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Life Sciences Practice

Reimagining life science enterprises with agentic AI

Agentic AI is poised to boost the benefits from AI by changing its role from tool to coworker and catalyzing an end-to-end reimagining of the life sciences value chain.

This article is a collaborative effort by Dan Tinkoff, Delphine Zurkiya, Eoin Leydon, and Jeffrey Lewis, with Chaitanya Adabala Viswa, Lionel Jin, and Meredith Langstaff, representing views from McKinsey's Life Sciences Practice and QuantumBlack, AI by McKinsey.

September 2025

Life sciences companies are facing margin pressures, higher R&D costs, and the need for continuous innovation amid increasing technological and operational complexity. They're also struggling to attract and retain talent. Externally, they are subject to heavy regulatory oversight and legislative uncertainty. For pharmaceutical companies, many blockbuster drugs are nearing patent expiration. For medtech companies, many devices in development, such as robotics and connected devices, are becoming complex platforms. For life science services companies, AI and the shift to cell and gene therapies are driving rapid technological changes. Factors such as global economic shifts, trade tariffs, most-favored-nation pricing policies, supply chain vulnerabilities, and geopolitical tensions further complicate the landscape. Meanwhile, the rapid progress of AI creates both opportunities and challenges. These combined pressures make it essential for life sciences companies to find new ways to boost growth, improve productivity, and increase operational agility.

Recent McKinsey research has found that nearly eight in ten companies use gen AI, yet 80 percent of them report no tangible bottom-line benefits.[1] Function-specific AI use cases have the greatest potential benefits, but companies face hurdles in expanding them past the pilot stage.[2] Think of it as the AI paradox—the technology has potential, but enterprises haven't yet adopted it nor seen its benefits at scale.

AI agents (for a definition, see sidebar "What is agentic AI?") have the potential to resolve this paradox by changing AI's role from tool to coworker. They can be combined into configurable networks that help employees by collaborating with them, performing tasks on their behalf, and handling activities that are currently low priority because of limited capacity, such as those related to the large volumes of lower-priority customers, contracts, and invoices. In our experience, there are benefits to viewing AI as a coworker: People tend to be more patient with AI and invest their time to improve it through feedback; they become creative in finding more parts of their workflow that can be "agentified" once they see what is possible; and they proactively seek better ways to reorganize workflows once they understand how AI can help.

To understand how agents might change work and responsibilities in life sciences, we conducted a thorough, end-to-end, task-based analysis to evaluate the potential benefits of AI agents in specific workflows (see sidebar "How we determined the potential benefits of agentic AI in life sciences"). We analyzed 270 workflows and 1,200 tasks in 180 job families and found that agentic AI will transform workflows, change how work is done, and increase value by spurring growth and reducing costs in both pharma and medtech (Exhibit 1, parts 1 and 2). In pharma, 75 to 85 percent of workflows contain tasks that could be enhanced or automated by agents, potentially freeing up 25 to 40 percent of an organization's capacity. In medtech, the figure is 70 to 80 percent. These capacities are at the task level, so they may be fractions of employees' time. Organizations will need to make choices about how to redeploy this capacity, with implications for the shape of the organization and how work is conducted. Patients stand to benefit in various ways, including through quicker access to a wider range of new medicines, more personalized treatments developed using patient data, and improved matching of existing treatments to unmet needs.

We estimate that the full potential of agents could give companies incremental growth of five to 13 percentage points in pharma and three to seven percentage points in medtech. EBITDA would increase by 3.4 to 5.4 percentage points in pharma and 2.2 to 4.7 percentage points in medtech over the next three to five years, in addition to current initiatives focused on growth and margin expansion.

We found that the opportunities for agentic AI in the pharmaceutical and medtech sectors are similar in most domains, except in R&D, where their approaches differ significantly. This article presents the results for both sectors and highlights notable differences where relevant.

[1] "Seizing the agentic AI advantage," QuantumBlack, AI by McKinsey, June 13, 2025.
[2] "Seizing the agentic AI advantage," QuantumBlack, AI by McKinsey, June 13, 2025.

What is agentic AI?

AI agents are goal-driven systems that operate independently by breaking down complex tasks, interacting with other systems, and learning in real time. They use machine learning and rules-based AI to enable reasoning, memory, and the capacity to interact with humans.

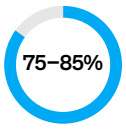
Gen AI includes lower-complexity agents, sometimes referred to as "low-code" or "no-code," that employees with minimal coding experience can create and modify using natural language on various platforms. It also includes higher-complexity agents, sometimes referred to as "pro-code," which must be developed and fine-tuned by data scientists or engineers.

Lower-complexity agents are well-suited for predictable tasks that can be chunked into subtasks, as well as for work with clean data, integrated systems, limited specialized knowledge, and lower-risk tasks. Typical uses include automated report generation and analyzing customer feedback. Higher-complexity agents are needed when those conditions aren't met, such as in predictive modeling for clinical trials or firmware development for medical devices. However, even no- and low-code agents require people to create, test, and tweak them and think through adoption and performance tracking. All AI agents should be part of broader business and talent changes that include training and incentives to promote adoption. As managers transition to overseeing a flexible network of agents that perform, adapt, and learn, the operations of life sciences organizations could transform fundamentally. Because the life sciences industry is strictly regulated, agents must consult humans before making important decisions or performing major tasks. Guardrails are set by the enterprise, a function or business unit, or the manager or supervisor overseeing that AI.

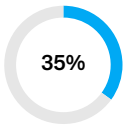
Exhibit 1, part 1

There are several potential benefits of AI agents in pharma.

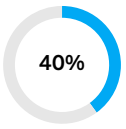
Work will transform



Agentifiable workflows
Processes in life sciences where key activities can be augmented or automated by agents

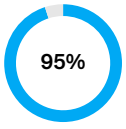


Lower-complexity agents
Agents that require minimal coding, with mostly business-driven build and oversight and rewiring mechanism for adoption

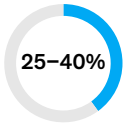


'Superpowered' work
Workflows can be extended by agents doing work that is currently too complex or costly for humans

Roles will change



Roles with AI sidekicks
With agents as integrated teammates, employees' impact for patients can be amplified

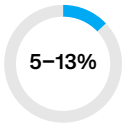


Freed-up enterprise capacity
Assigning agents to tasks where they excel (and humans don't) can free up time for where humans' unique abilities are needed most

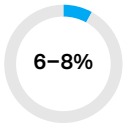
10+

New role types needed
Agentic workforce can succeed with help from humans in new roles such as agent orchestrator and AI governance or quality manager

Revenue will be affected



Growth impact
Expanded and better assets, more eligible patients reached, and revenue pulled forward within 3-to-5 year time frame, with potential for incremental 1% to 3% CAGR above baseline growth



Cost efficiency
Potential savings from increased productivity, reduced vendor spend, and optimized operations

3.4–5.4 p.p.[1]

Impact to EBITDA
Full potential enterprise-wide impact on EBITDA within a time horizon of 3 to 5 years

Note: Numbers do not include physical AI or growth from AI in products.
[1]Percentage points

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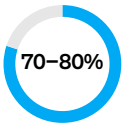
Exhibit 1, part 2

There are several potential benefits of AI agents in medtech.

