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From code to cure, how Generative AI can reshape the health frontier:

Unlocking new levels of efficiency, effectiveness, and innovation

Contents

Executive summary 3

Section 1: The shifting health care market landscape 5

Section 2: Navigating the obstacles and opportunities for Generative AI in health care 8

Section 3: Unlocking the value of Generative AI 12

Section 4: Activating Generative AI for your organization 16

Striking the right balance for success 20

Executive summary

Generative artificial intelligence (AI) has begun to unleash digital waves across industries, but its promise to transform health is only just beginning. The health care ecosystem is grappling with interlocking crises, from labor shortages and clinician burnout to declining profitability and worsening health outcomes, particularly in underserved communities. The urgent need for a transformative, enterprise approach centers on leveraging new groundbreaking technology while reintroducing genuine care and trust into health care practices, both for the sustainability of health care organizations and the well-being of consumers.

Generative AI technology has the potential to address these existential crises, among enterprise and direct-to-consumer applications alike. Today, consumers are already using Generative AI for health care needs, and health care leaders have already expressed activity, investment, and plans for Generative AI.

According to the Deloitte Center for Health Solutions, and the 2024 Life Sciences and Health Care Generative AI Outlook Survey:

75%
of leading health care companies are already experimenting with Generative AI or attempting to scale across the enterprise

82%
currently have or plan to implement governance and oversight structure for Generative AI

92%
of leaders overwhelmingly see promise for Generative AI to improve efficiencies and

65%
of leaders see promise to enable quicker decision-making

In recent years, natural language processing (NLP) and machine learning (ML)—subsets of AI technology—have gained traction in a host of health care use cases, ranging from clinical trial patient recruitment to virtual physician assistants. New Generative AI models have demonstrated unprecedented capabilities and stakeholder interest as a significant expansion in natural language generation, summarization, translation, insight retrieval, reasoning, and management of unstructured, unlabeled data. This technology has tremendous untapped potential to deliver an immediate stepwise improvement, and exponential long-term improvement, to the health care ecosystem. It may help address the health care industry's greatest pain points by democratizing knowledge, increasing interoperability, accelerating discovery, and enabling true personalization.

Perhaps most importantly, Generative AI can either deepen and restore trust or exacerbate mistrust and introduce new skepticism among consumers and health care stakeholders alike.

Generative AI is a solution for many of health care's major challenges of workforce, margins, trust, and value with immediate opportunities in driving administrative efficiency, hyperpersonalizing the care experience, and creating digitally enabled enterprise with low-code access to data and insights as well as frictionless user interfaces. To address these challenges successfully, however, Generative AI must be designed, deployed, and scaled using a transformational approach that incorporates organizational change, ethics, and trust.

We have predicted this seismic shift enabled by AI and radically interoperable data for several years, articulating that consumers and clinicians alike are demanding new technologies to solve age-old problems.[1] Generative AI has the potential to catalyze trust and power the broader Future of Health™ transformation—the shift from sick care and reactionary treatment to a well-being and prevention focus—by helping enable radically interoperable data through open, secure platforms and empowering consumers. In helping create this future, Generative AI can potentially eliminate significant portions of the $1 trillion in wasted health care spending.[2] Various projections estimate that Generative AI, at large, may contribute up to $7 trillion in global GDP over the next 10 years.[3] As health care–specific Generative AI models and platforms become more widespread, however, business leaders must identify threats to their market position and retain a competitive edge. Generative AI will be used in a way to disrupt today's care models and create new ways to deliver medicine. These changes could present challenges to incumbents, as well as current business models and workflows.

What might this disruption look like?

For health care providers, this is a golden opportunity to embrace and integrate democratized, personalized medical information into their practice. Primary care practitioners could be equipped with cross-disciplinary, real-time knowledge spanning medical, drivers of health, social, and professional specialties. And modern-day doctor's appointments could be streamlined, with patient information and intent gathered, analyzed, and synthesized beforehand and integrated into their workflow, leading to tailored treatments for each patient. Consumers can more easily access convenient, appropriate services by having their symptoms and monitoring data analyzed and triaged beforehand to be directed to the appropriate setting of care.

Retail health incumbents stand to drastically improve the quality and accessibility of care with Generative AI—leveraging a vast consumer base, expansive and accessible footprint, and advanced analytics. These assets can fast-track an automated and interconnected experience, curtailing cost while uplifting care quality. With access to greater data, combined with the capabilities of GenAI to facilitate navigation, the opportunity for retail health is expanding and accelerating. Retail health can become a health hub, while improving accessibility and cost of care overall.

Laboratory service businesses can extend across the value chain, integrating more deeply into care delivery. Generative AI will not only require more data, which laboratory services can feed: this can boost their core business model in a more cost-effective, streamlined approach leveraging "smart labs." GenAI also offers an opportunity for these businesses to expand their business model to direct patient support, second-opinion services, and provisioning of care. These businesses can be at the forefront of clinical decision support, where 70% of medical decisions are already anchored in lab results.[4]

Payers and integrated payvidors (organizations that offer both health insurance and health care services) can completely reshape their operations to lower cost and more efficiently offer services with Generative AI powering innovative new operating platforms and potent care management models. They can offer new products and services that promote and orchestrate entirely new multimodal care models. These organizations can become radically more personalized in design and administration. The basis of competition for health insurers will be reshaped, as consumers and employers demand not only more cost-efficient services but also deeper clinical insights and personalized service.

Among consumers, the rising availability of digital platforms will be pivotal to bring engagement and health literacy to new heights. Today, consumers expect greater fulfillment across multidimensional touch points in their care. With the advent of Generative AI–enabled solutions, consumers will consider it table stakes for their clinicians and insurers to provide personalized experiences informed by their longitudinal health record and preferences. This will accelerate shopping behaviors, as consumers are better equipped to make informed decisions on traditionally complex matters including benefits, treatments, costs, prescriptions, appointments, clinical trials, and wellness.

Elsewhere in the health care ecosystem, life sciences companies can tap into next-generation computational tools that both shave years off R&D timelines and reduce tedious commercial and regulatory barriers to entry. Furthermore, medical technology (MedTech) companies stand to not only accelerate development, but also generate some of the most meaningful, untapped multimodal data to empower longitudinal preventive care.

Generative AI holds promise across industries to streamline operations, from discovery through commercialization—enhancing efficiency, compliance, and consumer-centricity. By harnessing Generative AI, companies can achieve a competitive edge, accelerate innovation, and ensure more agile and informed decision-making across their value chain. In the Deloitte Generative AI Dossier, we provide a road map for health care executives, sharing the most compelling use cases that enhance operational performance, provide hyperpersonalized experiences, and develop enterprise solutions while enhancing quality of care and health outcomes.

