures' portfolio is a key part of Salesforce's M&A pipeline , with two recent acquisitions (Airkit, September 2023; Spiff, December 2023) preceded by investment

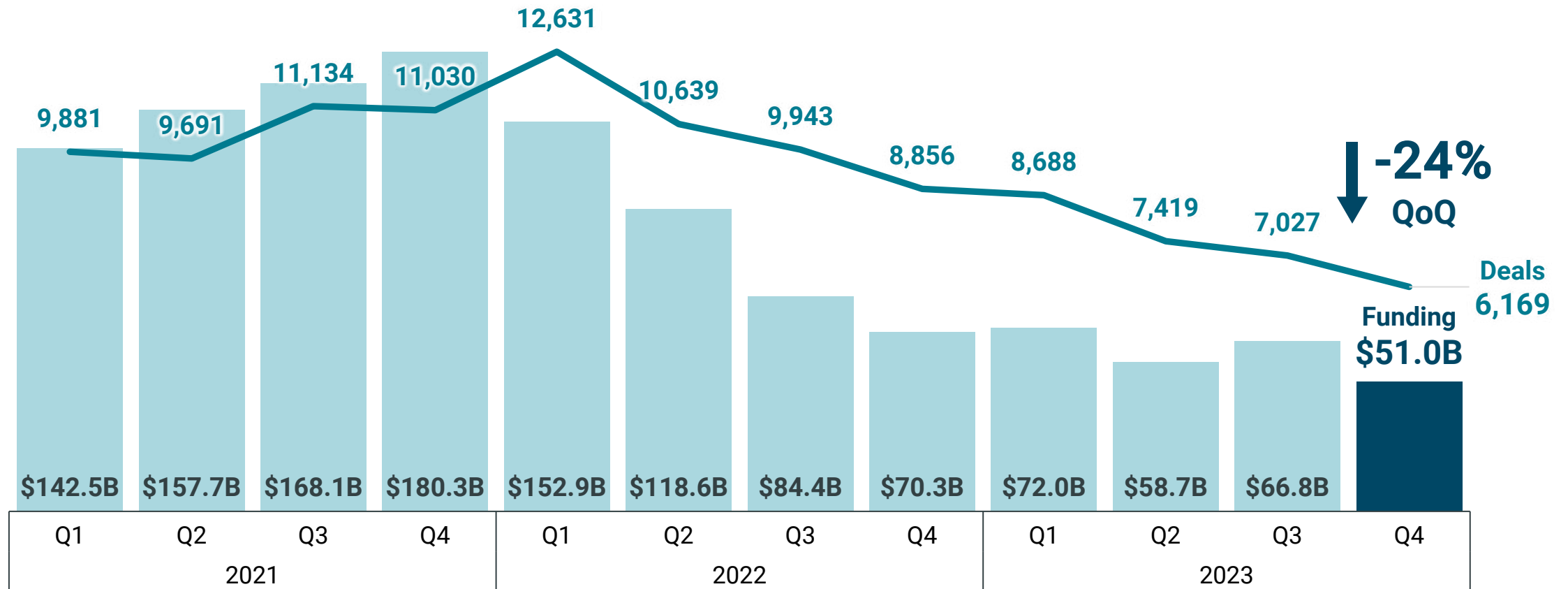
Venture

Unicorns need a new playbook to survive



Startups compete for shrinking funding pool

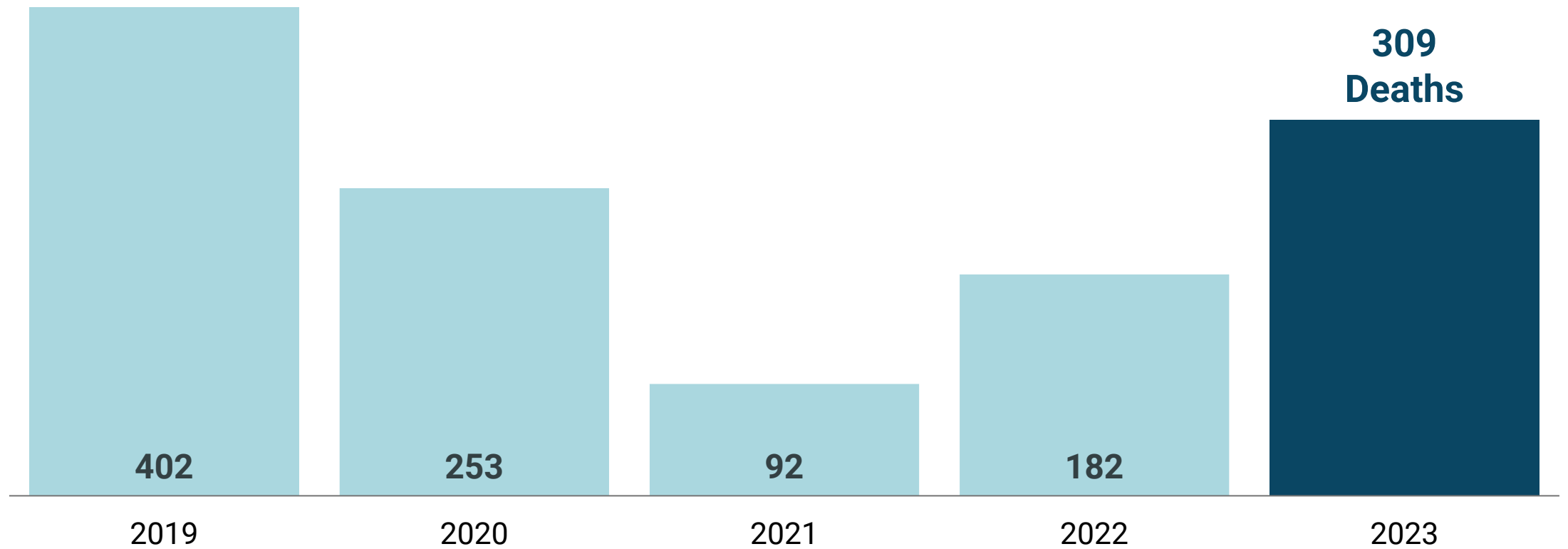
Global equity dollars and deals hit lowest levels in 6+ years in Q4'23