Work will transform



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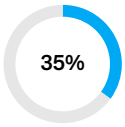

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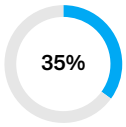

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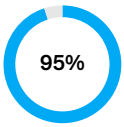

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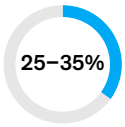

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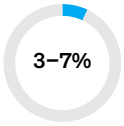

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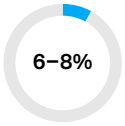

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Full potential enterprise-wide impact on EBITDA within a time horizon of 3 to 5 years

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How we determined the potential benefits of agentic AI in life sciences

1. **We analyzed** each domain in biopharmaceutical and medical technology firms and deconstructed their workflows to generate a comprehensive map of all 270 workflows.
2. For each workflow, we examined more than 1,200 key tasks to assess whether they could be agentified, with simpler or more complex agents; the share of the task that agents could handle; and the time they could save.
3. We examined the roles responsible for those tasks and the amount of time each role spends on them. We analyzed 180 job families and identified ten new roles, such as agent orchestrator and AI quality manager, that will be needed to support agents.
4. This provided us with a bottom-up view of growth and productivity opportunities, which we analyzed at the profit and loss (P&L) level for each domain. A panel of technology and domain experts reviewed the benefits of each revenue and expense item and considered the costs to deploy and manage those agents.
5. We compiled those numbers by domain and functional area to assess the overall benefits to the P&L and the reduction in time-to-market for new medicines.

Agentic AI is catalyzing three key shifts in life sciences

1. *Agentic AI can transform eight out of ten workflows*. Of the more than 270 life sciences workflows we analyzed, 75 to 85 percent of workflows in pharma and medtech have tasks that could be automated or augmented by agents (Exhibit 2). Nearly 40 percent of workflows are relatively standard and predictable and could be addressed by lower-complexity agents that business users could customize and implement themselves, possibly with minimal technical support. Another 50 percent are more complex, domain-specific workflows that companies could support with custom-built agents to help them differentiate from competitors.

2. *Up to 95 percent of life science roles may have agentic teammates*. Every functional area, domain, and job family has tasks for which agents could be deployed. Two-thirds of those roles will be involved in some combination of directly building, managing, and supervising lower-complexity agents, which they will orchestrate, tune, monitor, and maintain. New team roles, such as agent orchestrators, AI governance and agent quality managers, and agent supervisors, could also be needed to implement and support agentic workers.

   We expect this shift to free up 25 to 40 percent of enterprise capacity, allowing employees to focus on more strategic, value-adding, and productive work (Exhibit 3). At first, this additional capacity will free up employees for part of their work week, but we anticipate that over time, job descriptions, job families, and even organizational charts will evolve to replace certain roles entirely. This creates an opportunity for the leadership team—and especially human-resource officers—to rethink the shape of the organization. Management will have to decide what to do with freed-up capacity; this will likely depend on the domain. Some companies will reinvest it, some will grow into it—for example by freezing hiring—and some might take the margin improvement.

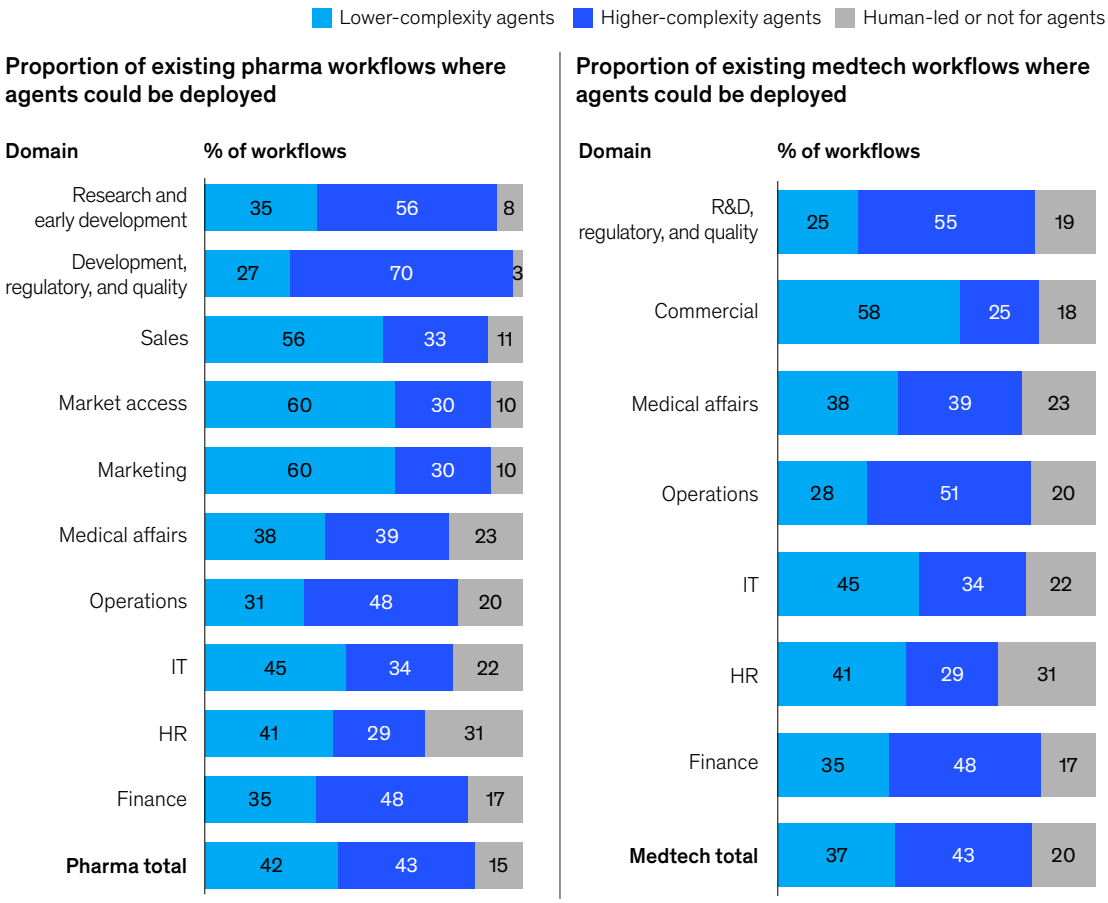
   The greatest productivity boost may come from agents performing tasks that humans are not currently doing; we found that 40 percent of workflows include tasks that are too complex or uneconomical for humans to perform, but that agents could handle at scale. Agents could find patterns that humans cannot, especially in complex, unstructured datasets. This could help researchers gather insights from diverse sets of scientific data and identify value leakage in the long tail of invoices, which are typically not a priority for human review. Agents could also collect and analyze data from a wide range of sources to continually monitor and report on a company's brand health, enabling always-on brand performance. These agent-specific strengths can create possibilities for new workflows, processes, and ways of working.[3]

