

Generative AI in Healthcare

Market Overview, Promising
Applications, Significant Generative AI
Partnerships and Healthcare AI
Investments



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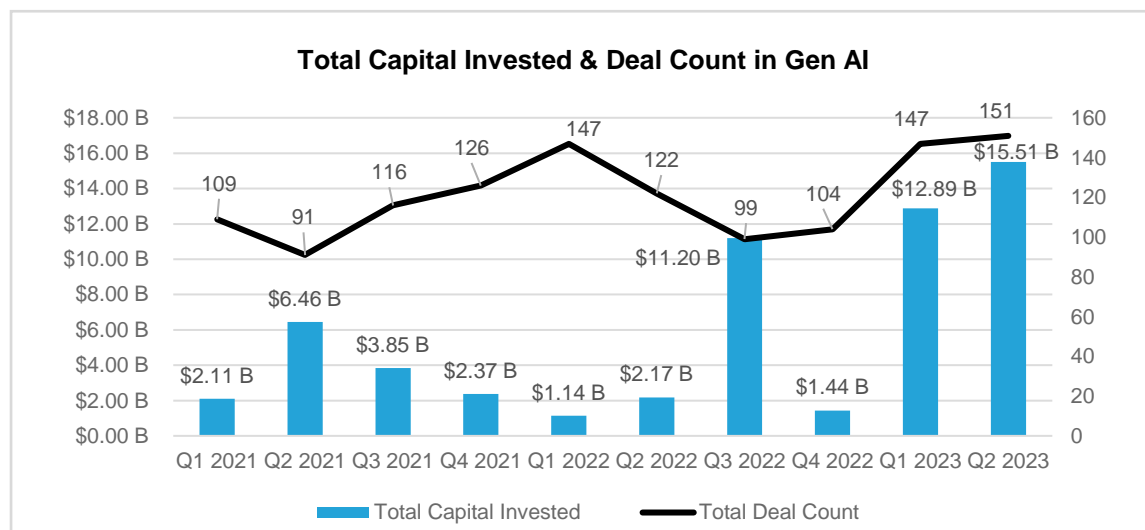
Generative AI Market Overview

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Generative AI Market Overview

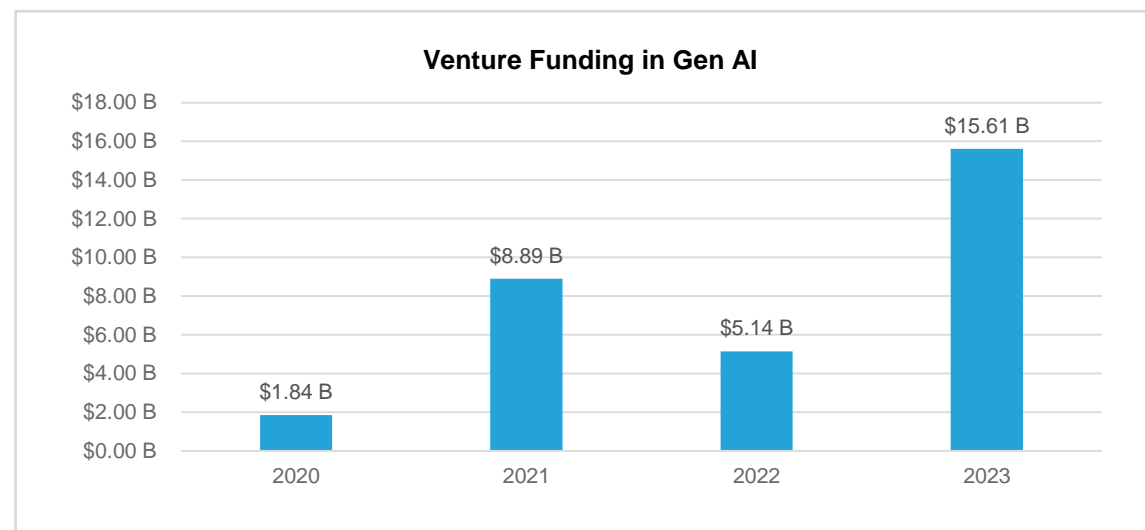
Development

- The early days of research on open-source large language models (LLMs) resulted in the launch of several important base models, such as OPT and BLOOM. However, these models were widely considered to perform quite poorly compared to closed-source, pre-trained models
- The introduction of open-source foundational Generative AI (Gen AI) models like ChatGPT in 2020 made the technology widely accessible across many users and functions for the first time
- In Q3 2022, artificial intelligence (AI) supplanted the VC hype from cryptocurrency with continued rapid advances in model performance and accessibility



Results

- Spurred organizations across every industry to seriously consider the potential opportunities and threats posed by these new capabilities
- The maturation of transformer-trained LLMs is likely to have wide-ranging impacts across many industries
- For enterprises, LLMs could have broad implications for many operational functions, including customer support, analytics, research & development, coding, and more
- As seen in the graphs below, capital flowing into Gen AI despite economic headwinds and the nature of rapidly advancing technology indicates the potential for explosive growth





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Generative AI in Healthcare Market Overview

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Generative AI in Healthcare Market Overview

Gen AI's Potential to be a Major Disruptive Force in Healthcare

Gen AI is a rapidly evolving ecosystem of tools with the potential to transform healthcare in unprecedented ways, ranging from assistive applications to medical coding to clinical applications. The healthcare industry currently faces many pressing issues, all of which Gen AI could potentially address if developed responsibly, diligently, and with the goal of augmenting human capabilities, not replacing them.