As Generative AI advances, it will shift investments to promote and restore health, rather than simply treat sickness, by:

- Enabling radical interoperability
- Leveling the competitive playing field
- Fostering creativity and seeding innovation
- Delivering complex reasoning

This new age of AI makes it even more critical for executives to leverage Generative AI for an enterprise transformation, rather than individual point solutions. Leaders should be asking:

- What are the long-term implications of Generative AI for my business model?
- How should my organization prepare to deploy and scale Generative AI?
- How can I build an enterprise transformation road map that encompasses the full suite of impacts, including regulatory, compliance, privacy, trust, workforce transformation, and tax structures?

SECTION 1

The shifting health care market landscape

As we navigate the complexities of the 21st century, the health care ecosystem finds itself at a critical juncture marked by a series of interlocking crises. The industry has attempted to incrementally solve these issues, and yet we have not made progress toward equitable, quality health care delivery. We are mired in operational, talent, financial, and value crises that demand a new disruptive paradigm. Generative AI is the missing element to truly drive the value, efficiency, effectiveness, and innovation that we require.

Figure 1: The 21st century interlocking healthcare crises

- **Labor shortages:** Accelerated by the COVID pandemic, health care organizations lack workers at every level. Today, hospital CEOs rank "workforce challenges" as the top concern,[5] and these shortfalls are expected to persist with the Association of American Medical Colleges forecasting a 124,000-doctor shortfall in 2034.[6] Even the premier health systems and health plans are unable to stand up operations to manage the growing demand for health care services. The industry has a shortage of 1.1 million nurses, forcing many organizations to use contract labor.[7]

- **Clinician burnout struggles:** The increasing workload, emotional stress, and administrative burdens have caused 81% of clinicians to report high or modest levels of burnout.[8] Clinicians cite administrative requirements, like paperwork and documentation, as unnecessary and low value add. Clinicians are demanding technology and automation to focus on what matters most: caring for patients. Yet many clinicians also do not trust their organizations to properly implement these innovations. Fewer than half (45%) of frontline clinicians trust their organization's leadership to do what's right for its patients. Even fewer, 23%, trust their leadership to do what's right for workers.[9]

- **Profitability declines:** While consumers are concerned about rising and unexpected health care costs,[10] businesses face climbing operational costs and shrinking reimbursement rates, coupled with an inflationary and tumultuous macroeconomic environment. As interest rates remain high, net working capital will remain expensive, and payers and providers will be pressured to substantially increase rates and cut costs, while attempting to maintain service and experience. Health plan underwriting margins fell to a seven-year low of 2% in 2022.[11] Hospital operating margins are at just above 1% and have been negative on average the past year.[12]

- **Value worsens:** National health care expenditures have continued to rise, while the US life span has decreased to its lowest point since 1996.[13] We are paying more and getting less. Health outcomes and life expectancy have significant disparities. The closure of health care facilities and the presence of provider deserts, especially in rural areas and some urban areas, are exacerbating health care accessibility issues, affecting underserved communities the most. Consumers face a 26-day average wait time to see a doctor,[14] and place as many as 20 phone calls to find care.[15]

We need to introduce caring back into health care, and humanity into the experience. Trust is more important today than ever before—trust in clinicians, insurers, therapeutics, and institutions. We define trust holistically: as a series of actions, administrative processes, governance, workflows, and regulations.

Today's health care enterprises each face their own challenges. Payers are battling to streamline selling, general, and administrative costs and the cost of care.[16] Providers are witnessing double-digit growth in staffing costs amid an unprecedented labor shortage.[17] Retail health organizations are battling skyrocketing shrinkage, increasing margin pressures, and evaporating COVID sales.[18] Laboratory organizations are facing stark supply chain and labor cost challenges.[19] Consumers are seeing their out-of-pocket health care costs continue to rise.[20]

Success in health care hinges on creating and deepening trust and innovation across the ecosystem, in providers to make sound care decisions, in payers to cover costs and reimburse appropriately, in pharmaceutical companies to develop efficacious treatments, and in pharmacies to disburse and educate on medications. Yet despite numerous health care advancements over the past 50 years, confidence in the medical system is at all-time lows, down from 80% to 34%. Fifty-five percent of consumers report a negative experience causing them to lose trust in a health system, and patients with lower trust are 19% less likely to engage in preventive care.[21] Within health care organizations, fewer than half (45%) of frontline clinicians trust their organization's leadership to do right by patients, and even fewer (23%) trust their leadership to do right by workers.[22] Deloitte's 2022 TrustID Brand Index Survey—which included 25 life sciences and health care brands—tracked similar trends: trust in both payers and providers has dropped by 15% to 38% in humanity and transparency.

Trust is still the key differentiator to win partners, consumers, and talent. Generative AI has the potential to build trust and address many of the current challenges while unlocking new value creation. Technology, including AI, promises a similar transformative potential as seen in other industries—from the revolution of agriculture through automated irrigation, to the overhaul of retail operations with inventory management systems, and the dramatic improvement of manufacturing productivity via assembly lines.

The promise of Generative AI for health care is the capability to tackle greater complexity, apply more humanlike reasoning, and interact on a more human level than prior AI technologies. We see intrinsic value along dimensions of efficiency, effectiveness, and innovation.

A multifaceted approach to address these health care challenges requires a combination of improved efficiency, increased effectiveness, and innovation—all of which are ways in which Generative AI can unlock new value for health care leaders across efficiency, effectiveness, and innovation. According to the Deloitte Health Care Generative AI Outlook Survey of 60 health care C-suite executives in September 2023, 90% of leaders believe Generative AI technologies can best help their organization by improving efficiencies.

SECTION 2

Navigating the obstacles and opportunities for Generative AI in health care

Generative AI, while immensely powerful, forms just one part of a larger, more diverse toolbox of AI solutions available to business leaders. The foremost step in deploying AI in an organization is a clear identification and understanding of the problem to be solved. Based on the need, the appropriate AI solution can be chosen from the broader suite of tools that extend beyond Generative AI. It's critical to understand that Generative AI isn't a cure-all; it offers distinct capabilities but may not be the right fit for every scenario.

A comprehensive AI strategy, or even an AI solution, often involves bundling various technologies such as rule-based systems for processing defined business logic, robotic process automation for automating repetitive tasks, discriminative AI for making precise predictions based on a set of given inputs, and finally, the indispensable human intervention for complex decision-making and reasoning.

Business leaders must ask the question: What is Generative AI best suited for, compared to other solutions in place today?