3. *AI agents could boost growth and EBITDA*. They could lift growth by 5.0 to 13.0 percentage points in pharma and 3.0 to 7.0 percentage points in medtech, while increasing the EBITDA of pharmaceutical companies by 3.4 to 5.4 percentage points and medtech companies by 2.2 to 4.7 percentage points over the next three to five years (Exhibit 4, parts 1 and 2). Half of this increase would come from a boost in net revenue from acquiring more and better assets, reaching more eligible patients, and accelerating the time to market. The other half would come from greater efficiency in R&D and manufacturing and administration. As life sciences companies face margin pressures from portfolio crowding, policy changes, and pricing dynamics,[4] this potential margin boost is especially important. Capturing the full potential of agentic AI requires an enterprise-wide effort to which every domain contributes. This may be challenging for some companies, but even a subset of domains transformed by agents would yield significant benefits.

[3] "The future of work is agentic," McKinsey, June 3, 2025.
[4] "Simplification for success: Rewiring the biopharma operating model," McKinsey, March 21, 2025.

Exhibit 2

Agents can augment 75 to 85 percent of today's workflows.



Note: Figures may not sum to 100%, because of rounding.

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Exhibit 3

Agents could free up 25 to 40 percent of employees' workloads.

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Reimagining work with agents

Agents can help tackle complex problems in life sciences, freeing people to develop more treatments and address other challenging problems. Here are six life sciences battlegrounds where agent-based AI can generate substantial benefits:

1. Pharma research: Accelerating discovery and deepening scientific insight

Research and early drug discovery involve complex processes, but agents can still enhance almost every workflow (Exhibit 5). The specialized data and expertise needed mean that nearly 60 percent of workflows will require custom-built agents. Once implemented, these agents can free up 21 to 30 percent of capacity in areas such as wet labs, data analytics, and regulatory support, which can be redirected to expand the research pipeline or accelerate the progression of candidate drugs to trials.

With agentic AI, work for early-stage drug discovery and scientific exploration can be reimagined in the following ways:

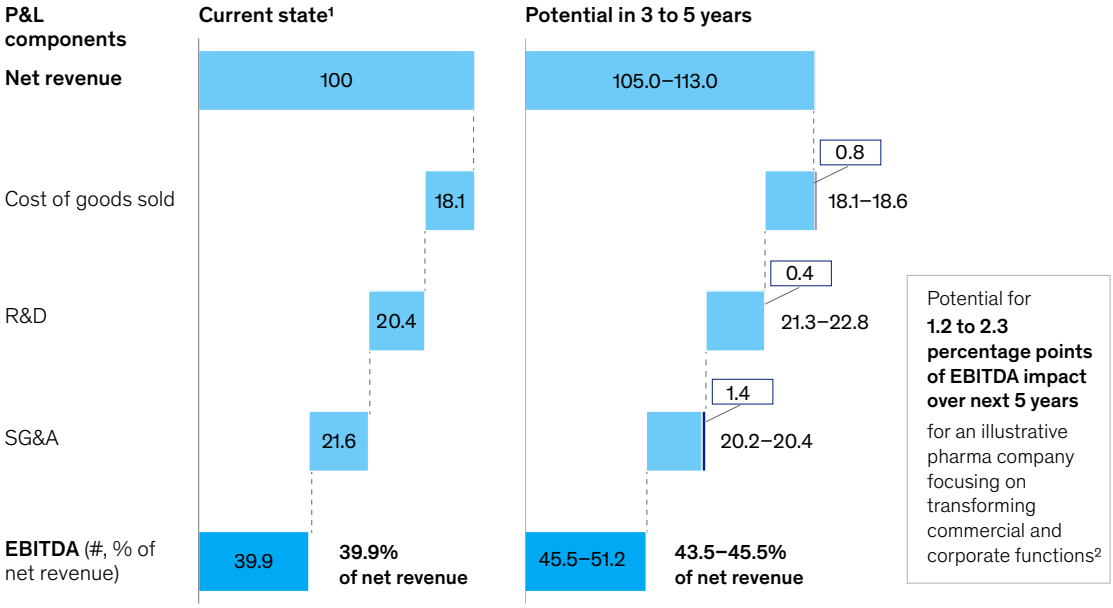
Autonomous data analysis and insight generation: An analytic agent can assist scientists by automatically preparing detailed data analyses of experimental data aggregated by a curator agent. The analytic agent would perform statistical analysis and visualizations, which are currently time-intensive tasks that require the expertise of highly trained scientific staff. The analytic agent can then work with a protocol-drafting agent, which suggests updates to the experiment protocols based on the

Exhibit 4, part 1

The full potential of enterprise-wide agentic transformation could boost top biopharmas' EBITDA by 3.4 to 5.4 percentage points.