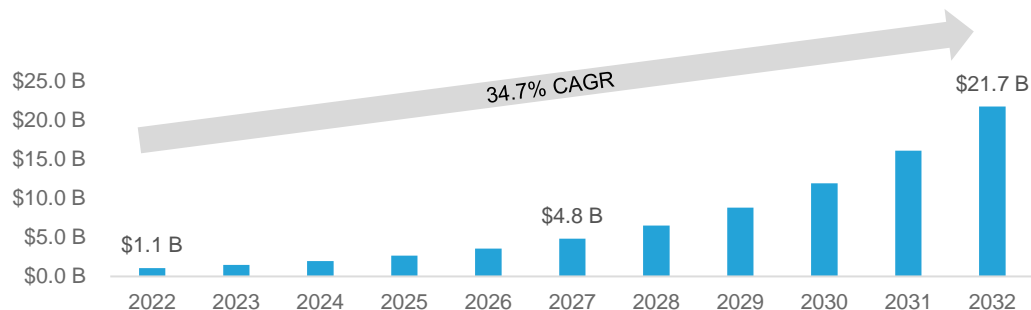
Scope of Report

- **Key statistics** supporting the rapid development of Gen AI and its potential to disrupt numerous healthcare sub-verticals
- Breakdown of the **most promising healthcare applications for investment** in Gen AI
- **Biggest risks** associated with utilizing Gen AI for healthcare applications across sub-verticals
- Highlight promising companies in different sectors of healthcare that are utilizing Gen AI in their products or services
- **VC and PE Outlook**

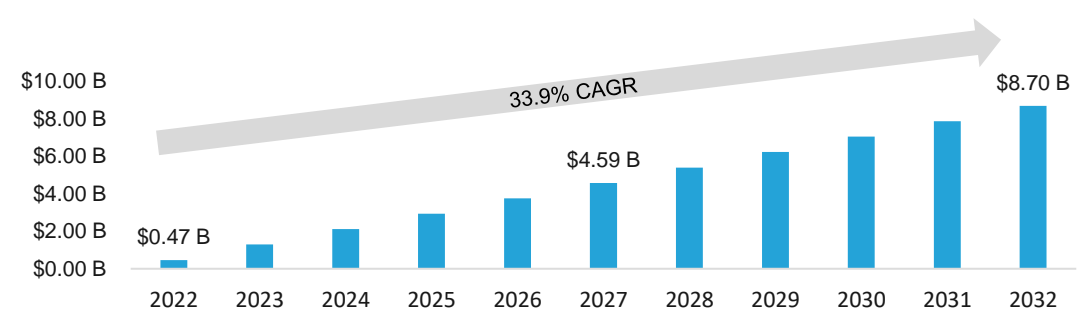
Market Opportunity

- Current trends showing a shortage of medical professionals
- An increasing percentage of physicians experiencing burnout
- Significant time spent on administrative tasks instead of clinical care
- Inefficiencies in revenue cycle management
- Exorbitant spending on the preparation, trials, and development of pharmaceuticals
- Immeasurable number of applications of Gen AI

Global Market Size Estimate of Gen AI in Healthcare



U.S. Market Size Estimate of Gen AI in Healthcare



Generative AI in Healthcare Market Overview

The new generation of LLMs heralded by GPT-4 will be **transformative for healthcare**—but that transformation will **proceed slowly**.

- This shift will start with applications that are **furthest away from clinical** use due to the healthcare industry being **heavily regulated**.
- As Gen AI capabilities expand, regulatory guardrails are put in place and it becomes more trusted by professionals in the medical field, **Gen AI will disrupt most sub-verticals within healthcare** and **attract a majority of VC and PE investment**.

Applications furthest from Medical Decision-Making

Potential Applications

- Patient engagement applications
- Electronic health record (EHR) summaries
- Clinical documentation
- Prior authorization request composition

Medically Adjacent Applications

Potential Applications

- Symptom triage
- Care navigation
- Wellness coaching
- Limited prior authorization review

Clinical Applications

Potential Applications

- Diagnosis
- Prescription
- Payer medical review along predefined care pathways
- Developing customized care plans for each patient



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Generative AI in Healthcare Key Statistics

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Generative AI in Healthcare Key Statistics

~75%

of companies have already implemented AI into their business strategies

~3%

of healthcare companies have differentiated AI strategies and can implement them operationally to maximize value

\$2B+

capital invested in AI-powered drug discovery in LTM

>10 Hours

are spent weekly by physicians completing paperwork and administrative tasks

\$1.2B+

capital invested in Digital Twins segment, a strong application of Gen AI

11.2%

Quarter-over-Quarter CAGR for Gen AI-related deal counts over the last four quarters and in line with 2021 deal levels

\$1.0B+

capital invested in LTM in the Assistive tech sector, a near-term solidified application of Gen AI in Healthcare

~50%

of new unicorn startups in 2023 are under the umbrella of Gen AI

\$6B+

total capital raised by clinician-facing Gen AI startups, including applications in clinical decision support, notetaking, workflow automation, and more



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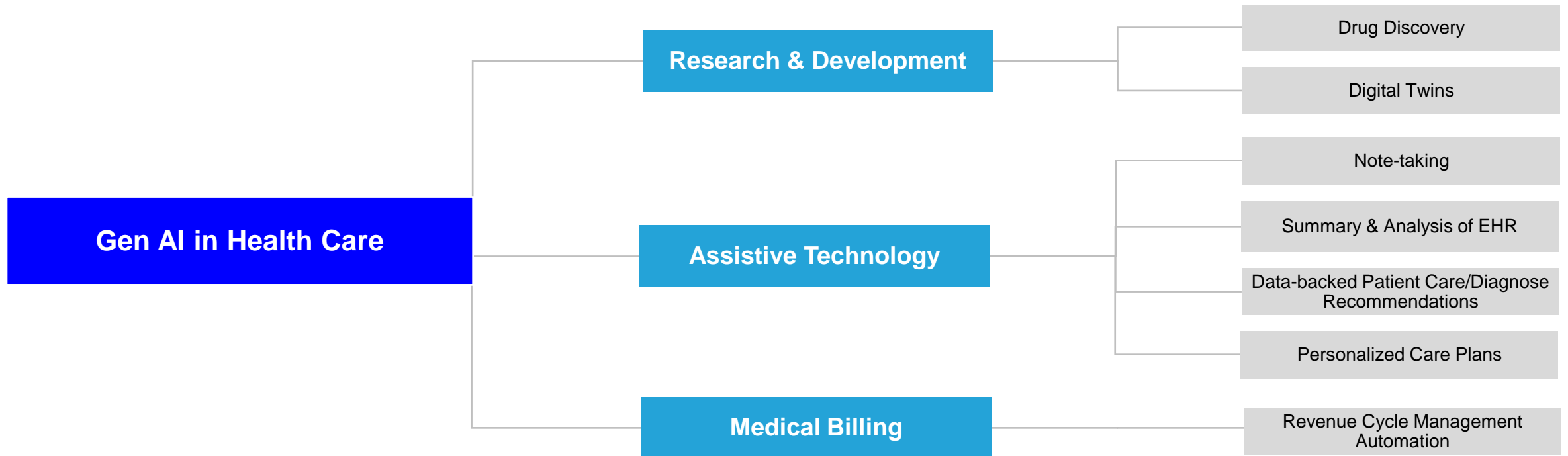
Generative AI Applications in Healthcare

