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Pharma AI Change Management: Upskilling and Literacy

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Executive Summary

Pharmaceutical research and development is undergoing a profound transformation driven by artificial intelligence (AI). From early discovery through clinical trials, manufacturing, supply chain, and commercial operations, AI promises to reduce costs and timelines, improve success rates, and unlock new therapeutic insights (moneyweek.com) (www.strategyand.pwc.com). However, realizing these benefits requires far more than deploying new algorithms. Critical to success is **building AI literacy and readiness across the organization**, from bench scientists to corporate executives, and managing the cultural, governance, and workforce changes that accompany AI adoption (pharmadispatch.com) (eularis.com). Recent surveys and industry analyses paint a consistent picture: while a majority of life-science executives recognize AI as an **urgent priority** — with 70–85% characterizing it as “immediate” (www.fiercepharma.com) and most companies planning to expand AI use substantially in the next 1–2 years (www.axios.com) (www.pistoiaalliance.org) — a large skills gap and organizational barriers threaten to slow progress

(www.pistoiaalliance.org). For example, the Pistoia Alliance found that **77%** of life-science laboratories expect to use AI within two years, but **34%** cite a shortage of skilled personnel as a key obstacle (www.pistoiaalliance.org).

Leading companies are addressing this gap by **embedding AI training into workforce upskilling programs**. Johnson & Johnson, for instance, mandated a generative-AI training course for all employees and has trained over 56,000 of its 138,000 staff (b17news.com). Merck supports employee AI skills through an enterprise-wide training program (Merck). In its 11 April 2025 update, AstraZeneca reported **over 12,000 participants** in its enterprise-wide AI upskilling programme, which offers Bronze, Silver and Gold certifications (AstraZeneca). Sanofi similarly requires its leaders to undergo AI literacy training so they do not become “blockers” in AI-driven initiatives (pharmadispatch.com). These efforts underscore a fundamental insight: *AI adoption is as much about people and processes as it is about technology*. Industry experts emphasize that AI projects commonly fail due to lack of human readiness rather than technical shortcomings (eularis.com) (www.epam.com). In its November 2025 synthesis of interviews with pharma leaders, McKinsey reported that substantially shorter development timelines and improved preclinical or clinical success rates had yet to become evident (McKinsey).

This report examines the **change management challenge in pharma AI adoption**, with a focus on building AI literacy and readiness “from lab to boardroom.” We review the historical context of digital transformation in pharma and the current state of AI integration. We analyze data and case studies showing how companies are upskilling and reorganizing to exploit AI, and we explore frameworks for guiding this change (e.g., leadership mindsets, communication, governance). Multiple real-world examples are highlighted, including Sanofi’s responsible-AI framework and employee training, AstraZeneca’s accreditation program, and others. Finally, we discuss the future outlook: how AI literacy will reshape pharma strategy, what new roles and skills will emerge, and how organizations can sustain an AI-empowered culture that continuously learns and adapts. All claims are supported by industry surveys, expert reports, and peer-reviewed analysis (www.mckinsey.com) (www.pistoiaalliance.org).

Introduction and Background

The AI Opportunity in Pharma

Artificial intelligence (AI) – encompassing machine learning, deep learning, natural language processing, and (more recently) generative AI – is poised to dramatically accelerate pharmaceutical innovation. AI techniques are being applied across the drug value chain: for example, *target identification* (e.g. predicting new protein targets), *molecular design* (e.g. generative models that suggest novel compounds), *preclinical in silico studies*, *patient stratification*, and even post-market safety monitoring. Breakthroughs like DeepMind’s AlphaFold (2021) have already revolutionized long-standing bottlenecks (by predicting protein structures from sequences (www.intechopen.com)). AI can automate or augment labor-intensive tasks – such as analyzing large genomics datasets, designing chemical libraries, drafting regulatory documents, or personalizing medicine – enabling far faster cycles of experimentation and decision-making (b17news.com). The FDA notes that AI use in drug development and regulatory submissions has increased since 2016 (FDA). Strategy& (PwC) estimates

that pharma companies industrializing AI use cases across their organizations could roughly **double their operating profit** (Strategy&). In short, AI has the potential to uncover efficiencies and breakthroughs that would be economically and scientifically transformative for pharma.