Incremental profit and loss (P&L) impact for top pharma companies, not including baseline growth (indexed to 100)

x.x Spend on agents (tech and full-time employees)



¹Based on aggregate level of 21 large-cap biopharma companies from FY2024 financial statements (Eli Lilly, Novo Nordisk, AbbVie, Amgen, AstraZeneca, Bristol Myers Squibb, GSK, Pfizer, Roche, Novartis, Merck & Co, Johnson & Johnson, Sanofi, Daiichi Sankyo, Gilead, Astellas, Takeda, Vertex Pharma, CSL, Biogen, and Regeneron); Johnson & Johnson, Merck & Co, Sanofi, and Roche based on only pharma business.
²Includes HR, legal, and tech delivery.
Source: Company financial statements; expert interviews; McKinsey Value Intelligence Platform

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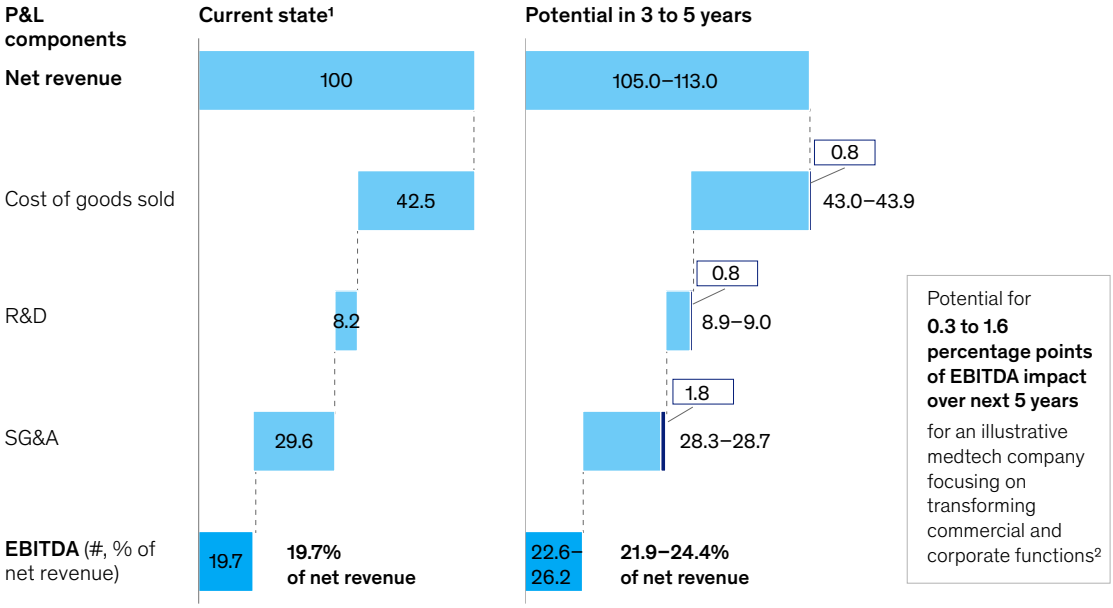
Agent-based AI can generate substantial benefits in six life sciences battlegrounds.

Exhibit 4, part 2

The full potential of enterprise-wide agentic transformation could boost top medtechs' EBITDA by 2.2 to 4.7 percentage points.

Incremental profit and loss (P&L) impact for top medtech companies, not including baseline growth (indexed to 100)



¹Based on aggregate level of 10 large-cap medtech companies from FY2024 financial statements (Medtronic, Boston Scientific, GE Healthcare, Edwards Lifesciences, Stryker Corporation, Intuitive Surgical, Abbott, Phillips, Baxter, and Johnson & Johnson); Johnson & Johnson based on only medtech business.
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latest findings. The human scientist reviews and adjusts these suggestions, enabling faster iteration and improved experiment design.

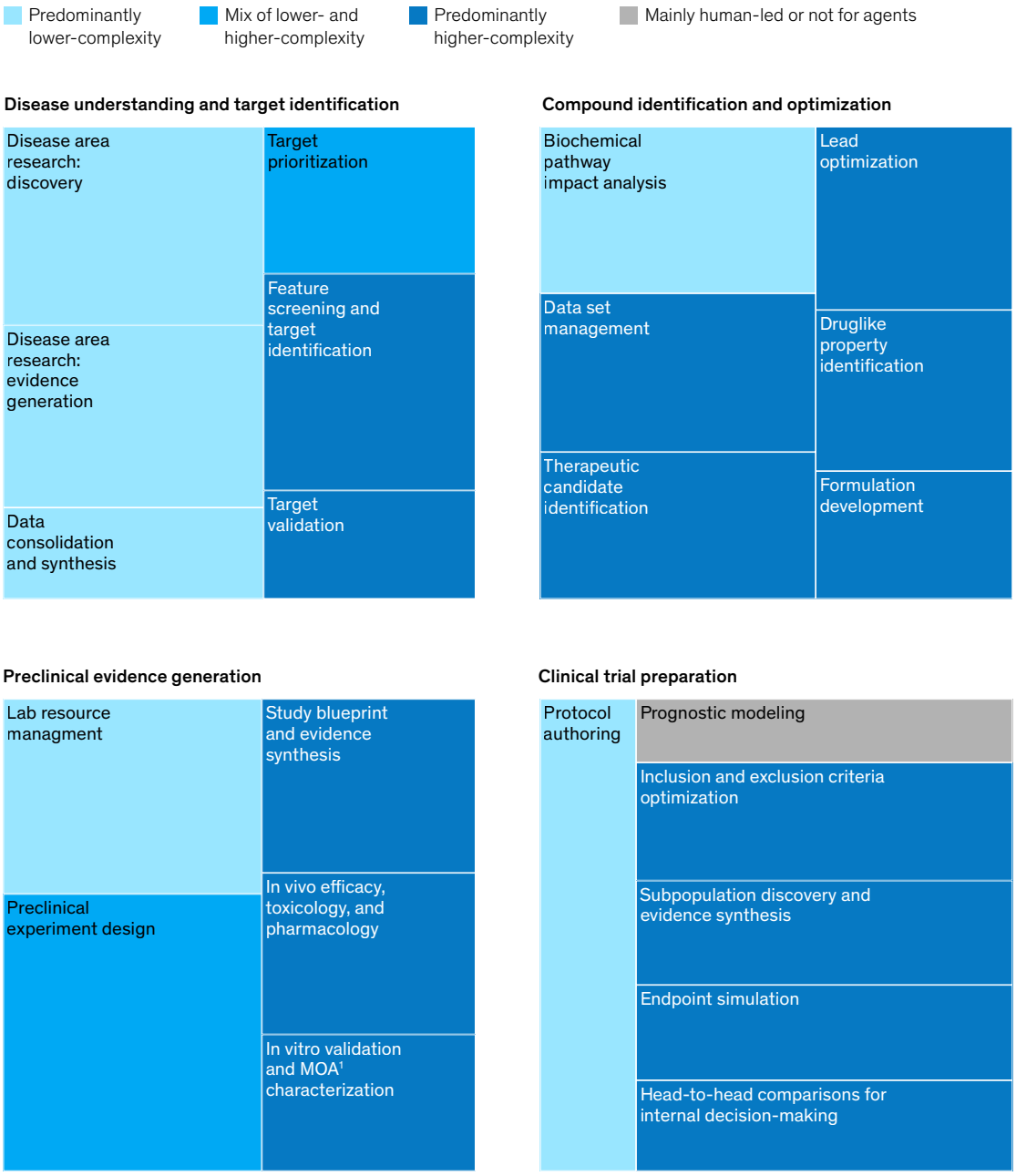
Data-driven drug-candidate selection: A key function of the drug discovery team is to evaluate drug candidates for a specific target. Traditionally, these decisions relied heavily on early preclinical efficacy experiments and expert opinions. With AI agents, the team can benefit from a much richer set of inputs. AI agents can synthesize insights from the latest literature and trial data compiled by a literature-explorer agent, perform in silico modeling of success probabilities using real-world data, multiomic analyses from the data-science agent, and endpoint simulations from the feature-generation agent, creating a prioritized list of potential drug candidates. With the help of these agents, the team can efficiently review and approve this list for the next stage of screening and testing, significantly improving and hastening the decision process.