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Generative AI Applications in Healthcare

Background for Gen AI Applications in Healthcare

- Due to the heavily regulated nature of the healthcare industry, the adoption of Gen AI applications will be gradual and require significant focus on transparency, credibility, and clarity
- Gen AI has indeterminable disrupting potential across nearly every sub-vertical in every industry, so not only healthcare tech but also many other subsectors of healthcare will be dominated by Gen AI-related startups and companies in the coming years
- It is important to note, especially in the healthcare industry where significant liabilities are inherent, that Gen AI technology is meant to be used to augment human intelligence, not replace it




Generative AI Applications in Healthcare

Research & Development		
LTM Capital Invested in Space \$2B+	Drug Discovery	Top 20 Biopharmas Avg. Cost/ New Drug Development \$2.3B
Drug Target Identification & Selection	Compound Screening and Design	Clinical Research
<ul style="list-style-type: none"> Initial identification of a suitable biological target for drug candidates Analyze and synthesize information from existing scientific research, publications, and more 	<ul style="list-style-type: none"> Predicting the chemical properties and bioactivity of compounds Modeling 3D structures of target proteins Predicting efficacy and potential adverse events based on the compound's makeup and affinity for a target 	<ul style="list-style-type: none"> Analyze vast amounts of data from both interventional and non-interventional studies Inform the design and efficiency of non-traditional trials, such as decentralized clinical trials and trials using real world data.
Results	Results	Results
<ul style="list-style-type: none"> Improves the efficiency and effectiveness of drug development Reduces expenses and time needed to prepare for clinical trials 	<ul style="list-style-type: none"> Streamlines identification process of promising compounds for drug development Reduces expenses & time needed to prepare for clinical trials 	<ul style="list-style-type: none"> Reduces variability, increases study power, and properly stratifies patients Reduces expenses & time needed to prepare for clinical trials

Digital Twins

Definition: Twins created from profiles of existing patients that can be used as additional test points in simulations for clinical trials

Healthcare Gen AI-powered Company Highlight



Developer of a Gen AI-driven platform designed to replicate the characteristics of patients in trials to enable smaller, faster studies, built on a **combination of AI and historical data**

★ **The product is not an AI model; it is a clinical trial model, and there are minimal competitors in the AI driven late-stage clinical trial applications space.**

Effects

- Reduces the time needed to develop new medicines
- Enables healthcare companies to provide life-saving therapies to patients in need

Raised to Date
\$85.65M

Post-Money Valuation
\$265.00M

LTM Capital Invested in Space
\$1.2B+

Generative AI Applications in Healthcare

Assistive Technology

Overview

- ★ Healthcare Assistive Technology is the most pressing and ripe sub-sector for Gen AI disruption due to:
 - The lack of regulation relative to other healthcare sub-sectors
 - The demand for technology to assist medical professionals with administrative tasks
 - The current trends detailing significant physician burnout and shortages

LLMs

- The most relevant assistive applications of Gen AI in healthcare are LLM-driven
- Language models, with proper guidance, can be prompted to produce factual information that is grounded in real-world data
- LLMs can scan through data curated by medical practitioners and derive fact-driven analysis & insight

Important Investor Consideration

- It is crucial to keep in mind that LLMs are only as reliable as the data they are trained on
- When evaluating companies for investment, ensure that proper due diligence is being done and only unbiased data is being used to develop an LLM

**LTM Capital
Invested \$1.0B+**

**Time Spent By
Physicians on
Admin Tasks/Week
10+ Hours**

**Total Capital
Invested
\$6.0B+**

Uses

- Allow medical practitioners to easily gain insights from emergency department admissions data
- Prepare patients for their first appointment
- Personalize communications about treatment plans
- Provide guidance about medication usage
- Assist with other efforts to improve patient engagement and retention, all backed by specific data about a patient
- ★ Reduces note-taking and charting time by 30–40%, allowing physicians to focus on clinical tasks and avoid premature burnout

Generative AI Applications in Healthcare

Assistive Technology

Overview

- Many major global tech players have entered the assistive technology space through the release of LLMs for healthcare applications
- To understand how Gen AI will shape the healthcare assistive technology space, it is important to be aware of what direction the world's top tech innovators are heading

Implications

- Major tech companies are rapidly entering this space, which signals an opportunity for disruption
- Companies that have access to more resources and data can capitalize on the large amounts of data needed to train a reliable LLM



AWS HealthScribe

HIPAA-eligible service that combines speech recognition and Gen AI

- To build clinical applications that automatically generate preliminary clinical notes by analyzing patient-clinician conversations
- To reduce documentation time, boost medical scribe workflow, and provide patients with appointment highlights



Microsoft's Bio-GPT

Advanced Language Model developed by Microsoft, which is specifically trained on biomedical data

- To perform tasks such as answering biomedical questions, extracting relevant data, and generating text relevant to biomedical literature
- To synthesize and summarize vast amounts of data to help researchers gain new insights



Google's Med-PaLM 2

Harnesses the power of Google's LLMs to generate responses to medical questions and perform administrative tasks

Generative AI Applications in Healthcare

Medical Billing

Gen AI is at the forefront of the healthcare information technology space and is being used to simplify and automate the overly complicated healthcare revenue cycle that has been the bane of smaller practices and hospital systems alike for years.