Source: CB Insights research — [State of Venture 2023 Report](#).

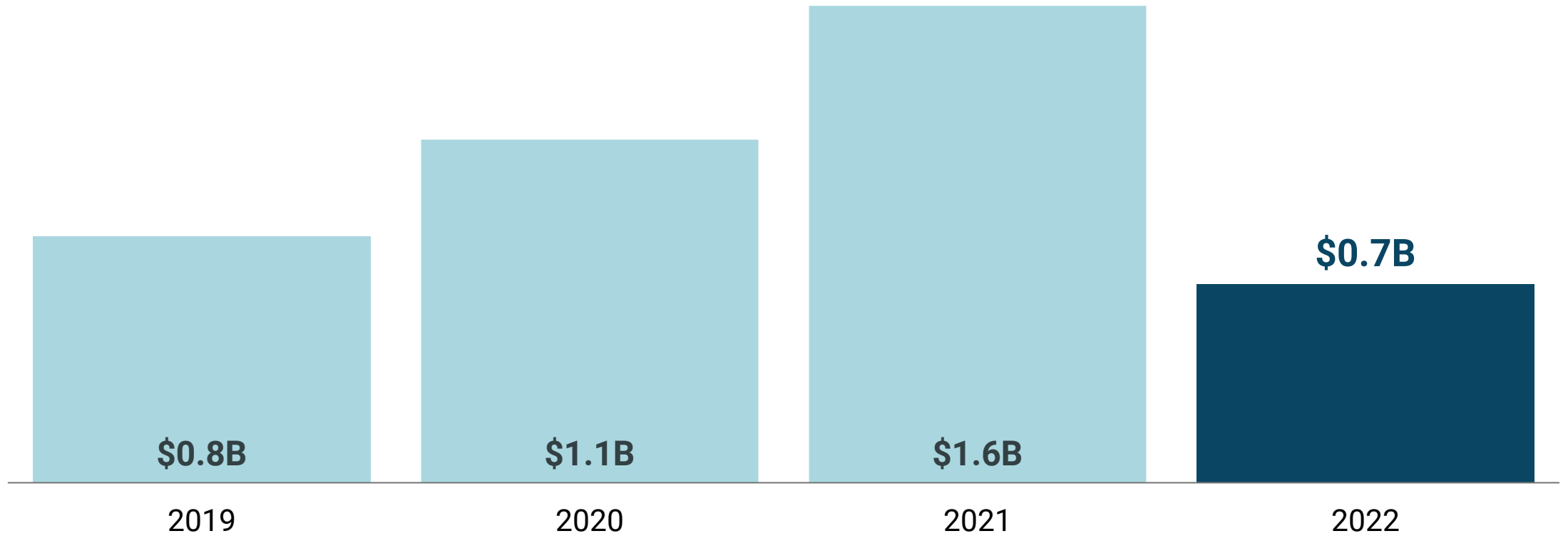
Startup mortality on the rise as macroeconomic headwinds persist

Number of publicly disclosed startup deaths



Failed startups flush billions of dollars down the toilet

Startups that shut down in 2023 raised \$4.1B in equity from 2019 to 2022



With tech boom in the rearview mirror, some unicorns can't sustain valuations and are forced to close shop

Top unicorn deaths in 2023 by latest disclosed valuation prior to shut-down



Olive

Valuation: \$4B
Total equity funding:
\$850M



CONVOY

Valuation: \$3.8B
Total equity funding:
\$836M



zume

Valuation: \$2.3B
Total equity funding:
\$446M

Remaining unicorns could be short on cash and face valuation loss, M&A, or closure in 2024