1. Generative AI technologies should be viewed as accelerants and supplements, not replacements, to humans. As this technology matures, we expect the sophistication and independence of the solutions to require less human intervention.

2. Generative AI is a powerful new technology to be embedded within a suite of other AI solutions. Indeed, Generative AI is not a panacea for all solutions. It outperforms other AI models on key dimensions but still lacks capabilities in extraction and computation.

Generative AI should be seen as a piece of the larger puzzle in the strategic application of technologies, each complementing the other to form a robust and comprehensive solution for diverse business challenges.

The gap of AI adoption in health care

In Deloitte's State of AI in the Enterprise 2022 report, we note that there is a stronger urgency, especially among biopharmaceutical executives, to tackle the risks associated with AI technology in order to innovate and gain an edge over the competition.[23] Yet, the adoption of AI and all technologies in health care has consistently trailed behind other sectors, often falling behind due to cost, structural, regulatory, organizational, and technical challenges.

Health care has lagged in its AI adoption. A study conducted by Brookings in 2022 found that health care's AI integration rate lagged all other industries outside of construction.[24] Technical and interpretability challenges, a heavy dependence on text and contextual data, and inherent biases in AI models have hindered widespread AI acceptance in health care. Prior NLP techniques demonstrated significant shortcomings, with false-negative rates and limited efficacy detecting contextual types of languages.[26] These issues, combined with the high-stakes nature of health care, underscore the complexity and sensitivity of implementing AI.

Yet, there is tremendous opportunity to leverage an ample supply of health care and real-world data. Health care has become the world's largest data source, at 30% of annual production,[27] with 80% of that health care data being unstructured.[28] The path to widespread AI adoption in health care is uphill, but the richness of health care data and ongoing advancements suggest an optimistic outlook for this next age of Generative AI. We anticipate that Generative AI will likely make near-term impacts across efficiency, effectiveness, and innovation. In our point of view, "A new frontier in artificial intelligence: Implications of Generative AI for businesses," we proposed a five-part functional framework for Generative AI use cases and value levers. Generative AI models differ from prior AI and ML models in ways that deliver value across activities that **accelerate, automate, create, personalize,** and **simulate.**

Figure 2: The evolution of AI technologies

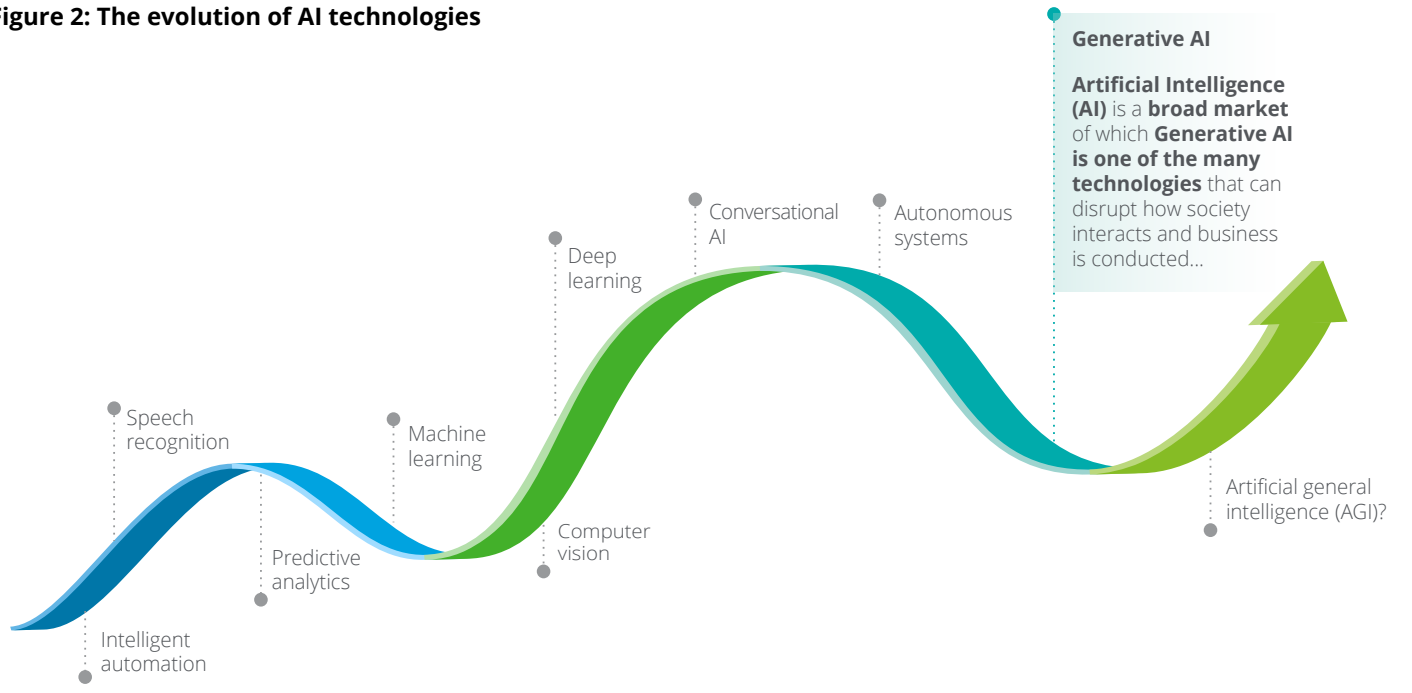


Figure 3: The differentiated functions of GenAI in health care

Accelerate	Automate	Create	Personalize	Simulate
Enhance productivity by accelerating outcomes and offering top-tier building blocks	**Deliver business and technical workflows, and in some cases, replace humans**	**Push boundaries of creativity, leveraging prompts to develop novel content**	**Create familiarity and personalization, which could take significant effort**	**Create environments in which workflows, experiments, and experiences can be simulated**
Document distillation Synthesizing lengthy text into short-form summaries, evidence tables, or dashboard/knowledge graphs	**Code classification** Processing unstructured inputs to produce a list of discrete alphanumeric codes that are used in downstream processes	**Record summarization** Summarizing care encounters (for HCPs) with details about history, symptoms, procedures, diagnoses, etc.	**Prompt generation** Enabling information gathering across stakeholders in a patient-friendly way, through a back-and-forth conversation	**Interaction visualization** Building digital 3D models of cellular and chemical structures to aid in discovery, development, and diagnosis
Component compilation Integrating information from different source systems into a cohesive, ready-for-review artifact with next steps and image		**Multimedia creation** Generating interactive materials that contain text, interspersed with video and images, for education or engagement	**Jargon simplification** Explaining complex concepts at an appropriate health literacy level through shorter-form, simplified versions	**Hypothesis validation** Running experiments and workflows via a machine to help refine parameters before rolling out a process out in practice
			Translation to preference Translating patient-facing clinical and non-clinical documents in real time, in a patient's preferred language	