AI-Powered Revenue Cycle Management Overview

Primary Uses

- Streamline generation process of prior authorization submissions and denial appeals
- Analyze historical data around scheduling, registration, charge capture, billing, and collections to reduce the cost to collect and predict denials

Risks

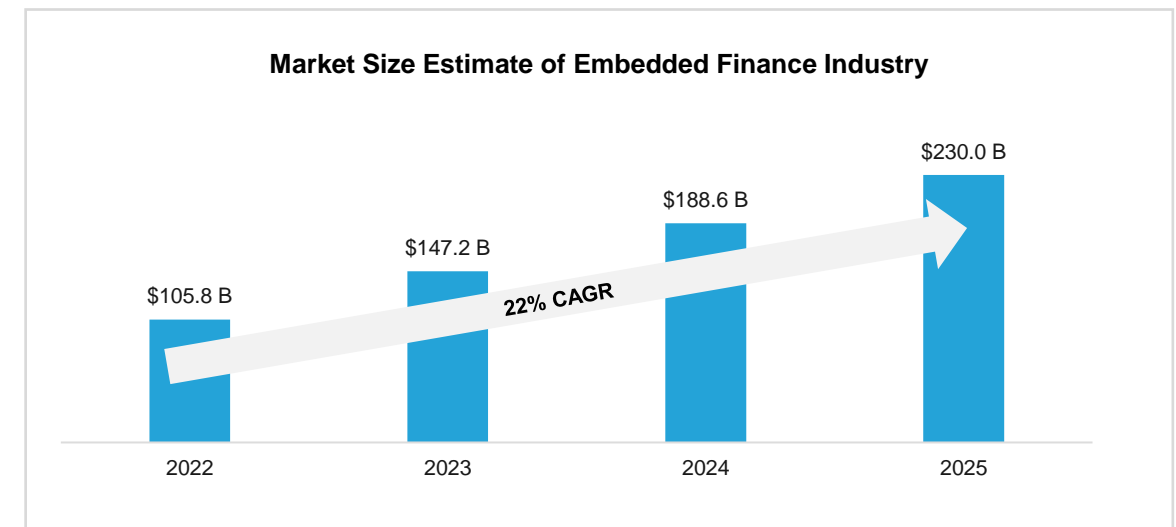
- Many practices and hospitals have:
- Limited financial flexibility
 - Data silos and archaic technological infrastructure
- Investors must ensure that the Revenue Cycle Management (RCM) solution can be broadly implemented given current technological capabilities**

Differentiating Factors

- Capable of doing the work of experienced coders for complex claims
- Predictive analytics capabilities to identify the most collectible claims
- End-to-end functionality
- Easily adopted by hospitals and systems regardless of back-office infrastructure

Market Demand Factors

- RCM in healthcare is extremely complicated and requires experienced coders to process complex claims
- Automated billing cuts more than half the time needed to manually process claims
- ~25–30% of medical practice income is lost due to inefficient or improper collection practices





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Generative AI in Healthcare Market Outlook

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Generative AI in Healthcare Market Outlook

General Factors

- Lack of Gen AI companies with predictable growth, risk, and stable cash flow profiles
- Apprehensive company owners and investors due to broad economic headwinds
- General lack of deal flow across transaction types
- Introduction of open-source Gen AI models
- Flexible capabilities of Gen AI across industries and functions
- Gap between supply and demand in Gen AI due to boom in AI startups coupled with curbed investor appetite

Relevant Market Effects

- Health tech has only experienced a ~10% decrease in deal activity in H1 2023, one of the smallest declines of any industry or sub-sector
- Abundant private equity dry powder in reserve
- Valuations are generally down from the M&A craze of 2021 but are in line with pre-COVID historical numbers at the lower to middle market level
- Hot AI venture capital market

Potential Results

- Healthcare technology subsector experiences a dynamic recovery fueled by Gen AI
- Valuations become less uncertain as cash flows, working capital, and capital structures stabilize and bridge the gap between the current M&A supply and demand
- Rapid development and advancement of Gen AI from an influx of VC-backing
- Gen AI-centered private equity deals will boom in the coming years due to the sizeable amount of sidelined deals and abundant deployable capital



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Generative AI in Healthcare Regulatory Outlook

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Generative AI in Healthcare Regulatory Outlook

As society at large grapples with the possibilities and pitfalls of Gen AI, federal entities are hastening to find the best way to regulate the rapidly developing space without suppressing innovation. Unfortunately for them, Gen AI is growing at a much faster rate than the government can rein in, and as a result, most legislation will likely be retrospective and convoluted in nature.

Announced Legislation & Proposed Framework

National AI Commission Act(2023):

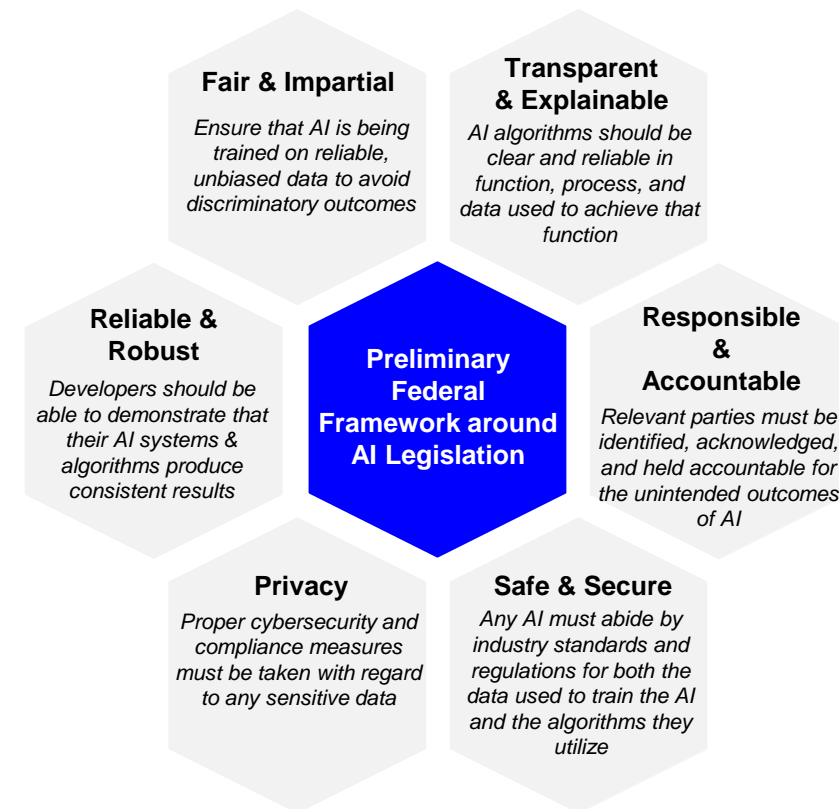
- Bipartisan, bicameral legislation to create a national commission to focus on regulating AI
- The Blue-ribbon committee will review the United States' current approach to AI regulation, make recommendations on any new office or governmental structure that may be necessary and develop a comprehensive risk-based framework for AI
- Comprised of experts from civil society, government, industry, and labor, along with those with sufficient technical expertise