Accelerated regulatory submission preparation: A regulatory-drafting agent could autonomously compile the latest efficacy and toxicology testing data into a submission-ready document. What once took a week or two of manual effort now only requires the scientist a few hours to review and finalize. By automating the drafting process, the regulatory-drafting agent not only reduces timelines but also ensures compliance with

Exhibit 5

Most workflows in research and early development can benefit from agents.

Relative value at stake by workflow, with type of agent



[1]Mechanisms of action.

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regulatory standards, allowing the scientist to focus on higher-value tasks, such as strategic innovation and building relationships.

Several large pharmaceutical companies are actively leveraging AI, including agentic AI, to speed up various stages of drug discovery and development. One has a collaboration with a company that integrates AI and robotics for drug discovery. It uses AI-powered platforms for molecular modeling, crystal structure prediction, and screening to identify and improve small-molecule drugs. The AI autonomously performs complex calculations and predictions to reduce the list of potential drug candidates and optimize workflows.

2. Pharma development: Accelerating clinical trials and enhancing patient journeys

Agentic AI can help companies conduct clinical trials faster, more efficiently, and with higher quality while also improving the patient experience. Although study teams have already been working toward these goals using digital tools, AI, and gen AI, we expect a major shift to come about once agents are more fully implemented. Agents are no longer just tools for study teams; they are evolving into intelligent partners that collaborate with teams throughout the clinical trial process and can operate semiautonomously to handle a wide range of workflows. Over the next five years, we expect this to lead to a 35 to 45 percent boost in productivity in clinical development that will benefit every function (Exhibit 6).

Agents can also shorten timelines, delivering medicines to patients more quickly and accelerating revenues, and enhance decision-making and execution, thereby increasing the likelihood of demonstrating the efficacy and safety of novel treatments.

We see agents performing seven key roles in development:

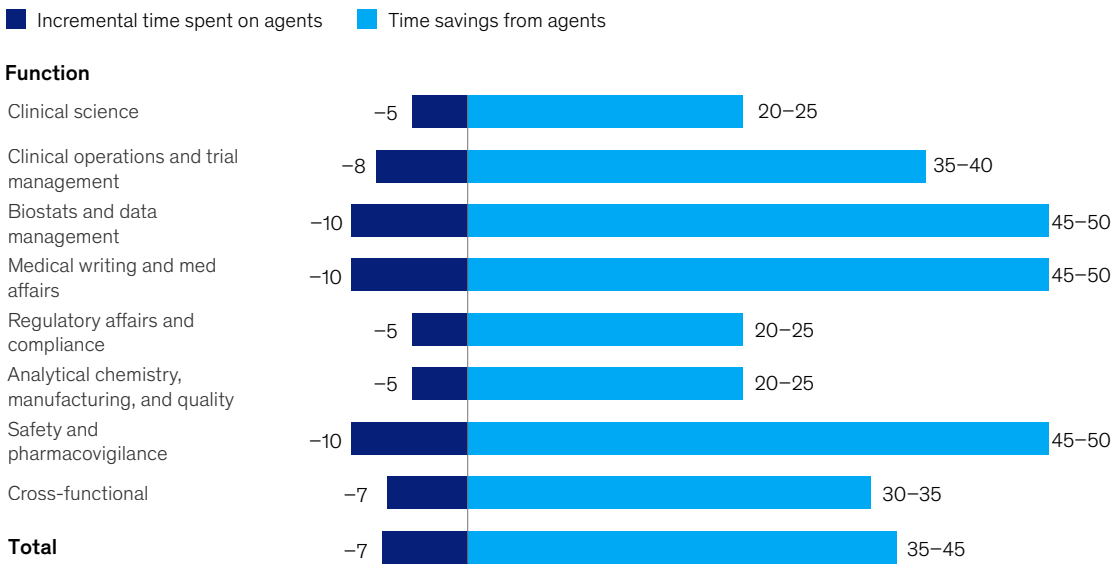
1. optimizing trial designs informed by agentic retrieval of benchmarks and data, with scenarios designed using machine learning (ML)

2. orchestrating sites, vendors, and sponsors for site start-ups

Exhibit 6

Agents can benefit roles in every clinical development function.

Work hours shifted by agentic workforce, % of function capacity



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3. managing clinical data from one-click electronic data capture design through anomaly detection and query triage

4. engaging sites and principal investigators with hyperpersonalized, multimodal messages

5. managing trials, including root cause investigations and next-best-action recommendations

6. assembling submission materials informed by regulatory intelligence

7. automating document production throughout the trial life cycle

Here is how three of these would work in detail:

Trial design: A clinical-trial benchmarking agent identifies similar trials and establishes benchmarks for key metrics such as enrollment rate. Meanwhile, a literature-explorer agent evaluates the competitive landscape and unmet needs. Both agents send their outputs to a trial-optimizer agent that uses ML and simulation tools to refine the trial design, under the supervision of a human clinical scientist. Once the design is finalized, a document-generation agent generates a draft of the protocol in minutes, using a library of design elements such as endpoints, and refines the draft through feedback from a critic agent and a human clinical scientist. This approach could enable companies to design trials 50 percent faster with 25 percent fewer amendments.

Study start-up: A site feasibility agent creates site questionnaires based on the trial protocol and compiles the responses. The start-up selection agent then uses ML-based site selection to produce a prioritized site list of predicted high-performing sites for the study start-up team to review and confirm. A site contracting agent then automatically drafts "first time right" site contracts based on fair market value benchmarks, site potential, and site-specific precedents, speeding up contracting processes. The process then moves to the document drafting agent, which automatically drafts site-specific documents such as the investigator brochure and site initiation visit materials, enabling the start-up team to quickly activate the sites. This agentic approach could double site activation rates with 30 to 50 percent fewer staff.