The Influence of Past Digital Transformation

While AI is revolutionary, the pharmaceutical industry is no stranger to digital innovation. For decades, pharma R&D has adopted advanced technologies (e.g. high-throughput screening, genomics, computational chemistry). Starting around 2016–2020, the concept of "Pharma 4.0" – analogs of industrial automation and data-driven workflows – led to digitalization initiatives in manufacturing (smart factories), supply chain (blockchain/Digital Supply Chain), and quality systems (electronic batch records). Early AI efforts were often prototypes or stand-alone: rule-based expert systems for chemical reactions, algorithmic pharmacokinetic models, or ML applied to medical imaging. But today's AI (especially deep learning and generative models) is far more powerful and general-purpose. The FDA notes that " [s]ince 2016, the use of AI in drug development and in regulatory submissions has exponentially increased" (www.fda.gov). Many large companies (J&J, Roche, Merck, Novartis, AstraZeneca, etc.) now report active AI projects, and even biotech startups start with AI-driven strategies from day one.

Workforce readiness remains an obstacle to AI adoption. In the Pistoia Alliance's 2025 Lab of the Future survey, **34%** of respondents cited a lack of people as a barrier to AI adoption, up from **23% in 2024** (Pistoia Alliance).

AI in Pharma Today: Enthusiasm and Caution

Given the opportunity, pharmaceutical companies are eagerly investing in AI. According to McKinsey, global corporate investment in AI exceeded **$250 billion** in 2024, and the pharma AI market alone is forecast to grow from **$4 billion (2025)** to **$25.7 billion by 2030** (www.mckinsey.com). In industry leader roundtables, executives underscore that AI will *transform* drug discovery and development – but must be integrated thoughtfully. For example, McKinsey's pharma podcast noted that "AI deployment…isn't just about adding technology to accelerate existing processes," but about **"complete reimagining"** of R&D workflows and business processes (www.mckinsey.com).

Industry surveys attest to this mix of excitement and realism. A July 2025 Define Ventures report of leading pharma executives found that 70% of leaders call AI an "immediate priority" and 85% of the largest pharma firms hold the same view (www.fiercepharma.com). Correspondingly, over **80%** of these companies are *expanding* their AI budgets (www.fiercepharma.com). Yet, executives also recognize that ROI has been slower than hoped: AstraZeneca's CDO Jim Weatherall has noted that "progress on AI-driven drugs has been slower than hoped" largely because fundamental biology (e.g. cell-drug interactions) is still not well understood (moneyweek.com). MIT NANDA's preliminary July 2025 report identifies systems' ability to learn as a barrier to scaling enterprise generative AI (report). In pharmaceuticals specifically, a white paper observes that while many companies have experiments and pilots, **shorter development timelines or higher success rates are not yet evident** (www.mckinsey.com).

This divergence between potential and current results underscores the need to focus on the *human and organizational* factors. As Dr. Andrée Bates (Pharma AI expert) argues, AI projects tend to fail not for technical reasons but for human ones – "things don't work out as they should… almost always down to human rather than technical failure" (eularis.com). The table below summarizes some key survey data on AI adoption attitudes in pharma:

Finding	Source
75% of senior life-science executives have implemented AI in the past 2 years, and **86%** plan deployment in the next 2 years (www.axios.com). However, only ~50% have formal policies or audit processes in place.	Arnold & Porter survey, via Axios (www.axios.com)
70–85% of pharma leaders view AI as an *immediate* priority (85% among top-20 companies) (www.fiercepharma.com). >80% are **increasing** their AI budgets.	Define Ventures report (via FiercePharma) (www.fiercepharma.com)
77% of life-science labs expect to use AI *within 2 years*, and AI is the number-1 investment area. But **34%** cite lack of skills as an adoption barrier (up from 23% in 2024) (www.pistoiaalliance.org).	Pistoia Alliance Lab Survey (2025) (www.pistoiaalliance.org)
51% of lab professionals want best-practice guides on AI, 45% want AI/ML courses, 40% want skills training – reflecting the workforce's recognition of a skills gap (www.pistoiaalliance.org).	Pistoia Alliance Lab Survey (2025) (www.pistoiaalliance.org)

These findings illustrate the broad consensus: **AI is reshaping pharma's future**, but adoption is held back by organizational readiness (skills, culture, governance) rather than lack of technical capability.

The Core of the Challenge: AI Literacy and Skills Gap

What is "AI Literacy" in Pharma?