SAFE Innovation Framework for AI (2023):

- Regulatory framework spearheaded by Senate Majority Leader Chuck Schumer detailing five central pillars to abide by
- Five Pillars: Security, Accountability, Foundations (beneficial to current society), Explainability (clarity in function), and Innovation
- The purpose is to encourage responsible, ethical AI innovation while not stifling growth

Key Takeaway

Investors must be cautious when evaluating companies using Gen AI systems & algorithms and verify that a company is hedging against their risk by ensuring that they are following proper internal measures to abide by the government's proposed framework.





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Generative AI in Healthcare PE & VC Outlook

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Generative AI in Healthcare PE & VC Outlook

Venture Capital

Gen AI has propelled into the investment scene since the release of open-source LLMs in 2020 due to its nearly limitless applications, highly efficient algorithms, and disruptive potential across many sub-verticals.

- Venture Capital investors have been active in the Gen AI space, investing \$15B+ in Gen AI startups in 2023 to date
- Venture funding pouring into Gen AI shows no signs of slowing down, despite significant economic headwinds in the past few years

More than 30% of the capital circulating in the AI space has come from VC since 2018.

Private Equity

Private equity buyers have been largely inactive in Gen AI overall due to:

- Lack of Gen AI companies that have stable cash flows, have tested their algorithms comprehensively in practical settings, and have predictable growth trajectories
- Economic headwinds discouraging companies from leveraging themselves for acquisitions, leading to a general lack of deal flow
- Minimal official regulatory measures surrounding AI, so PE firms can evaluate risk when considering an investment

Less than 6% of Gen AI investments have been made by private equity firms since 2018.

Private equity will look for investment into Gen AI in healthcare once the factors listed above are addressed.

\$15B+

Venture funding raised in 2023 for Gen AI startups

~\$15B

Venture Funding in 2023 for Healthcare technology startups

Key Investment Considerations

Due to the uncertainty surrounding how Gen AI will develop, how it will be used practically, how it will change the current job market, and how it will be federally regulated to uphold national standards, it is critical that investors conduct proper due diligence when putting money into Gen AI startups or companies.

General Considerations

- The official regulatory framework surrounding the development of Gen AI has not been finalized, so it is crucial to keep up-to-date on the federal legislation surrounding AI when evaluating companies for investment as well as factor in current preliminary frameworks

Healthcare Considerations:

- Ensure that AI algorithms are HIPPA compliant
- Medical processes and care are heavily regulated in healthcare due to the significant liabilities present when dealing with patients, so AI must follow all relevant regulations like human physicians
- Hospitals often have outdated technological infrastructure, so it is important that any Gen AI algorithm can be feasibly adopted by hospitals and systems on a broader scale
- Keep in mind that the lack of regulation relative to the rest of the healthcare industry around note-taking, summary and analysis of EHR, and diagnosis recommendations will likely result in assistive technology being widely implemented before 2025



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Generative AI in Healthcare Key Takeaways

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Generative AI in Healthcare Key Takeaways

Gen AI in Healthcare has been the topic at the forefront of the majority of recent discussions about innovation in healthcare, and for good reason. Despite the large amounts of venture capital funding being poured into Gen AI in healthcare, the adoption of Gen AI into applications closer to clinical use will only occur after the algorithms have gained considerable trust by hospital systems and physicians, as well as after federal guardrails have been put in place by regulating entities.

Key Takeaways

- **Early widespread adoption**, meaning before the end of the year 2025, of Gen AI in healthcare by hospital systems and physicians **will almost exclusively be in the assistive technology space**
- Due to the heavily regulated nature of the healthcare industry, investors must consider how feasible Gen AI products and services are in terms of implementation, given the current infrastructure and existing policy in the relevant vertical
- **Ever-changing general regulatory guidelines around AI will be a crucial factor** in Gen AI buying decisions, as buyers should be looking to hedge against the risks presented by the potential of Gen AI to generate misinformation, disinformation, and biased analyses through prejudice in training data while also capitalizing on the potentially explosive nature of Gen AI companies and startups
- Given the relatively new emergence of Gen AI, the hot Gen AI VC market currently, and the widespread potential of Gen AI, later-stage **investors must keep their finger on the pulse of new and emerging Gen AI startups** in order to find the most promising companies for investment
- After the assistive technology space is upended by the implementation of Gen AI to automate administrative and internal processes, sub-verticals farther away from healthcare, such as drug discovery, medical billing, medical imaging, and more, will be disrupted. Early-stage investors currently putting money into these Gen AI applications **should carefully vet a company's growth potential and risk profile, as well as be wary of companies claiming to be the cure-all solution in the relevant vertical**
- As a developing Gen AI market, fueled by abundant VC funding, rapidly expands there will **likely be a Gen AI M&A boom after 2025** once the national economy regains stability from current economic headwinds that have led to massive amounts of sidelined deals and PE dry powder in reserve. Once investors regain confidence in the markets, **expect Gen AI companies to greatly bolster the economic recovery**



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Significant Generative AI Partnership

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Significant Generative AI Partnership