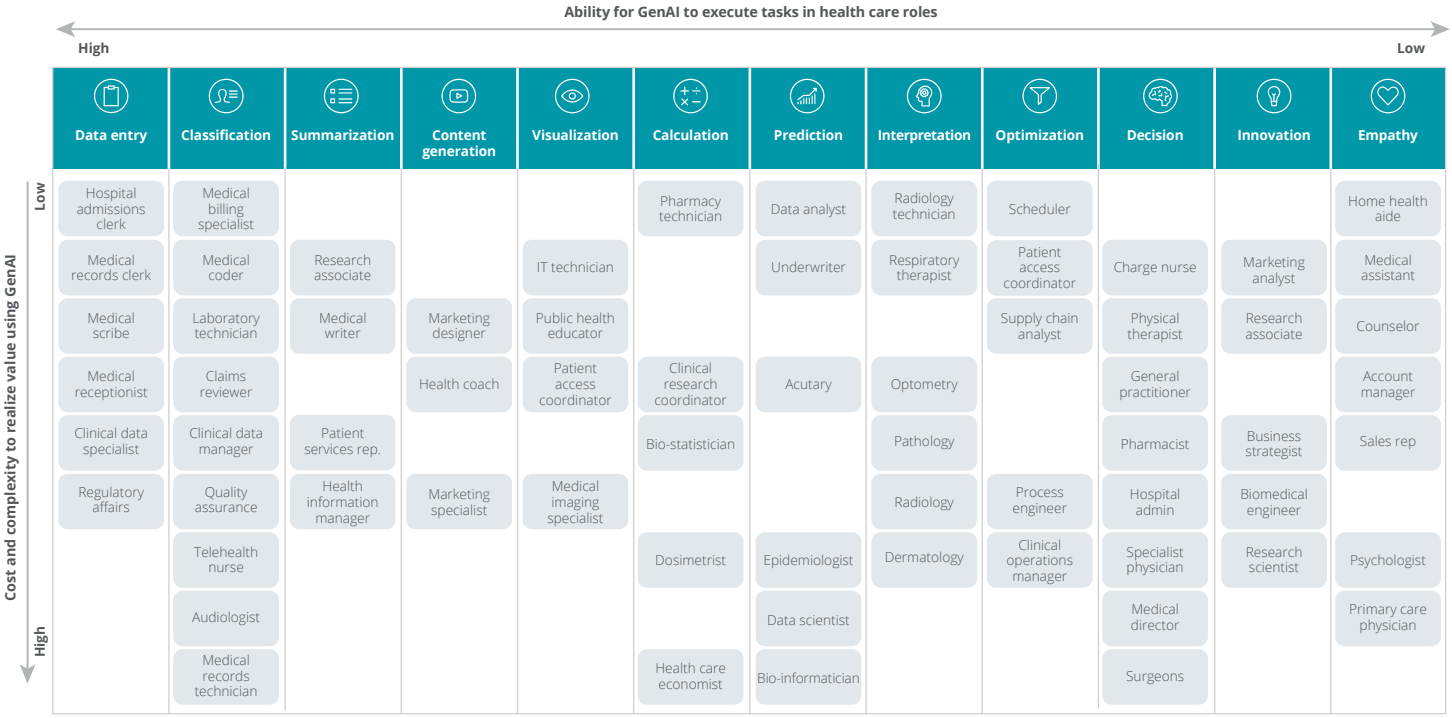
The promise of recent and upcoming Generative AI advancements

2023 has witnessed an unprecedented level of advancement of Generative AI technologies. By April, ChatGPT was shown in a JAMA study to outperform physician responses to medical questions on dimensions of both quality and empathy.[29] Google's health care–specialized MedPaLM-2 large language model (LLM) became the first to achieve an expert-level passing score on the US Medical Licensing Exam,[30] and the first drug completely designed with Generative AI techniques was entered into human clinical trials.[31] New groundbreaking GH200 graphics processing units (GPUs) have been announced with promise to precipitously drop costs for LLMs in both training and inference in 2024.[32] The Deloitte Health Care Generative AI Outlook Survey found that 72% of health plans and 80% of health systems have already launched pilots or are actively scaling across the enterprise highlighting potential rapid adoption. This pace of change and uptake plots a tremendous trajectory.

The complex health care industry, we project, will likely focus on specialized Gen AI models and heavily prompted and fine-tuned use cases. Indeed, the investments into Generative AI this year alone have demonstrated outcomes previously thought to be 20 to 30 years away. Competition among major technology players is raising the bar—fueling new releases on the scale of months, rather than years. Some notable technology organizations have made their models open source to the public. These open-source LLMs offer benefits in customizability for specific tasks, fine-tuning on proprietary data, control over privacy and costs, and enhanced accessibility, positioning them as a flexible and cost-effective choice for organizations desiring domain-specific performance. These strategic choices exert pressure on large hyperscaler market leaders, who are now facing increasing customer demands to provide greater transparency and flexibility in their proprietary models.