AI literacy can be defined as the knowledge, skills, and mindset required to understand **what AI can and cannot do**, and to use AI appropriately in decision-making. In practice, AI literacy for pharma must span multiple layers of the organization:

- **Scientists and Lab Staff (Bench to Clinical Practitioners)** need the technical awareness to employ AI tools in their daily work. This includes understanding how AI models (e.g. for target identification or image analysis) work, recognizing the data requirements and limitations, and knowing when to trust model outputs versus when to seek further validation. They also need basic data literacy (ensuring quality of inputs, understanding biases) and the skills to work collaboratively with data scientists. For example, wet-lab researchers must learn to frame their discovery problems in data-driven terms and to interpret AI-generated hypotheses (eularis.com) (b17news.com).
- **Data Scientists and AI Teams** need a deep grasp of both AI technology and pharmaceutical domain knowledge. Cross-functional expertise ("trilingual" in biology, data science, and business) is critical (www.mckinsey.com). These teams must also be attuned to regulatory constraints and company-specific

requirements (e.g. validation standards for AI tools in drug development).

- **Line Managers and Business Units (e.g. R&D, Production, Commercial)** require AI literacy to **identify high-value use cases**, integrate AI tools into workflows, and manage change. They need to ask the right strategic questions: What business problem will AI solve? How to measure ROI? Which internal processes need redesign? Managing AI adoption requires an ability to set goals, allocate resources (including potential partnerships), and align AI projects with departmental objectives (www.pharmexec.com) (www.mckinsey.com).
- **Executive Leadership and Board** need AI literacy to set the organization's strategic vision. While they need not write code, they must understand AI's potential and limitations well enough to avoid unrealistic expectations or dismissals (eularis.com) (www.ekipa.ai). For executives, literacy includes: recognizing which investments will drive competitive advantage, understanding ethical/regulatory implications of AI (e.g. patient privacy, algorithm transparency), building governance frameworks, and fostering a culture that balances innovation with risk management (catalant.com) (www.ema.europa.eu). As Dr. Bates emphasizes, *"we need AI literacy in the C-suite to develop strategic initiatives that have the potential to succeed"* (eularis.com).

In summary, AI literacy is **multifaceted**: it involves (a) **technical understanding** (how AI models work, data needs); (b) **strategic insight** (how AI aligns with business goals, ROI metrics); (c) **ethical/regulatory awareness**; and (d) **change leadership skills** (communication, training, culture-building). Table 1 (below) adapts these ideas into core competency areas for pharma leaders, based on industry guidelines (www.ekipa.ai):

Competency Area	Description (Pharma Context)	Leadership Actions
Strategic Vision	Understanding how AI applies to core pharma problems (R&D, trials, manufacturing, etc.) and linking AI to business goals.	Align AI projects with corporate strategy (faster trials, cheaper ops, etc.), define clear ROI metrics, and champion AI opportunities.
Data Acumen	Recognizing that **high-quality, structured data** is fundamental to AI success (www.ekipa.ai) (www.mckinsey.com). Pharma data (e.g. EHRs, lab logs) must be integrated and curated.	Invest in data infrastructure and pipelines (data lakes, cloud platforms). Advocate for data governance (FAIR principles (www.epam.com)) and foster a data-driven culture.
Risk & Compliance	Grasping ethical, legal, clinical risks of AI (bias, privacy, safety of AI-driven decisions). Understanding regulatory expectations (FDA, EMA) for AI in drug development (www.fda.gov) (www.ema.europa.eu).	Establish or engage a cross-functional AI governance council (including legal, compliance, medical) to vet tools and set usage policies (catalant.com). Incorporate AI ethics frameworks (e.g. Sanofi's RAISE (pharmadispatch.com)).
Change Leadership	Leading the cultural shift to integrate AI into everyday workflows. Creating clarity about "why" and "how" change adds value.	Communicate a clear AI vision to staff, involve peer "AI ambassadors" in training (catalant.com), provide hands-on learning (workshops, labs), and celebrate early wins. Address resistance proactively (course-correct failures).

Table 1. Core AI literacy competencies and leadership actions for pharma organizations (adapted from industry frameworks (www.ekipa.ai) (catalant.com)).

By investing in these competencies at all levels – scientists learning ML basics, managers learning to manage AI projects, and executives learning AI strategy and ethics – a pharma company can create an **"AI-ready" culture**. Multiple sources emphasize that **workforce education and cultural change** must be as much a priority as the technology itself (eularis.com) (www.mckinsey.com).