Date	Segment	Partnership	Description
8/2/2023	Healthcare Administrative	Cognizant and Google Cloud	Cognizant and Google Cloud partnered for healthcare AI, automating tasks, cutting costs, and prioritizing security. Innovating through responsible AI practices, they focused on administrative processes and patient engagement
8/1/2023	Hospice EMR	4L Data Intelligence and Hospice Dynamix	4L Data Intelligence and Hospice Dynamix united for accurate patient length of stay predictions. Merging AI with real-time EMR data optimized revenue forecasting and compliance, addressing healthcare industry challenges
7/17/2023	Healthcare Enterprise	Google and Mayo Clinic	Google Cloud and the Mayo Clinic utilized Gen AI for patient data access. Enterprise Search on Gen AI App Builder simplified information retrieval, easing administrative burden and fostering responsible AI adoption in healthcare
6/14/2023	Healthcare Administrative	MetLife and Lyra	MetLife and Lyra Health partnered to offer employees mental health services during disability claims. MetLife integrated Lyra's global provider network using AI-powered technology to enhance well-being support, address rising mental health concerns, and promote holistic recovery for employees
5/26/2023	Drug Discovery	Moderna and IBM	Moderna and IBM harnessed Gen AI and quantum computing for drug development. MoLFormer predicted molecule properties, leveraging IBM's quantum expertise to achieve life sciences breakthroughs unattainable via classical systems
4/29/2023	Medical Imaging	Subtle Medical and Getz Healthcare	Getz Healthcare partnered with Subtle Medical for AI-based medical imaging solutions in Australia and New Zealand. SubtlePET™ improved PET image quality, while SubtleMR™ enhanced MRI efficiency, benefiting patients and institutions
4/19/2023	Medical Imaging	Segmed, NVIDIA, and RadImageNet	Segmed collaborated with NVIDIA and RadImageNet for synthetic medical imaging data. State-of-the-art Gen models advanced AI algorithms, refining diagnoses and safeguarding patient privacy via the Segmed Insight platform

Significant Generative AI Partnership

Date	Segment	Partnership	Description
4/18/2023	Healthcare Administrative	Amazon AWS and 3M Health Information	3M Health Information Systems teamed with AWS for enhanced clinical documentation. Gen AI and ML automated precise clinical notes, alleviating administrative burdens and enhancing patient care delivery
4/17/2023	Electronic Health Records	EPIC and Microsoft	Microsoft and Epic integrated the Azure OpenAI Service with Epic's EHR software. AI-driven solutions improved patient care, productivity, and financial integrity while respecting responsible AI principles
4/17/2023	Medical Imaging	Amazon AWS and Philips	Philips and AWS enhanced healthcare through cloud-based Philips HealthSuite Imaging. Optimizing image access and AI-driven clinical support, they streamlined workflows and diagnostics, leveraging Amazon Bedrock for advanced radiology applications
2/28/2023	Drug Discovery	Tempus and Pfizer	Tempus and Pfizer collaborated to advance AI-driven oncology drug development. Pfizer gained access to Tempus' AI platform, data library, and R&D capabilities, accelerating precision medicine advancements in the field
1/23/2023	Medical Supply Chain	Cardinal Health and Palantir	Cardinal Health and Palantir optimized health system purchasing with AI. Palantir's Foundry system enhanced pharmaceutical supply chains by predicting drug inventory needs for better medication access
1/9/2023	Drug Discovery	ConcertAI and Caris Life Sciences	ConcertAI and Caris Life Sciences united for oncology research. Combining molecular-rich data with clinical insights, they expedited drug development and precise patient care strategies in oncology
3/16/2022	Medical Imaging	Verily and Lumea	Verily and Lumea enhanced prostate cancer diagnosis. AI algorithms in digital pathology improved assessment accuracy, enabling faster analysis and treatment decisions



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Healthcare AI M&A Activity

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Healthcare AI M&A Activity

Announced Date	Target Name	Description	Total Transaction Value (\$M)	Buyer/Investor	Website
8/14/2023	Populi	Company offering healthcare analytics platforms for patients, consumers, and healthcare providers, now part of a larger healthcare corporation	52	Definitive Healthcare Corp. (NasdaqGS:DH)	populi.ai
7/20/2023	Polaris AI	Developer of an AI-powered platform predicting patient volume and staffing needs, enhancing clinical efficiency	-	Aya Healthcare, Inc.	polarishealth.ai
7/6/2023	REALM IDx	Health intelligence and visualization platform utilizing genetic, protein, and tissue data for insights, with collaboration in genetics	220	Konica Minolta, Inc. (TSE:4902)	REALMIDx.com
5/22/2023	Melax Technologies	Medical subsidiary specializing in technology solutions, operating under Intelligent Medical Objects	-	Intelligent Medical Objects, Inc.	melaxtech.com
5/4/2023	Peak Health	Health and wellness company offering AI-powered sleep coaching through wearable data	-	BetterUP, Inc.	crescent.co
4/26/2023	Genivity	AI software platform for advisors, aiding client engagement in health planning, aligned with Lumiant	-	Lumiant Pty Ltd	www.genivity.com
2/9/2023	Caption Health	Developer of AI software for ultrasound exams	-	GE HealthCare Technologies Inc. (NasdaqGS:GEHC)	www.captionhealth.com
1/27/2023	Deep Lens	Developer of a healthcare data platform designed to match patients to suitable clinical trials and precision therapies	-	Paradigm	www.deeplens.ai
1/10/2023	Hospital IQ	Provides intelligent automation solutions for hospital operations optimization	-	LeanTaaS Inc.	-
10/11/2022	StoCastic	Offers AI evidence-based decision support for healthcare settings	-	Beckman Coulter, Inc.	www.stocastic.com