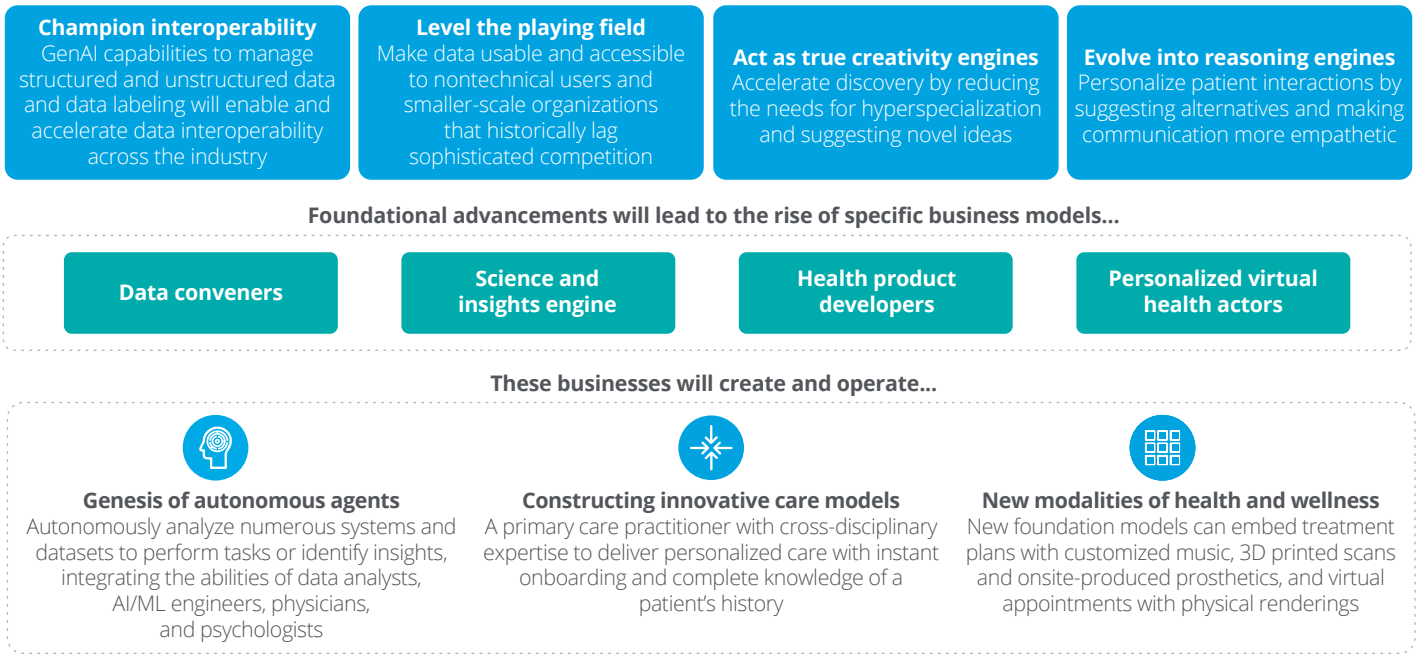
Generative AI aligns well to functional needs within health care underserved by traditional AI and ML models. In certain functions, Generative AI is positioned to potentially replace tasks and roles in data entry, classification, and generation, while supplementing tasks requiring more empathy, innovation, and decision-making. Today, Generative AI solutions are better fits for top-left functions that are lower cost and lower complexity, but as the models advance and stitch together with a broader suite of AI solutions, we foresee potential for broad use.

Figure 4: The impact of GenAI based on task and value



Generative AI has far exceeded previous state-of-the-art solutions. These early successes are just the beginning as Generative AI leaves the laboratory and integrates into products across the health care ecosystem. It is no stretch to imagine the potential transformative applications of this technology.

Figure 5: The Future of Health™ and GenAI



SECTION 3

Unlocking the value of Generative AI

The power of this moment, at large, is tremendous, yet the obvious question remains: Where should I, as a health care business leader, make immediate investments to win in the new age of AI?

In practice, the key question becomes how to effectively deploy these Generative AI models, both in terms of which issues they are fit to solve and which areas of the enterprise will likely be positioned to maximize their value. In the *Deloitte Health Forward Blog*, we argue for the value of incrementalism, where health care leaders strike a balance between short-term demands and a long-term vision. Business leaders must keep an eye toward the innovation arc, while placing immediate bets on areas within the enterprise.

Generative AI pre-trained models have historically used publicly available, non-industry-specific datasets. Some of these pre-trained models have potential applicability to administrative, operational, and back-office use cases. However, within the health care environment, especially in the context of clinical delivery, stakes are high, and language must be precise, in addition to articulate. The rise of health care–specific Generative AI LLMs in addition to a more deliberate and experienced execution approach is breaking ground to pursue these more sensitive and nuanced use cases that evolve patient care.

In our Deloitte Generative AI Dossier, we elaborate upon high-value use cases that health care leaders can pursue to create value across (1) employee productivity and operational efficiency, (2) hyperpersonalized experiences, and (3) new enterprise digital and data capabilities. Below, we provide each example aligned to a respective value driver.

	Co-writer for denial appeal letter	**Supply chain optimization**	**Personalized service for patients**
	Driving administrative cost-efficiency through employee productivity and operational efficiency	**Supporting optimization by leveraging GenAI to simulate, model, and generate data-driven insights**	**Assisting human staff responding to patient questions**
Opportunity	• There are many claims that are denied in the US representing billions in added costs • Sixty percent of denied claims can be reclaimed, but only 0.2% are appealed	• Supply chains involved many stakeholders and dependencies creating complexity • High complexity makes efficiency, resilience and cost management difficult	• Patients often have to spend hours with IVRs and other systems to resolve issues • High call volumes require numerous agents to handle
Role of GenAI	• Scan vast amounts of policies to retrieve context for claims appeals. • Extract patient data from EHR • Craft an appeal letter	• Predict potential disruptions • Facilitate scenario analysis in digital twin environments • Assist in comprehensive supplier evaluations	• Fine tune response based on each customers' needs and preferences • Support live agent by summarizing questions and even replacing them • Give agents real time personal feedback
Value created	• Recover billions of dollars in un-appealed claims • Alleviate current burdensome process to appeal claims reducing administrative cost for providers	• Quickly adapt to shifting market dynamics • Differentiate between disruptions and noise • Make optimized decisions to reduce costs and improve operational efficiency	• Boost customer satisfaction by decreasing resolution time and increasing deflections • Improved agent productivity lowers costs • Identify and extract common issues to guide strategic decision making for payers and providers

Each primary health care ecosystem stakeholder has a unique organizational context and opportunity to deploy Generative AI solutions. Administrative and operational applications present immediate opportunities to support employees in tasks and to shorten cycle times that affect consumers and partners in areas including claims management, prior authorization, lab procedures, compliance, procurement, and contracting. These areas all represent near-term portions of the organization that can begin training models and applying them within the organization.

As business leaders work to envision both the art of the possible and the practicalities of where Generative AI can make a difference tomorrow, we foresee enormous value-creating potential in lower risk functional areas.The long-term value will come from fully integrated solutions spanning functions, where business and clinical leaders must weigh an important set of trade-offs and risks.

Generative AI in health care promises groundbreaking innovations, merging diverse capabilities to create holistic wellness agents, pioneering care models with advanced telemedicine, and introducing next-generation diagnostic tools for adaptive, comprehensive patient care.