Quantifying the Skills and Literacy Gap

Many studies quantify the current gap between AI ambitions and workforce readiness in life sciences. Industry surveys and analyst reports consistently find that a **large fraction of employees lack the needed AI knowledge**:

- **Pharma Executives' Perspective:** According to FiercePharma's coverage of a Define Ventures report, *70%* of overall pharma leaders (85% of top-tier firms) say AI is an immediate priority (www.fiercepharma.com) – indicating leadership **recognizes** AI's importance. Yet the same report noted that 100% define success as reducing mundane work, implying AI is mostly used for efficiency so far. The report suggests companies are "decisively accelerating toward enterprise execution" of AI (www.fiercepharma.com), but also warns against superficial pilots.
- **Caution on ROI:** MIT NANDA's preliminary July 2025 report distinguishes individual productivity gains from profit-and-loss performance for widely used tools such as ChatGPT and Copilot (report). Organizations should measure those outcomes separately when assessing adoption and training.
- **Lab/Experimentation Reality:** The Pistoia Alliance's 2025 "Lab of the Future" survey (covering >200 pharma/biotech experts worldwide) paints a stark picture in labs: **77%** expect to use AI in their labs within two years, but **34%** now say "lack of people" is a barrier – up from 23% in 2024 (www.pistoiaalliance.org). Another key result: over half of labs **explicitly requested** AI education resources (51% want best-practice guides, 45% want AI/ML courses, 40% want skills training) (www.pistoiaalliance.org), underscoring that practitioners are keen but feel underprepared.
- **Global Data:** Broader workforce studies echo this. For example, **74–75% of data leaders** in one industry survey said their staff *urgently* need data/AI training (www.ekipa.ai). Gartner in 2018 had already warned 85% of AI projects will fail without proper data strategy (eularis.com). In summary, industry data make it clear that a large portion of the pharma workforce, and especially leadership, lacks formal AI skills and must be trained or brought up to speed in the near term.

Leadership Knowledge vs. Technical Skills

It's important to note that **AI literacy is not just academic or coding skills**. Many executives who may not code still need enough understanding to make good strategic decisions. As one report bluntly puts it: "AI is becoming a fundamental part of the job [for healthcare leaders] – not about learning to code, but developing the strategic vision to guide AI adoption safely and effectively" (www.ekipa.ai). In other words, **leaders must move from passive users to active sponsors.** They should avoid delegating AI entirely to tech teams;

instead they must engage with AI projects, ask informed questions, and ensure alignment with business objectives (pharmadispatch.com) (www.ekipa.ai). This mindset shift – which some call moving from "tinkering" to governance – is a key pillar of successful AI change management in pharma (catalant.com) (www.ekipa.ai).

Current State of AI Adoption in Pharma

AI Across the Drug Lifecycle

AI is already used in numerous ways across pharma functional areas. A few illustrative examples:

- **Drug Discovery:** Machine learning models sift through chemical libraries and biological data to identify promising targets and compounds much faster than traditional methods. Generative chemistry has started yielding real candidates (e.g. Insilico's AI-designed drug in <18 months (www.intechopen.com); AlphaFold's 3D protein structure predictions (www.intechopen.com)). AstraZeneca's data science lead notes AI is "applied throughout discovery… from target identification to clinical trials" (moneyweek.com). But progress is not purely technical – it requires large chemical/biological datasets (often proprietary) and integration with lab validation.
- **Preclinical and Manufacturing:** AI-driven models predict toxicity and ADME properties, reducing reliance on animal testing (www.intechopen.com). Some companies also apply AI in manufacturing "digital twin" simulations or quality control analytics, though details are often proprietary. For example, Aizon's case study reports that Recordati increased manufacturing yield by 1.5% and reduced cost of goods sold by 2% within three months of implementing the solution (Aizon). This shows tangible production benefits when data analytics are applied properly.
- **Clinical Trials:** Arguably the biggest impact could come via clinical operations. AI can **accelerate trial design and patient recruitment**, as well as monitoring and analysis. Algorithms can match electronic health record data to trial inclusion criteria orders of magnitude faster than manual review (time.com). Formation Bio describes its ambition as using technology and AI to make drug development more efficient (Formation Bio). AstraZeneca and Boehringer Ingelheim use AI to design adaptive trial protocols (e.g. simulating trial results using "digital twins" to reduce placebo arms) (www.mckinsey.com). Axios biotech roundtable speakers note that AI is being used to screen for genetically-driven diseases and to address patients' use of AI tools for health info (www.axios.com), reflecting both R&D and patient engagement roles.
- **Regulatory and Medical Affairs:** Large language models (LLMs) are starting to assist with regulatory writing, safety event coding, and literature review. For example, Sanofi's medical teams now use an internal generative AI platform to rapidly draft meeting minutes and answer procedural queries (pharmadispatch.com). Similarly, corporate affairs at Sanofi uses AI to draft and stress-test communications (ministry letters, etc.) (pharmadispatch.com). However, these use cases require strong oversight because regulatory filings (especially if they cross into "Software as a Medical Device") demand explainability and rigorous validation (pharmadispatch.com).