Healthcare AI M&A Activity

Announced Date	Target Name	Description	Total Transaction Value (\$M)	Buyer/Investor	Website
10/6/2022	CareSight	Delivers advanced reporting and analytics solutions for healthcare risk reduction	-	Lone Star Communications, Inc.	www.caresight.com
10/5/2022	Arterys	Develops SaaS-based AI analytics for medical imaging diagnostics	-	Tempus Labs, Inc.	arterys.com
8/3/2022	CitiusTech	Offers healthcare technology services and solutions, including analytics and AI-driven platforms	-	Bain Capital Private Equity, LP	www.citiustech.com
3/31/2022	Intelligent Medical Objects	Clinical terminology company offering solutions for standardized data access	-	Thomas H. Lee Partners, L.P.	www.imohealth.com
3/21/2022	Presidio Health	Healthcare tech company automating medical chart acquisition and feedback	-	DeliverHealth Solutions LLC	presidiohealth.com
3/14/2022	Intellivisit	AI platform enabling remote patient triage and treatment recommendations	-	Merchant Medicine, LLC	www.intellivisit.com
1/6/2022	Soundmind Intelligence	AI voice assistants for senior care providers to enhance assistance	-	Speak2 Family Inc.	www.soundmindinc.com
1/5/2022	Inteneural Networks	Medical high-tech company specializing in AI-based medical image analysis	20.93	Surgalign Holdings, Inc. (OTCPK:SRGA.Q)	www.inteneural.com
11/23/2021	Technology Partners	Provider of integrated practice management software for healthcare, including billing, EHR, and automation solutions	-	Marlin Equity Partners, LLC	www.imagineteam.com
9/7/2021	Gauss Surgical	Medical device company delivering real-time blood monitoring solutions with AI for surgical and obstetric applications	160	Stryker Corporation (NYSE:SYK)	www.gausssurgical.com



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Healthcare AI Private Equity Deals

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Healthcare AI Private Equity Deals

Announced Date	Target Name	Description	Total Transaction Value (\$M)	Buyer/Investor	Website
8/4/2023	SpIntelx (PredxBio)	A computational pathology company specializing in spatial intelligence software for cancer diagnosis from tissue sections	-	-	www.spintellx.com
7/17/2023	Bluesight	Innovator of a medication intelligence platform aiding hospital pharmacies in drug management, diversion detection, and cost optimization	-	Thoma Bravo, L.P.	bluesight.com
6/22/2023	Graphium Health	Developer of cloud computing platforms for medical professionals, including analytics and electronic medical record solutions	-	CRH Medical Corporation	www.graphiumhealth.com
6/15/2023	4L Data Intelligence	Data intelligence platform with healthcare and insurance solutions targeting fraud prevention and service enhancement	1.5	-	www.4ldata.com
6/9/2023	PhAST	AI technology focused on antibiotic resistance, aiding clinical decisions, hospital workflows, and drug development	1.01	InnoTherapy, Inc. (KOSDAQ:A246960)	phastdiagnostics.com
5/25/2023	SafelyYou	AI software for Alzheimer's care, using video analysis to reduce falls and hospitalizations	30	Horizon Technology Finance Management, LLC; Horizon Technology Finance Corporation (NasdaqGS:HRZN)	www.safely-you.com
4/4/2023	ForeSee Medical	AI-based risk adjustment software for value-based healthcare reimbursement, utilizing diverse medical data sources	4	-	foreseemed.com
1/31/2023	CurveBeam AI	Provider of AI-driven imaging platforms for orthopedics, empowering clinical decisions and bone health assessments	17.62	SG Hiscock & Company Limited; Acorn Capital Limited; Ilwella Pty Ltd; Karst Peak Capital Limited; Firetrail Investments Pty Ltd; Frazis Capital Partners; Tenmile Ventures Pty Ltd.	curvebeamai.com

Healthcare AI Private Equity Deals

Announced Date	Target Name	Description	Total Transaction Value (\$M)	Buyer/Investor	Website
1/19/2023	U.S. Caris MPI	Develops innovative diagnostic technologies for oncology and other medical fields	400	-	www.carislifesciences.com
1/11/2023	Paige.AI	Offers AI-powered digital diagnostics and predictive tests for oncology treatment	-	Microsoft Corporation (NasdaqGS:MSFT)	paige.ai
12/1/2022	Prealize Health	Uses AI predictive analytics to identify high-cost patients for early interventions	11.16	-	www.prealizehealth.com
11/17/2022	Flashback Technologies	Develops AI-based solutions for vital sign transformation	-	-	impactvitals.com
10/12/2022	Healthtalk A.I	Develops AI-assisted patient engagement solutions	-	-	www.healthtalkai.com
10/6/2022	Alivia Capital	Provides AI-powered fraud detection for healthcare claim payers	-	Council Capital; HEP Management Corporation	www.aliviaanalytics.com
8/2/2022	CareTrack Health	Telecare solution for Medicare patients, integrating AI for care coordination and patient control	2.5	-	caretrack.com
5/31/2022	L7 Informatics	Lab informatics solutions streamlining scientific processes across industries	38	Banneker Partners, LLC	l7informatics.com
5/31/2022	Deep 6 AI	AI-driven platform matching patients with clinical trials using medical data	-	Novo Holdings A/S	deep6.ai

Healthcare AI Private Equity Deals

Announced Date	Target Name	Description	Total Transaction Value (\$M)	Buyer/Investor	Website
3/29/2022	ConcertAI	Cloud-based healthcare software integrating real-world data and AI for precision oncology	150	Sixth Street Partners, LLC	www.concertai.com
3/9/2022	Perthera	Personalized medicine firm offering AI analysis for tailored cancer treatment	4.47	-	perthera.com
1/10/2022	mPulse Mobile	AI-driven messaging platform for healthcare engagement and management	-	HLM Venture Partners; SJF Ventures; OCA Venture Partners, LLC; Bonfire Ventures Management, LLC; PSG Equity L.L.C.; Echo Health Ventures, LLC; Optum Ventures	mpulsemobile.com
12/1/2021	Iodine Software	AI-based clinical documentation software improving revenue cycle integrity for hospitals	-	Advent International Corporation	iodinesoftware.com
11/29/2021	Cogito Corporation	Behavioral analytics software utilizing AI voice analysis for real-time guidance to enhance sales, service, and care professionals' performance	50	-	www.cogitocorp.com
11/2/2021	WhiteSpace Health	Offers cloud-based healthcare intelligence solutions for providers, focusing on practice management, operations, finance, and compliance	18	Omega Healthcare Management Services Private Limited	whitespacehealth.com
9/3/2021	Suki AI	Developer of AI-enabled voice assistant software aiding doctors in managing electronic health records, patient data, and actionable plans	55	VR Adviser, LLC; Philips Venture Capital Fund BV; Flare Capital Partners; Breyer Capital, LLC; March Capital Venture Management Services, LLC; Gaingels, LLC; InHealth Ventures Limited	www.suki.ai



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Generative AI in Healthcare Appendix

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Generative AI in Healthcare Relevant Terminology

1

Assistive Technology (in AI): Any item, piece of equipment, software program, or product system that is used to increase, maintain, or improve the functional capabilities of persons with disabilities

2

Bias: A type of error that can occur in a large language model if its output is skewed by the model's training data. For example, a model may associate specific traits or professions with a certain race or gender, leading to inaccurate predictions and offensive responses.