Clinical data flow: At the beginning of trials, the case report form (CRF) design agent extracts structured protocol metadata to create annotated CRFs, which are then provided to the electronic data capture configuration agent to support quicker database setup. During the trial, the data entry agent flags delays in data entry and involves clinical research associates to ensure CRFs are completed. Meanwhile, the query generation agent detects anomalies in the data and automatically raises relevant queries. These queries are handled by a data cleaning agent, which flags complex queries for human review. Once the database is locked, the programming agent produces analysis datasets and results tables from the collated data, with a human biostatistician providing input for nonroutine datasets. This process could boost productivity in data management and programming by 60 percent, while reducing database build timelines from two to three months to under two weeks.

One major pharmaceutical company has adopted a multi-agent trial copilot to improve its oversight of the development process. The clinical operations team works with a supervisor agent that manages a group of specialized agents focused on site activation, subject enrollment, data management, and analyzing longitudinal trends. These agents use data from the company's clinical control tower, including portfolio, trial, and site information, to provide real-time, actionable insights and initiate proactive interventions to support on-time trial completion. The company plans to give its agent teams more independence in the future, including engaging principal investigators and clinical research associates for routine tasks.

3. Medtech research and development: Accelerating innovation and prototyping

By automating complex tasks such as prototyping, design controls, patent filing, and risk management, agents could free up 15 to 20 percent of capacity for R&D teams, allowing them to focus on higher-value activities, including strategic innovation, partnerships, and designs centered around patients and healthcare professionals (HCPs). This

acceleration would shorten the time to market for life-saving medical devices. Also, improved decision-making and risk mitigation could lead to safer, more effective devices that better meet patient needs, boosting clinical and commercial success.

Agents could support medtech R&D teams in a variety of ways:

Prototyping and design controls: Prototyping is essential in medtech R&D, where engineers improve device designs and manufacturing to meet requirements. Agents could transform this process and assist teams by autonomously creating and testing virtual prototypes. A design-simulation agent could analyze specifications, simulate performance, identify flaws, and suggest improvements early. A compliance agent could compare prototypes to standards and flag noncompliance in real time.

Innovation mapping and patent filing: In the medtech sector, it is crucial to stay at the forefront of innovation. Agents can transform how R&D teams identify opportunities and safeguard intellectual property. An innovation-mapping agent could scan defined sources of patents, industry literature such as journals, and trade publications to discover emerging technologies and trends, then compare these to existing products and solutions to identify unmet needs and opportunities for research. This agent could generate a prioritized list of opportunities along with competitive analyses, which could be designed and prototyped with agentic assistance. Once a concept is developed, a patent-drafting agent could prepare the initial submission, ensuring legal and technical compliance. Automating these tasks would help R&D teams find high-value opportunities more quickly and better secure their IP.

Design controls and regulatory readiness: Once a design has been finalized, a documentation agent could generate design-control files based on specifications, reducing design time. Risk management is vital in medtech R&D to ensure device safety and efficacy. Agents could streamline this by automatically identifying, assessing, and suggesting mitigations for risks throughout the product life cycle. A risk-assessment agent could analyze design inputs, manufacturing, and post-market data to create a risk profile. A risk mitigation agent could recommend design or process changes using predictive modeling. And for regulatory readiness, a submission agent could compile the necessary documents, reducing risk-management efforts by 15 percent.

As an example, a leading medtech company is already leveraging agentic AI to transform its product and software development processes. The company has implemented a multi-agent

By automating certain complex tasks such as prototyping, agents could free up 15 to 20 percent of capacity for R&D teams.

system to tackle key challenges such as managing interdependencies between systems and teams, tracking delivery, and consistently maintaining quality in more complex products and devices. Specialized agents now oversee critical tasks, including software testing, design iteration, and risk mitigation, while a central AI supervisor with human oversight coordinates these efforts to ensure smooth integration among teams and systems. By automating routine tasks and providing real-time insights, the company has greatly enhanced its ability to manage complexity and deliver high-quality products on schedule.

4. Commercial pharma and medtech: Elevating customer engagement and market success

Commercial organizations in both pharma and medtech are grappling with rising complexity in engagement, increasing demands for personalization from HCPs and patients, an evolving policy environment, and cost constraints. Internal processes from brand planning to field enablement remain fragmented and inefficient, burdened by manual workflows and legacy systems. In pharma, companies' growing dependence on a sprawling network of external vendors is making cost structures unsustainable.

Agentic AI can help by taking on time-consuming activities like drafting brand plans or preparing contracts, freeing up teams to focus on strategic execution. They can also unlock new capabilities that were previously out of reach, including real-time insights for decision-making; self-service content creation; automated first-pass medical, legal, and regulatory reviews; and personalized pre-call planning for field representatives. These initiatives could translate into a 4 to 8 percent increase in revenues and a 5 to 9 percent reduction in commercial spending over the next five years.

Here are three transformations that can be enabled by agentic AI in commercial:

Sales engagement: Agentic AI can transform sales operations in life sciences. Intelligent assistants can redefine account representative engagement by supporting pre- and postcall activities, such as HCP and territory planning, capturing insights from individual interactions, automating follow-up tasks, and providing personalized coaching feedback to reps. These tools can help identify trends early and enable personalized, data-driven engagement by synthesizing clinical evidence, product info, and engagement data in a conversational format. Virtual sales platforms can extend reach to hard-to-access territories and HCPs in a compliant, scalable way, adding value to the HCP experience. These innovations could reduce the burdens of sales representatives by 15 to 25 percent and increase revenue by up to 3 percent through improved targeting and stronger relationships.

Marketing: Agentic AI is revolutionizing marketing workflows in strategic planning, content creation, review, campaign development and execution, and performance tracking. Self-serve platforms let marketers produce content independently, reducing their reliance on agencies and speeding up turnaround times. Automated pre-MLR (medical, legal, and regulatory) review systems identify common issues before formal review, decreasing cycle times and improving compliance. Unified platforms that aggregate internal and external data, with conversational interfaces, help marketers understand brand performance and patient and HCP needs. These tools automate tasks, speed execution, and provide intelligence to enhance responsiveness to changes in the market.