- **Commercial Operations:** AI-driven analytics are also working on supply-chain optimization, pricing, and sales forecasting. One executive noted that “agentic CRM” (AI-augmented customer relationship management) can free the field force to focus on high-value interactions (catalant.com). In marketing, some companies pilot AI to automate content tagging (reportedly tagging 60× more content at 94% accuracy (catalant.com)) and multi-channel campaign optimization. The overarching theme is that wherever there is large data or complex decision processes – from R&D pipelines to manufacturing lines to health economics – AI can potentially create value.

Despite these advances, adoption across pharma is still piecemeal. A recent Axios survey found **75%** of life-science companies have implemented AI in the last two years, which is high, but only about half have put governance policies around it (www.axios.com). Organizations are “feeling their way” in risk management (www.axios.com). Moreover, a Financial Times analysis noted that while AI-designed drug candidates are exciting, they still need extensive validation before reaching patients, and crucial biology gaps remain (moneyweek.com). Thus **AI tools are augmenting R&D rather than replacing deep expertise** – at least for now.

Key Barriers and Risks

Several common concerns shape the current state of AI in pharma:

- **Data Quality and Silos:** Pharma R&D generates massive data – e.g. genomics, clinical, manufacturing – but much of it is stored in silos (LIMS, paper records, disparate databases) (www.pharmexec.com). As one PharmExec analysis notes, data challenges “originat [e] further up the organizational hierarchy” and require corporate vision to address, not merely new software (www.pharmexec.com). Poor data (incomplete, biased, or inconsistent) leads to unreliable models and regulatory risk (www.intechopen.com) (www.mckinsey.com). Partnering tech (like GSK’s Onyx team to engineer data pipelines (www.mckinsey.com)) or adopting industry standards (FAIR data principles (www.epam.com)) are necessary steps that many pharma firms are still building.
- **Talent and Skills Shortage:** Beyond general upskilling needs, the industry faces competition for scarce AI talent. Data scientists with biotech knowledge are rare, and internal teams are often small. Many firms therefore explore partnerships or acquisitions of AI startups. For example, pharma companies collaborate with Big Tech (AWS, NVIDIA) for compute and models (www.mckinsey.com). Still, as the Pistoia survey reveals, companies see the talent gap widening – 34% of labs cite it as a barrier (www.pistoiaalliance.org). Upskilling thousands of traditional pharma staff, as discussed below, is a massive undertaking.
- **Regulatory Uncertainty:** AI introduces new regulatory questions. The FDA’s 2025 draft guidance on “considerations for AI in drug submissions” calls for strong AI model validation and context-of-use definition (www.fda.gov). The EMA and FDA have jointly issued high-level “Good AI Practice” principles (www.ema.europa.eu), and the EU is updating pharmaceutical legislation to explicitly encompass AI. These evolving rules mean that pharma companies must tread carefully: any AI system that informs

patient care or regulatory decisions must maintain traceability, bias mitigation, and possibly "human-in-the-loop" controls (pharmadispatch.com) (www.ema.europa.eu). For many firms, this means delaying full automation until models are validated, which can dampen short-term productivity gains.

- **Cultural and Organizational Resistance:** Perhaps the most insidious barrier is culture. Even when the tech works, employees may not trust or adopt it. ZS's analysis argues that organizations must treat agentic AI adoption as a change in behavior (www.zs.com). In pharma, where expertise is highly specialized and hierarchical, shifting to AI-assisted workflows can be jarring. If scientists or clinicians don't believe in an AI's output, they'll revert to old methods. If managers see AI as a threat rather than a collaborator, they may unconsciously hinder it. Changing this mindset is at the heart of AI change management.

Overall, while the AI technical tools – from ready-made models to cloud infrastructure – are expanding rapidly, **the organizational readiness in pharma is still catching up**. Many companies are in pilot stages, proving use cases, and experimenting with governance. Case studies below illustrate both successes and lessons learned from early adopters.