3

Chatbot: A chatbot is a program that can simulate conversations with human users through text or voice commands. Chatbots can understand and generate human-like responses, making them a powerful tool for customer service applications.

4

Cognitive Computing: Cognitive computing is an AI field focusing on developing systems that imitate human cognitive abilities such as perception, learning, reasoning, and problem-solving.

5

Data Mining: Data mining is the process of acquiring valuable knowledge from large datasets. It uses statistical analysis and machine learning techniques to identify patterns, relationships, and trends in data to improve decision-making.

6

Deep Learning: Deep learning is a branch of AI that uses artificial neural networks with multiple layers (interconnected nodes within the neural network) to learn from vast amounts of data. It enables machines to perform complex tasks such as natural language processing and image & speech recognition.

7

Emergent behavior: Unexpected or unintended abilities in a large language model, enabled by the model's learning patterns and rules from its training data. For example, models that are trained on programming and coding sites can write new code. Other examples include creative abilities like composing poetry, music, and fictional stories.

8

Generative AI: Technology that creates content—including texts, images, videos, and computer codes—by identifying patterns in large quantities of training data and then creating original material that has similar characteristics. Examples include ChatGPT for text and DALL-E and Midjourney for images.

9

Hallucination: A well-known phenomenon in large language models in which the system provides an answer that is factually incorrect, irrelevant, or nonsensical because of limitations in its training data and architecture

Generative AI in Healthcare Relevant Terminology

1

Large Language Model (LLM): A type of neural network that learns skills—including generating prose, conducting conversations, and writing computer code—by analyzing vast amounts of text from across the internet. The basic function is to predict the next word in a sequence, but these models have surprised experts by learning new abilities.

2

Machine Learning: Machine learning is a branch of AI and computer science that focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its accuracy.

3

Multimodal AI: A form of AI that can understand and work with multiple types of information, including text, images, speech, and more. This is powerful because it allows AI to understand and express itself in multiple dimensions, giving both a broader and more nuanced understanding of tasks.

4

Natural Language Processing: Techniques used by large language models to understand and generate human language, including text classification and sentiment analysis. These methods often use a combination of machine learning algorithms, statistical models, and linguistic rules.

5

Neural Network: A mathematical system, modeled on the human brain, that learns skills by finding statistical patterns in data. It consists of layers of artificial neurons. The first layer receives the input data, and the last layer outputs the results. Even the experts who create neural networks don't always understand what happens in between.

6

Parameters: Numerical values that define a large language model's structure and behavior, like clues that help it guess what words come next. Systems like GPT-4 are thought to have hundreds of billions of parameters.

7

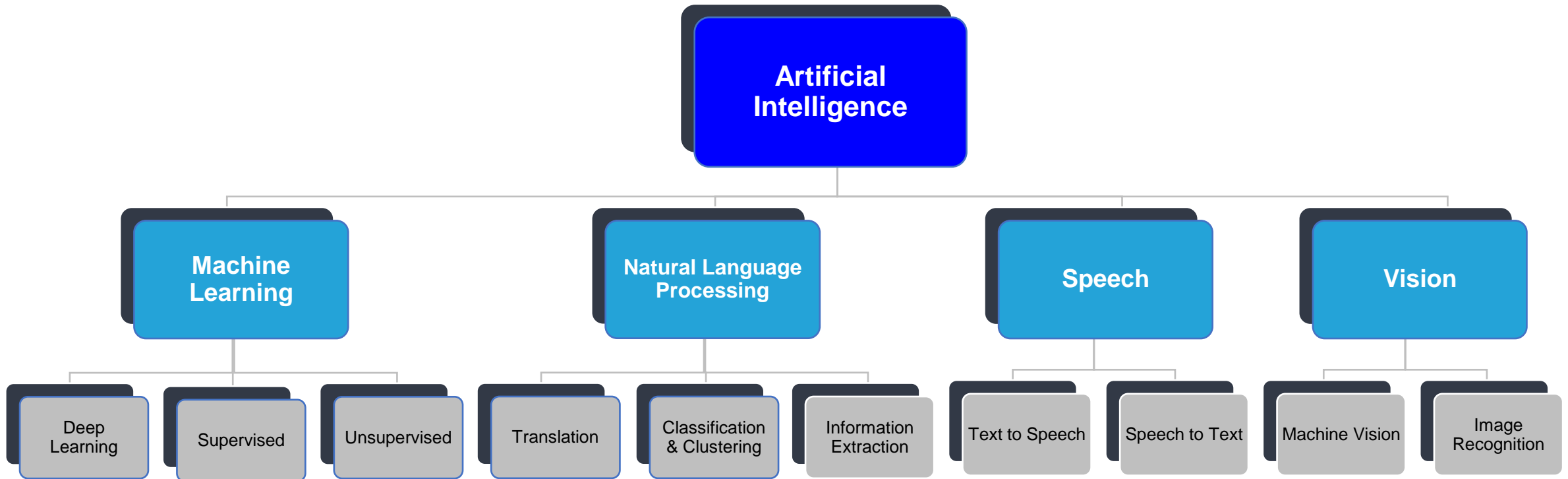
Reinforcement learning: A technique that teaches an A.I. model to find the best result by trial and error, receiving rewards or punishments from an algorithm based on its results. This system can be enhanced by humans giving feedback on its performance in the form of ratings, corrections, and suggestions.

8

Training Data: A collection of information—text, image, and sound—curated to help AI models accomplish tasks. In language models, training datasets focus on text-based materials like books, comments from social media, and even code.

Generative AI in Healthcare – Basic Umbrella

Gen AI is an application of deep learning that uses natural language processing to generate images, music, speech, code, video, or text while it interprets and manipulates pre-existing data.





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