Figure 6: Key areas of opportunity to deploy GenAI by stakeholder

Providers/retail

Community hospitals, regional/national health systems, academic medical centers, payvidors, and retail health clinics that manage workflows:

Administrative and operational
Involving inputs to revenue cycle, reporting, and approval processes

Care navigation
Enabling tasks from registration and triage, to referrals and transitions

Care delivery
Facilitating direct patient care through clinical decision-making and monitoring

Payer

Private and public health insurers administering individual, employer, and Medicare/Medicaid plans that manage workflows:

Administrative and operational
Executing on tasks related to costs, coverage, contracts, and reimbursement

Clinical and HCP coordination
Driving care delivery strategy and decisions through population health management

Member engagement and marketing
Engaging with potential members, from building awareness of options to driving actions on care plans

Laboratory

Leading diagnostic companies providing comprehensive clinical laboratory and end-to-end diagnostics services:

Research
Discovering new diagnostic techniques and medical advancements, and accelerating insights

Laboratory operations
Managing and coordinating samples and test processing across sites and partners

Supply and manufacturing
Producing reagents and equipment, and optimizing supply chain efficiency

Sales and marketing
Simplifying patient access and support, enabling sales scalability and efficiency

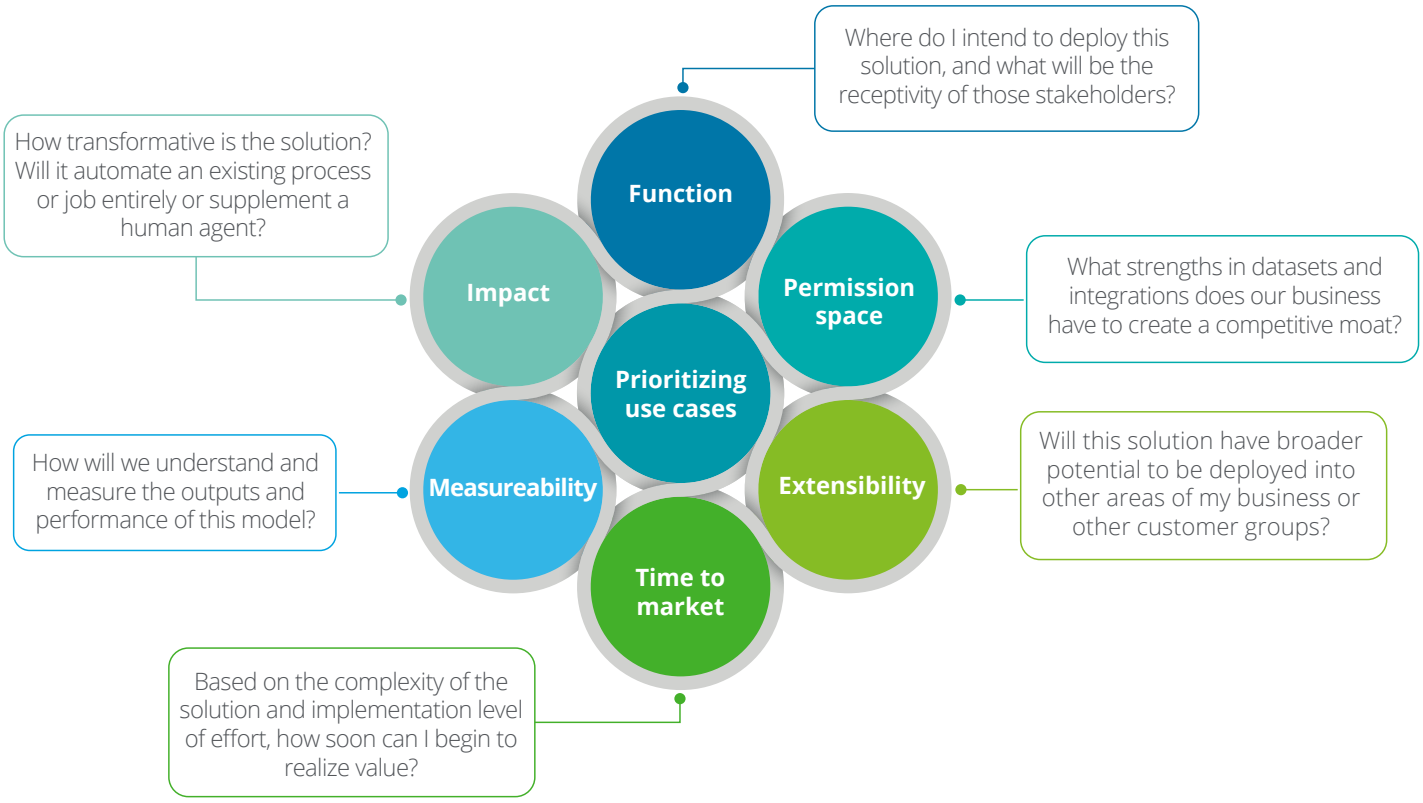
Enabling areas
Streamlining financial reporting, employee onboarding, partner management, and compliance

A prioritization framework for Generative AI

As advancements in Generative AI continue to accelerate, health care business leaders are faced with a wealth of potential applications for this groundbreaking technology.

Balancing these dimensions can guide leaders to make informed decisions about Generative AI implementations that benefit their organizations, patients, and the broader health care ecosystem.

Figure 7: A GenAI organizational prioritization framework



Decisions on how and where to integrate Generative AI into operations should be strategically aligned with a clear understanding of the potential risks. In selecting a use case to deploy, leaders must evaluate each idea on its merits across six key areas: impact, function, measurability, permission space, time to market, and extensibility.