Workforce Upskilling and Change Management Strategies

Given these barriers, successful pharma AI adoption hinges on **strategic change management**: planning how the organization will learn and adapt, not just which tools to buy. This includes training and communication programs as well as aligning incentives and metrics. Leading consultancies emphasize that *"effective change management is critical,"* and that "the biggest obstacle… is getting people to actually adopt the [AI] solution" (catalant.com). We discuss below key elements of such strategies.

Building AI Literacy at Scale

Company-Led Training Programs

Recognizing the gap, many big pharma companies have launched ambitious internal upskilling programs:

- **Johnson & Johnson** has taken a **"bilingual" learning** approach. CIO Jim Swanson notes they treat AI competence as a core skill. J&J requires *all* employees to complete a mandatory generative-AI training (focused on prompt engineering, summarization, etc.) before using the technology. To date, **56,000** of J&J's 138,000 employees have finished this course (b17news.com). This massive scale reflects J&J's view that AI is no longer new; it's expected. They supplement it with a broader six-week "digital immersion" programme on AI and emerging technology, which more than 2,500 employees took in 2024, according to the March 2025 executive interview (Business Insider). Swanson explicitly says that creating a "curriculum and mindset around upskilling" was critical to avoid having leadership become AI "blockers" (b17news.com). By making training mandatory and by celebrating certifications earned, J&J is embedding AI literacy into its culture.

- **Merck (MSD)** similarly built an **enterprise AI platform** called GPTeal. This secure cloud portal gives employees access to ChatGPT, Llama, Claude, etc., while ensuring proprietary data remains safe (b17news.com). In a March 2025 interview, CTO Ron Kim reported that more than 50,000 employees regularly used GPTeal; this was an adoption figure, not a training-completion count (Business Insider). These training sessions cover practical workflows (e.g. drafting regulatory documents assisted by AI). Merck's CTO notes that now employees spend less time on low-level editing and more on "higher-impact tasks" (b17news.com). Regular platform use and participation in training are separate measures of readiness.
- **AstraZeneca** inaugurated a tiered **AI accreditation program** in 2024 for all U.S. and global staff (www.astrazeneca.com). Their program, rolled out with sponsors from IT, HR, and governance, provides *Bronze/Silver/Gold* certifications to employees as they master AI concepts and responsible use. In its 11 April 2025 disclosure, AstraZeneca reported that over 12,000 employees had participated (AstraZeneca). The program offers diverse learning methods (keynote talks, workshops, labs) and content in 12 languages, reflecting AZ's global scope (www.astrazeneca.com). The emphasis is on incremental upskilling at one's own pace, encouraging curiosity ("be curious, think critically, ask questions") and ethical awareness. By credentialing employees, AstraZeneca builds a visible incentive for engagement and creates a cohort of AI ambassadors inside the company.
- **Sanofi** has made AI "an expectation" rather than an optional project (pharmadispatch.com). Years ago Sanofi elevated digital issues to its top executive group and invested in data platforms and governance (pharmadispatch.com). Now, all leaders (and employees) must build AI competence. The country lead Liz Selby publicly noted that executives completed formal AI training so they would *not become blockers* (pharmadispatch.com). Additionally, Sanofi's RAISE framework (Responsible AI at Sanofi for Everyone) codifies principles (transparency, stewardship, oversight, etc.) to ensure ethics and compliance (pharmadispatch.com). Sanofi also uses hands-on workshops and "in-house generative platforms" (like an internal chatbot) to let teams practice AI. These measures put concrete momentum behind the rhetoric that "non-experts *can and should* use AI" (pharmadispatch.com).
- **Other Examples:** In September 2026, Novartis US said approximately 6,000 employees were expected to complete the initial level of its data and AI learning program by year-end (Novartis), and Eli Lilly has run company-wide workshops requiring managers to become "AI certified." AstraZeneca's Chief Digital Officer emphasizes that new hires can remain curious and opportunistic in AI use. The **Pistoia Alliance** also provides educational resources on applying AI/ML in the pharmaceutical industry (Pistoia Alliance). Moreover, leading academic programs (e.g., MIT Sloan's "AI in Pharma and Biotech" executive course (executive.mit.edu)) and professional conferences provide curated education for senior leaders.

Scaled and Peer-Learning Approaches

Apart from formal classes, companies are finding innovative ways to scale learning:

- **AI Ambassadors and Community Hubs:** Recognizing that employees trust peers, some firms appoint internal "AI champions." These can be volunteers or selected staff who have advanced training. They host small-group "lunch-and-learn" sessions, answer colleagues' questions informally, and share success stories. For example, AstraZeneca's credentialed program effectively creates such

ambassadors through its tiered scheme (www.astrazeneca.com). Similarly, the Catalant-Authored advice is to thaw resistance by *"deputizing enthusiasts as 'AI ambassadors' who work with peers… informally answering questions"* (catalant.com).