Market access and payer engagement: Agentic AI can enhance market access and payer engagement through increased automation, better decision-making, and minimized value leakage. Advanced gross-to-net optimization can simulate complex access scenarios at brand and portfolio levels, helping to inform trade-offs that were once difficult to make. A contracting-intelligence platform can enable smarter contract decisions by analyzing past deals, modeling potential outcomes, and guiding negotiation strategies. Several manual tasks can also be automated, including creating initial contract drafts, monitoring performance, and tracking compliance. Automated invoice auditing can ensure contract terms are upheld and identify discrepancies early. Together, these innovations can reduce manual workload, boost financial results, and support more strategic, data-driven decisions while fostering more consistent and effective engagement with payers.

5. Pharma and medtech operations: Accelerating execution and decision making

Life sciences operations face many challenges, including high interdependence between subfunctions and the need for time-critical decision-making and extensive quality and compliance documentation. These issues can be addressed with tailored agents or groups of agents, which can speed up processes and boost efficiency by improving metrics like service levels, forecast accuracy, manufacturing throughput, deviation rate, and cycle time for document creation. Agent-based AI could help with 75 to 85 percent of workflows in operations, reducing the time required for key tasks in supply chain, procurement, manufacturing, product development (CMC), and quality by 25 to 35 percent (Exhibit 7).

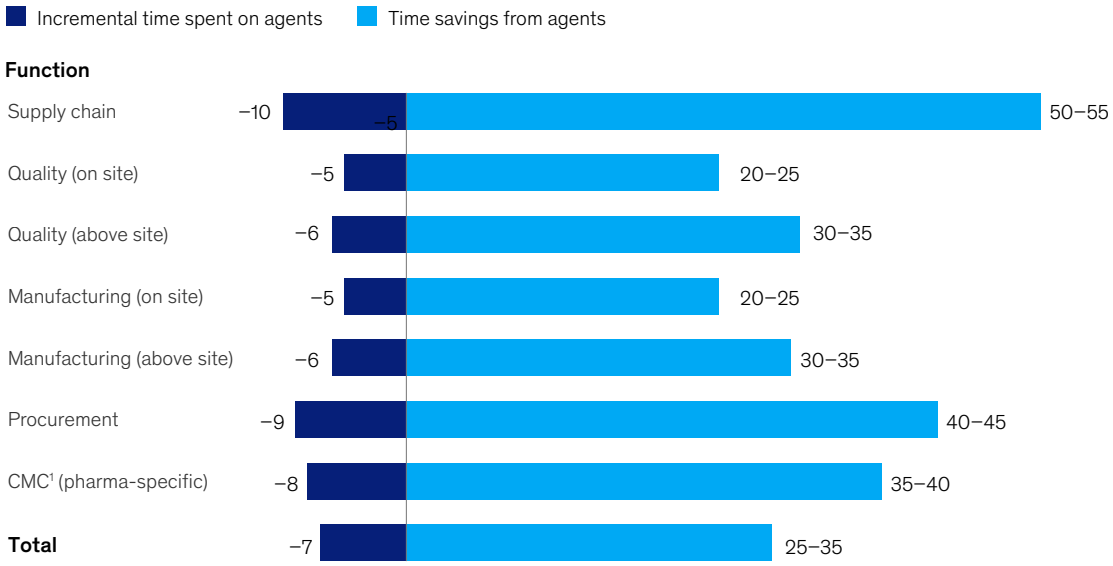
Here are three ways in which agentic AI can improve operations:

Solving interdependencies with cross-operations planning: Integrated end-to-end operations planning—which is essential to optimizing production and ensuring product availability—requires alignment among enterprise functions. Orchestrating agents can enable multifunctional interactions, eliminating delays from inefficient communication and approval processes. Agents can connect components such as supply planning, raw material supply, and manufacturing by reacting to external factors such as demand fluctuations. This integration transcends

Exhibit 7

Agents can shift workforce hours across operations functions.

Work hours shifted by agentic workforce, % of function capacity



[1]Chemistry, manufacturing, and controls.

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boundaries, providing teams with visibility into inputs, outputs, and decision-making. For example, a supply chain planning agent can ingest demand signals to simulate scenarios and create forecasts, which a production planning agent can then use to schedule batches. A raw materials agent can monitor inventory levels to trigger reorders, ensuring the availability of raw materials.

Automating decision-making: Agentic AI tools can improve decision-making and accelerate processes in all operations. To improve decision-making, multicomponent platform servers can be set up as middleware that allows agents to access data in a structured way, providing better contextual awareness of multistep tasks. Agents help identify changes in signals to process inputs and execute optimization decisions.

For example, in plant operations, by directly connecting to manufacturing execution and process-information systems, agents can detect and respond to deviations in real time. They can increase yield and product quality by adjusting bioreactor parameters such as pH and O_2 and modifying machine settings like pressure, temperature, and linear motor speed for fully automated medtech manufacturing lines.

Procurement category management agents can track changes in raw material supply and commodity prices to initiate targeted negotiations. Negotiation agents can coach procurement managers to negotiate with suppliers. Supplier management agents can observe suppliers' performance metrics and detect negative trends, such as in service levels, before they significantly affect operations.

Accelerating document generation: Operations teams spend a lot of time manually drafting good manufacturing practice documents for on-site and above-site workflows. Two types of documentation agents can help ease this burden.

The first type creates templates for standardized documents by using historical reports and good documentation practices requirements to draft initial versions of standard operating procedures, deviation and corrective and preventive action reports, validation protocols and reports, change control impact assessments, and technology transfer documents, drastically reducing the labor hours needed. These agents can also generate engineering and maintenance reports, such as equipment failure mode and effects analyses and preventive maintenance plans, along with procurement documents such as contracts and requests for proposals.

The second type of document agent connects to data sources, such as laboratory information management system testing results and manufacturing execution system process parameters, to generate near-final drafts of documents such as supplemental biologics license application filings for technology transfers.

Pilots and early assessments show that documentation agents can achieve 75 to 80 percent productivity gains for initial document generation. Additional benefits are possible through collaboration with document review agents that ensure compliance with regulatory and quality standards. End-to-end document generation and review agents can cut turnaround times from weeks to hours, enabling cross-functional teams to concentrate on final review and approval.

6. Information technology: Transforming IT operations and driving innovation

Agentic AI can revolutionize how IT organizations develop and manage technology.

Agent-powered application development: The integration of agentic AI into software development is transforming how digital products are designed and built. Instead of relying on product analysts to write user stories, designers to create mockups, and QA analysts to develop test scripts, agents can generate all these components with less oversight. Developers can assemble code using natural language commands rather than traditional programming languages. AI can handle routine coding tasks efficiently, analyze design patterns, and suggest improvements, allowing human designers to focus on creativity and strategic planning. This streamlined process accelerates development and improves the quality of new software products.