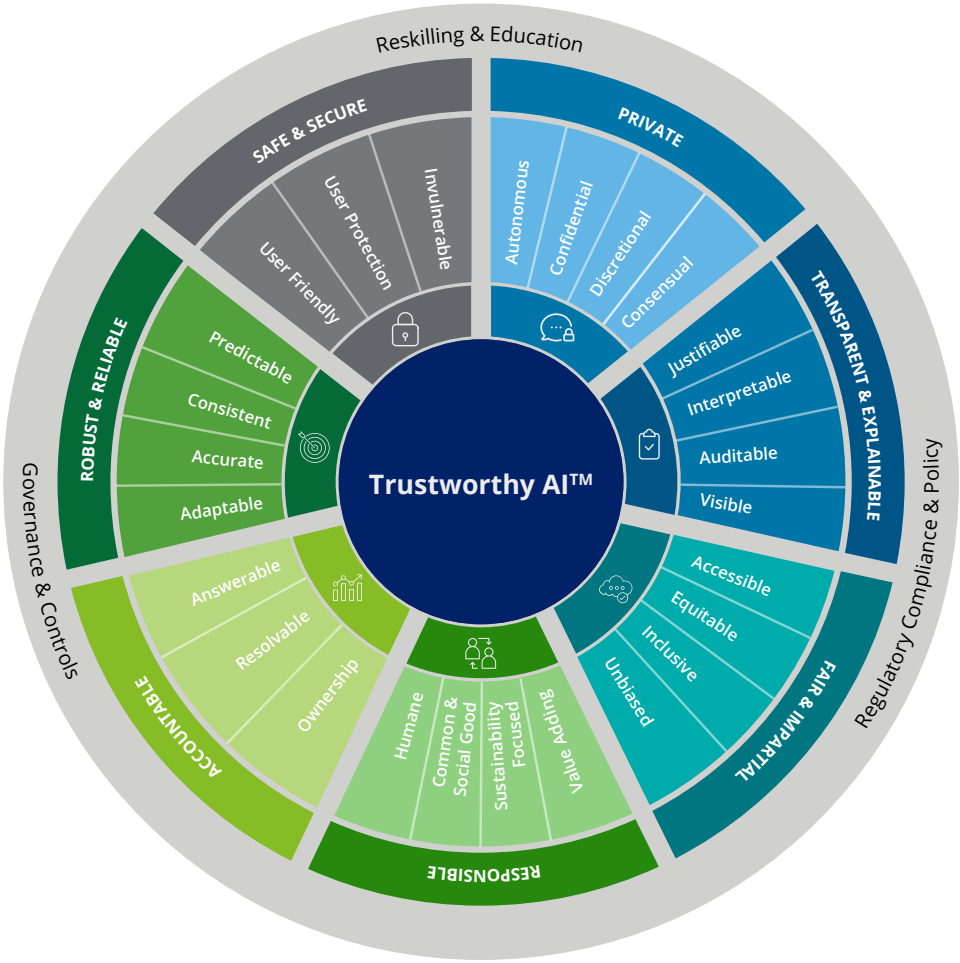
SECTION 4

Activating Generative AI for your organization

Comprehensive AI risk management principles are fundamental to the implementation of responsible and effective AI practices. Deloitte's Trustworthy AI™ framework highlights the importance of fostering an AI environment that emphasizes safety, robustness, reliability, responsibility, privacy, transparency, and fairness. Specifically, this framework champions the development of AI systems that are safeguarded from potential threats, both physical and digital; that learn consistently from human and system interactions, ensuring reliability; that operate with social responsibility; that prioritize consumer privacy and data integrity; that maintain transparency and explainability in decision-making processes; and that apply checks to guarantee fairness and impartiality.

The importance of leading by building trust cannot be understated. Without trust, consumers, clinicians, and organizations will never maximize Generative AI solutions.

Figure 8: The Trustworthy AI™ framework

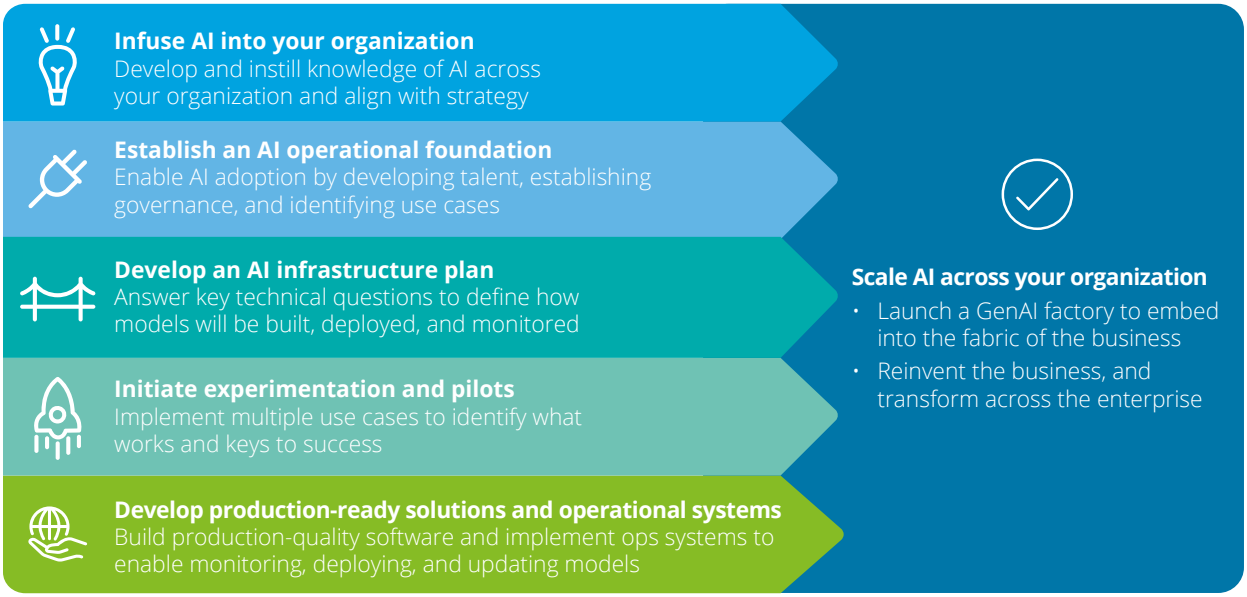


An enterprise 'road map' to activating Generative AI transformation

Organizations can begin a Generative AI activation strategy from multiple starting points. The key is to rethink how to frame the business problem and desired outcome, taking a problem-first, technology-second approach, rather than a technology-first, problem-second approach. We propose a five-part approach to actualizing Generative AI with a set of Trustworthy AI™ considerations within your business, where organizations can begin in any of the five areas and pursue parallel progress.

Furthermore, given recent regulatory announcements by Europe/Middle East/Africa (EMEA) and the Biden administration executive order, we expect more robust regulatory frameworks to be announced. This underscores the importance of a Trustworthy AI approach from early stages to proactively deploy generative AI plans that will thrive in the emerging regulatory landscape. To deploy Generative AI solutions at scale, organizations must do much more than generate uses cases, they must prioritize a plan, identify areas to invest in near and long term, construct a road map for change, and establish governance inclusive of risk, compliance, regulatory, workforce transformation, finance, and trust.

Figure 9: The five-part approach to deploying AI solutions at scale



Part 1: Infuse AI into your organization

- **Develop an understanding of AI and align with business strategy.** Craft ethical AI guidelines, ensure applications match their purpose, consider human oversight needs, and weave AI initiatives seamlessly into the broader business strategy to capitalize on areas for a competitive edge.
- **Promote AI literacy and collaborate with experts.** Kick-start a comprehensive learning program on generative AI with workshops, courses, and seminars, while forging ties with AI experts from consultancies, academia, and tech sectors to remain abreast of the latest trends.
- **Analyze implications and organizational hurdles.** Dive deep into the implications of generative AI on business operations, pinpointing both potential hurdles and lucrative opportunities, and champion AI literacy organization-wide through strategic communication and training endeavors.