- **Learning in the Flow of Work:** The ZS report on agentic AI emphasizes integrating training into daily activities. It suggests aligning learning with real roles ("persona-centered training") and scheduling regular "AI rehearsals" where teams test AI suggestions collaboratively (www.zs.com). Merck's approach reflects this: their platform invites scientists to refine AI outputs (e.g. edit doc drafts) so that hands-on practice yields learning. These micro-habits (small, consistent AI tasks) help demystify AI and build confidence without lengthy time away from jobs.
- **University and Certification Partnerships:** Some companies supplement in-house training by sponsoring employees to take external courses or even degrees. Programs like Coursera's professional certificates or university diplomas in data science/AI are used. AstraZeneca cites global willingness to cross-educate; for instance, their Chief Data Officer Brian Dummann has spoken about collaborations with universities to prepare staff. The Pistoia Alliance's statistic that 45% of lab scientists *desire* formal AI courses (www.pistoiaalliance.org) indicates market demand for such partnerships.
- **Cultural Emphasis on Curiosity:** A soft but crucial aspect is **mindset**. As AstraZeneca puts it, they empower people to "remain curious" and own their development in AI (www.astrazeneca.com). At Sanofi and J&J the messaging is similar: AI is not feared but expected, with leadership modeling a "learn-by-doing" mentality. Public statements emphasize that AI skills are as fundamental as any other competency – a clear signal that training will be a priority and part of career advancement.

All these initiatives underscore how companies are **systematically embedding AI literacy**. The scale is impressive: tens of thousands of employees are already being trained across major pharmas in just the past 1–2 years (b17news.com) (www.astrazeneca.com). The goal is that, once frontline teams and decision-makers are fluent in AI concepts, the organization can move from isolated pilots to transforming entire processes.

Organizational Change Management

Training alone is insufficient without aligning organizational structures, incentives, and leadership behaviors. Key change management strategies include:

- **Vision and Strategy Alignment:** Executives must articulate a clear point-of-view on AI's role. McKinsey and others stress asking *why* (e.g. speed, novel science, cost-cutting) rather than forcing AI into existing processes (www.mckinsey.com) (www.pharmexec.com). Successful companies define specific goals (e.g. "reduce trial timelines by 30% in oncology research") and measure them (www.pharmexec.com). AbbVie, for example, reviewed *all stages* of R&D ("look at everything…we could start running fast" once infrastructure was in place) (www.mckinsey.com). This ability to "rethink the process" is crucial – companies must be willing to re-engineer workflows around AI, rather than retrofitting old ones (www.mckinsey.com).

- **Cross-Functional Governance:** Given pharma's regulatory environment, firms are involving compliance and legal *early*, framing them as partners. Catalant's Polin advises treating compliance not as a gatekeeper but as a collaborator that can set safe guardrails (catalant.com). Salesforce Life Sciences GM Frank Defesche concurs: when compliance/quality teams understand the technology, they serve as "tailwinds" rather than roadblocks (catalant.com). Many companies now have formal AI governance bodies (e.g. steering committees) that include legal, IT, R&D, and business leaders, to vet use cases and policies. Sanofi's RAISE framework is one such example of enterprise governance that covers transparency, human oversight, data stewardship, etc (pharmadispatch.com).
- **Dedicated Change Roles and Expertise:** Organizations are creating roles like "VP of AI Strategy", "AI Strategy Officers", and embedding AI specialists in business units. McKinsey notes that successful AI adoption relies on horizontal upskilling as well as specialized teams (www.mckinsey.com). Some companies appoint **Chief AI Officers** or hire consulting firms to bring change management capabilities. Catalant suggests bringing in seasoned change agents (internally or via consulting) specifically to navigate the people/process transition (catalant.com).
- **Communication and Engagement:** Regular communication is vital to align expectations and share successes. Monthly newsletters, intranet blogs, and open forums help demystify AI. AstraZeneca's leadership, for instance, regularly publishes stories of employees using AI (like improving workflow efficiency) to show tangible impact. J&J had their CIO speak at length about the "bilingual employee" vision (b17news.com), reinforcing a sense of collective mission. Transparency about failures (e.g. what didn't work in a pilot) is also encouraged to build trust; J&J and Sanofi report that they treat early AI missteps as "refinements" from which everyone learns (pharmadispatch.com) (b17news.com).
- **KPIs and Incentives:** Companies align incentives to reward AI usage. For R&D, this can mean tracking metrics like "proposals generated by AI tools" or "percentage of analyses assisted by ML models." In commercial areas, rep performance metrics may adapt to include use of AI-driven CRM tools. Crucially, organizations set **leadership KPIs** – C-level goals explicitly mention AI skills or outcomes. Sanofi's published responsible-AI approach emphasizes human accountability for AI-system outcomes (Sanofi). AstraZeneca's CIO Cindy Hoots frames AI education as "future-proofing" the workforce (www.astrazeneca.com), implying that those who embrace AI will be rewarded with career growth.
- **Personnel Change and Recruitment:** As internal upskilling takes place, companies also recruit specifically for AI competency gaps. New hires often come with data science or AI experience. GSK's Kim Branson described having both ML specialists and PhDs in imaging on the same team (www.mckinsey.com). The concept of "hybrid" roles is emerging: data scientists with pharma domain knowledge, or lab scientists with coding skills. Some firms consider strategic external hires or even partnering with AI startups to bring in talent. A *Change Management Consultant* is needed to coordinate all these elements – as Catalant notes, "not all organizations have the skill-sets they need to succeed" in AI change (catalant.com), so external expertise (or new internal teams) may be leveraged.