Unlocking the full potential of agentic AI in life sciences requires a strategic, organization-wide approach that redefines workflows, roles, and human–agent collaboration.

Automation of IT operations: As AI technology advances, traditional IT operations will experience significant changes. Tasks such as issue detection, event correlation, and service-request fulfillment can be fully automated. Agentic AI systems can update continuous integration and continuous delivery pipelines enterprise-wide as policies evolve, disseminate insights from new software updates to every deployed system, and perform automated threat monitoring. AI-driven systems can predict and resolve issues before they affect operations, ensuring smoother and more reliable IT services. This automation can save costs, improve service quality, and increase user satisfaction.

Accelerating legacy system migration with intelligent automation: Agentic AI can streamline the migration process to modern enterprise systems by automating complex and time-consuming tasks for development teams. Migration agents can analyze legacy systems, map data structures, and identify dependencies to ensure a smooth transition. These agents can also verify data integrity, detect inconsistencies, and automate data cleansing, reducing errors and manual effort. Using AI-driven insights, organizations can accelerate their migration timelines, minimize disruptions, and achieve a seamless transition to the new environment, enabling faster realization of business value. As many organizations rely on systems that are nearing the end of their life cycles—such as enterprise-resource planning—this acceleration is critically needed.

While the opportunity to transform IT with AI is real, so too is the burden it will create for IT. Business units and functions are deploying new AI faster than ever and are increasingly experimenting with new technology that is easier to build and deploy. This could create a complex technology landscape that, if left unmanaged, will become the next tranche of legacy systems that will be challenging to operate and keep up-to-date.

A Fortune 500 company launched a $600 million initiative to upgrade its aging systems, which included 400 applications, but faced challenges due to slow manual coding processes and inconsistent coordination. AI tools were used to automate code conversion, but they did not significantly accelerate the process. Human workers migrated to supervisory roles, managing teams of more than 100 AI agents responsible for documentation, coding, and testing. This change cut time and effort by over 50 percent. Specialized teams of agents worked on specific features, with their work reviewed and coordinated by other agents. Human supervisors ensured the smooth execution of these agent-managed tasks.

The path to implementation

Unlocking the full potential of agentic AI in life sciences requires a strategic, organization-wide approach that redefines workflows, roles, and human–agent collaboration. Our Rewired framework offers a concrete foundation to approach this.[5] To ensure successful implementation at scale, organizations must focus on several critical enablers:

1. *Guide from the top*: A clear, top-down mandate from leadership is essential. Leadership's

[5] "Rewired and running ahead: Digital and AI leaders are leaving the rest behind," McKinsey, January 12, 2024.

focus should be on aligning agentic AI's value-creation potential with corporate strategy rather than on technology challenges. Leadership must steer clear of small, incremental improvements by championing a bold vision, setting ambitious goals, and ensuring accountability across functions.

2. *Reimagine workflows*: Operational leaders should strive to reimagine work in their domains. This involves identifying high-value workflows that can incorporate agents, providing every user with intelligent interfaces to access agent capabilities, and encouraging a culture of innovation and experimentation. A thorough understanding of current processes and the capabilities of agentic AI is essential, from leaders down to the front line.

3. *Invest in people*: Many roles will change from doing manual and repeatable tasks to setting goals and steering AI agents. Traditional process and people management will migrate toward supervising hybrid teams, leading to changes in organizational structures. Employees will need new skills and tools to activate and supervise agents and overcome the cultural and organizational barriers to adoption. Additionally, new business processes will be needed to measure, monitor, and improve the performance of the agentic workforce. The talent function will play a significant role in managing these transitions and can begin exploring the implications now.

4. *Build scalable foundations*: To maximize the benefits of AI agents, organizations can invest in flexible interconnected networks of AI agents that enable their rapid development, deployment, and management.[6] These "meshes" include modular, cloud-based architectures that can handle increasing complexity and volume, as well as lower-complexity agents that empower nontechnical users to create and customize agents. Agent-to-agent interoperability and the ability to coordinate multiple agents will be key to success. Scalability also requires a robust data infrastructure to ensure agents have access to high-quality, real-time data. Managing data well is key to success and includes aligning the organization on data ontologies and ownership. Strategic partnerships with technology providers and start-ups can provide access to cutting-edge innovation.

5. *Establish robust change-management to ensure adoption and value at scale*: The transformative potential of agentic AI requires a robust and sustainable change-management strategy. Efforts should include role modeling by executives, a compelling change story, training, ongoing coaching, and incentives to encourage and reward adoption. It should also involve integrating agents into existing business processes, such as management reviews, quarterly business reviews, and sales performance evaluations, along with mechanisms to gather and incorporate feedback.

6. *Set risk management and governance guardrails*: As agentic AI becomes embedded in critical workflows, it's best for organizations to establish strong governance frameworks to ensure ethical use. These include clear accountability for decisions made by agents, guardrails to prevent unintended consequences and ensure compliance with regulatory requirements, regular audits, and bias-detection mechanisms.

7. *Foster a culture of continuous learning*: The implementation of agentic AI is a long-term learning challenge for employees and companies. Leaders should establish a strategy for continuous learning and adaptation, including a safe environment for experimentation and a structured approach to skill-building. Organizations must continuously monitor technological advancements, assess new capabilities, and improve their own implementations.

[6] "Seizing the agentic AI advantage," QuantumBlack, AI by McKinsey, June 13, 2025.

8. *Mobilize an agent factory*: A small, centralized group with leadership support can ensure agentic AI is deployed toward the most impactful use cases. The group can facilitate the process for reimagining workflows in collaboration with domain leaders, contribute relevant technology expertise, monitor impact and adoption metrics, and help remove roadblocks to deliver the transformational potential of agentic AI.

By addressing these dimensions holistically, life sciences organizations can harness the transformative power of agentic AI to propel innovation, achieve sustainable competitive advantage, and, most importantly, improve patient outcomes.

Defining tomorrow

The true power of agentic AI lies in its ability to amplify human ingenuity, freeing teams from mundane tasks and unlocking entirely new possibilities for discovery and value creation. By embracing these systems, life science companies can redefine the limits of innovation, accelerate breakthroughs, and deliver life-changing therapies to patients with unprecedented speed and precision. We anticipate that pharmaceutical and medtech companies that embrace this transformation will operate radically differently and more competitively five years from now, with benefits accruing in the meantime. Are you ready to reimagine what your organization could achieve with an agentic workforce alongside your people?

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