Part 2: Establish an AI operational foundation

- **Assess talent implications. Evaluate where the adoption of** GenAI may lead to job displacement, particularly in areas involving routine administrative tasks, and where GenAI will introduce new opportunities for roles to include meaningful work and net new jobs in areas like prompt engineering. GenAI will usher in new operating models that break down siloed operations and promote cross-functional collaboration.
- **Build AI into learning and onboarding.** Integrate Generative AI into current learning and onboarding processes, including building awareness of the organization's AI ambitions, increasing comfort and familiarity with AI applications, and creating customized learning materials with specific role-based skills. GenAI opens opportunities for all employees to acquire new skills and transition into more complex, patient-centric roles. In addition to being added to the curriculum, this technology can improve learning by customizing learning materials and simulated scenarios.
- **Adopt agile governance and a portfolio approach.** Given the pace of advancement in AI, strategic planning cannot be performed in annual cycles. Adopt agile IT frameworks across functions and take a portfolio approach to strategic bets. This allows for enterprise governance and innovation that can lead to significant breakthroughs while accounting for risk, regulation, and trust.

Part 3: Develop an AI infrastructure plan

- **Assess and enhance data infrastructure.** Evaluate your existing data infrastructure's capability to support AI objectives. This involves examining various areas such as data engineering, machine learning operations, data quality, data privacy, integrations, governance, scalability, and the sufficiency of hardware and software resources. Based on the assessment, make necessary investments to upgrade and optimize the infrastructure.
- **Choose appropriate foundation models.** Select the right foundational models that are in line with your business objectives. These should cater to specialized needs for various health care functions as well as address security requirements. Consider factors such as:
  - Desired modalities: text, image, audio, video, 3D, code, or multimodal
  - Data sources: public, licensed, synthetic, customer-owned, or federated
  - Foundation model options: in-house models, licensing models, or open-source models
  - Specialized training requirements: pre-training, fine-tuning, parameter-efficient tuning, prompt design, prompt tuning, model optimization, embeddings, plugins, reinforcement learning, transfer learning, and tokenization
- **Decide on build or buy approach.** Decide whether to develop proprietary AI models or leverage pre-trained ones. This involves evaluating factors such as resource availability, data, internal expertise, level of required customization, and cost-effectiveness. Based on the chosen foundation model, identify potential partners for various aspects, such as data sourcing, model support, development, and commercialization. Establishing strategic partnerships can enhance your AI capabilities.
- **Mitigate risks of malicious behavior and protect privacy.** Actively minimize the risk from malicious behavior that could potentially disrupt operations and compromise customer trust. This may involve implementing safeguards to prevent unintentional exposure of confidential information by AI models or to protect against other cybersecurity threats. Further, adhere to data privacy regulations when using Generative AI models. Implement stringent guidelines for data-sharing, especially for confidential or personally identifiable information.

Part 4: Initiate experimentation and pilots

- **Identify relevant use cases.** In collaboration with your expert partners and customers, identify potential areas in your business where Generative AI could add substantial value. These could be within your existing products and services or new areas of potential growth. In our Deloitte Generative AI Dossier, we enumerate a set of high-value health care use cases for leaders to consider.
- **Assemble the right team.** Construct a multidisciplinary team that comprises AI specialists, data scientists, data analysts, and engineers, as well as business strategists and other stakeholders. This team will likely be crucial to drive AI projects and ensure they align with business objectives. Upon deployment of solutions, new skill sets will be critical in ongoing model tuning and maintenance.
- **Establish strategic partnerships.** Engage with system integrators and technology partners who can provide additional expertise, resources, and insights. This collaboration can expedite the deployment of AI technologies in your organization and improve outcomes.
- **Implement pilot projects.** Embark on small-scale pilot projects to assess the potential and effectiveness of Generative AI in your business. These pilots can serve as the foundation for scaling up AI applications, providing valuable insights into operational requirements, and identifying potential challenges that may arise during larger-scale implementation.

Part 5: Develop production-ready solutions and operational systems

- **Develop robust and ethical models.** Choose the appropriate model architecture and parameters, training or fine-tuning the models based on specific business needs. Test and evaluate models in diverse scenarios to ensure they are accurate, cost-effective, and unbiased. Select or design an LLM gateway framework to create a standard interface or application programming interface to access LLMs enabling applications to take advantage of the latest and most efficient models from various vendors with minimal rework.
- **Embed AI models into business workflows, applications, or platforms.** Evaluate and construct an end-to-end view of your organization's technology and business processes. Identify user stories to enhance and improve workflows and integration points for human oversight
- **Establish large language model operations (LLMOps) systems and processes**. Use specialized tools and techniques to manage the deployment, monitoring, and scaling of LLMs in production environments. Enable easy rollback, retraining, auditing, and redeployment capabilities. Implement logging and monitoring to track model behavior, performance, and usage in real time.
- **Conduct risk assessments.** Survey all AI models within your organization, evaluating the innate risk of each for bias, operational mishaps, hallucinations, confidentiality, and ethics. Institute protocols and procedures to routinely check for algorithmic bias and AI-related risks, specifying the assessment frequency for different model categories. Set benchmark metrics to track variations in each model's effectiveness, impartiality, and transparency.

Upon making progress in each of the five areas, an organization is prepared to truly scale, manage, and govern AI across the business. To truly realize enterprise transformation value, it is critical to focus on outcomes-based business transformations to thereafter realize at-scale cost-reduction, process efficiencies, and discovery.

Striking the right balance for success

The Future of Health™, shaped by the advent of Generative AI, presents an era of promising advancements and possibilities. To fully capitalize on Generative AI, leaders must prioritize a thorough understanding and strategic approach toward AI integration.

Successful integration of Generative AI into health care hinges on effectively balancing the potential for impactful improvements against the inherent risks. As an industry, health care requires bold leadership to drive the industry forward with outcomes for consumers and efficient management of resources, both human and capital. Leaders should conduct a rigorous, case-by-case assessment of each potential Generative AI application, carefully weighing the potential benefits against the associated hazards.

Given the rapidly accelerating pace of this technology—coupled with its complexity—Generative AI is challenging for organizations to implement effectively. That's where the role of a trusted third party becomes invaluable. By working with experts who have an in-depth understanding of the technology, health care executives can navigate the complexities, maximize their return on investment, and ensure the technology is tailored to meet their unique needs. Leveraging external expertise as your organization begins its GenAI journey can prove to be the crucial catalyst in the quest to transform health care. Looking ahead, we plan to discuss implementation, ongoing maintenance, and interoperability in future publications.

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