Top-valued unicorns that haven't raised in 2+ years



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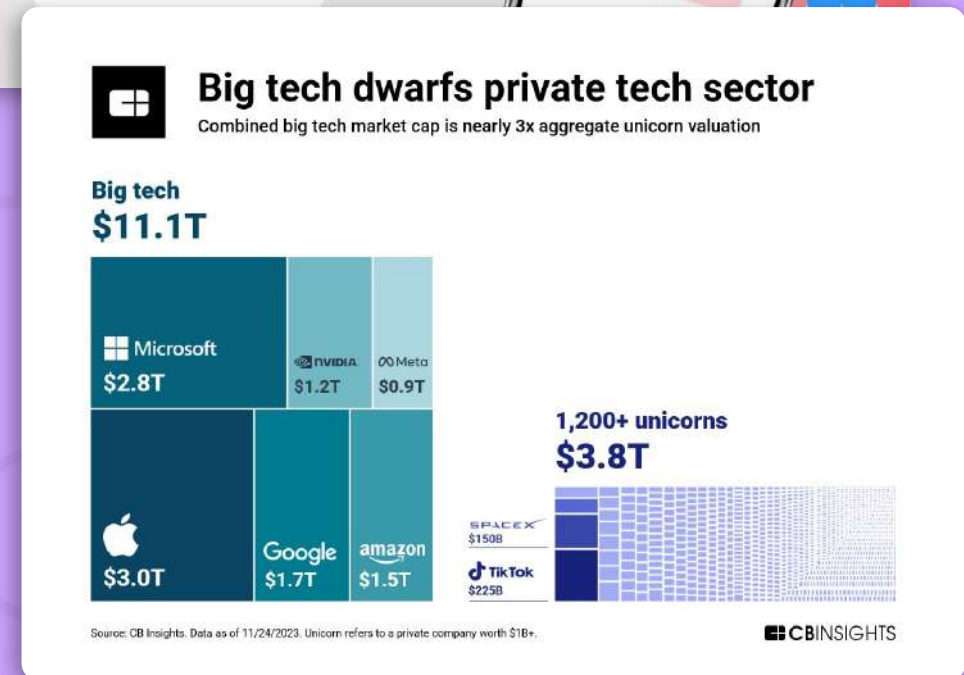
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<input type="checkbox"/> Insilico Medicine	insilico.com	Insilico Medicine operates as a clinical-stage biotechnology	Healthcare & life sciences	Protein & drug design	x	
<input type="checkbox"/> Grammarly	grammarly.com	Grammarly operates as an artificial intelligence (AI) power...	Consumer social apps & tools	Writing & storytelling, Sales & customer support	x	
<input type="checkbox"/> Hugging Face	huggingface.co	Hugging Face focuses on advancing and democratizing	Generative AI infrastructure	Model developer	x	x
<input type="checkbox"/> Baichuan AI	baichuan-ai.com	Baichuan AI focuses on artificial intelligence specifically in the	Enterprise tech			
<input type="checkbox"/> Lightricks	lightricks.com	Lightricks operates in content creation. It offers photo and vic...	Consumer social apps & tools	Consumer social apps & tools		
<input type="checkbox"/> AI21 Labs	ai21.com	AI21 Labs operates as an artificial intelligence (AI) lab an...	Generative AI infrastructure	Model developer, API access	x	
<input type="checkbox"/> Globally	globally.com	Globally is a company that focuses on autonomous	Industrials	Procurement	x	
<input type="checkbox"/> Productboard	productboard.com	Productboard provides a customer-centric product	Enterprise tech	Product management	x	
<input type="checkbox"/> H2O.ai	h2o.ai	H2O.ai delivers an advanced artificial intelligence (AI) cloud	Generative AI infrastructure	LLMOps		

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The screenshot displays a customer profile for OpenAI. At the top, it shows the company name 'OpenAI' with its location 'San Francisco, California, United States' and industry 'Internet / Internet Software & Services / Application & Data Integration'. Below this is a navigation bar with tabs for Overview, Research, Transactions, Press, IP, Network, and Transcripts. The main content area features a breadcrumb trail: Business Intelligence, Analytics & Performance Mgmt > Internet Software & Services > May 2023 > 17 min read. The title of the transcript is 'OpenAI customer – VP, Machine Learning at Fortune 500 company'. The 'Customer' section lists: Title (VP, Machine Learning), Company (Fortune 500 company), Role (Key decision maker), and Experience. The 'Purchase details' section lists: Purchase date (2022), Purchase amount (\$5M/year), Implementation time (2 months), CSAT score (8), and Intent to renew (90%). The 'Summary' section contains a bulleted list of key findings: 'Customer purchased OpenAI subscription on Azure', 'Subscription cost determined by tokens used', 'Tokens equivalent to 4 characters or 75% of a word', 'Evaluated OpenAI features, usability, customer service, cost-effectiveness, security, scalability, reliability, and potential for growth', and 'Found OpenAI to be a cost-effective solution with good features and customer service.' A quote from the customer states: 'They did a really great job in terms of the user experience...At the technology level, obviously pretty much state of the art.' attributed to 'VP, Machine Learning'. The 'Transcript' section is partially visible, showing 'Introductions' and 'Evaluation Structure' tabs, and a message from the analyst: 'Thank you for taking the time to speak with me today about OpenAI. This interview is expected to last around 25 minutes. Just a quick note before we start. As you answer these questions, please refrain from mentioning any personal identifiable information. If you don't have any questions for me, we can dive in.'



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