In sum, successful change management in pharma AI requires a **holistic approach**: blended learning programs, new governance processes, clear strategy, and ongoing support for employees. When these are in place, companies move from fearful debate about AI to confident usage. The Sanofi panel put it succinctly: in a

few years, we hope “we would not be talking about AI as much as we would be using it,” with leaders across the board being fluent and the technology “quietly embedded” in how value is created (pharmadispatch.com).

Case Studies: Building AI Literacy “From Lab to Boardroom”

To illustrate the themes above, we examine several real-world examples of pharma organizations actively managing this transition.

Sanofi: A “Digital Operating System” and RAISE Framework

At Sanofi, AI is treated as a **core business imperative**, not a secondary R&D project (pharmadispatch.com). At the November 2025 AI Health Summit, Sanofi leaders described AI as an expectation rather than a side project (pharmadispatch.com). Years ago, Sanofi had elevated digital transformation to its top executive agenda and invested in shared platforms, data lakes, and cloud infrastructure (pharmadispatch.com). Today, in internal forums the theme is that AI capabilities form part of the company’s “operating system” for how work gets done (pharmadispatch.com).

Concretely, Sanofi mandated that **every leader build personal AI competence** (pharmadispatch.com). The country head Liz Selby recounted that advocates (including herself) completed executive AI training to avoid becoming blockers. This top-down expectation complements bottom-up adoption of new tools: for example, Selby had each leader use the internal generative-AI platform (“Concierge”) to draft their personal development plans. The result was faster, higher-quality work and richer planning discussions (pharmadispatch.com). The philosophy is “learning by doing” – every senior manager is expected to be proficient in prompt design and model use.

In R&D, Sanofi employs analytics to drastically shorten processes. Medical Affairs now uses AI to draft reports, shape strategy, and integrate medical insights in hours instead of weeks (pharmadispatch.com). A tangible goal – reducing clinical study report prep times to one-third of today’s cycle – has been set, aided by analytics on patient EHR data for targeted trial recruitment (pharmadispatch.com). These successes (e.g. identifying rare-disease patients via AI) are shared across the company to build enthusiasm. Importantly, Sanofi emphasizes that none of this “just happened” – usage grew *because* tools improved and leadership invested in hands-on workshops (pharmadispatch.com).

Governance and ethics are embedded via Sanofi’s **RAISE framework** (“Responsible AI at Sanofi for Everyone”) (pharmadispatch.com). This publicly-stated policy covers transparency, dataset stewardship, human oversight, and environmental impact. It signals that all AI projects must meet these standards *from the start*. Leadership acknowledges that mistakes in AI ethics are not easily fixed later (pharmadispatch.com). Sanofi’s culture is therefore one of cautious innovation: teams innovate aggressively, but with built-in checkpoints. Failures are viewed as “course corrections” rather than catastrophes (pharmadispatch.com).

Finally, at the board/executive level Sanofi's leadership openly commits to normalization of AI in daily work (pharmadispatch.com). All employees, including those in corporate affairs, are encouraged to use AI (e.g. for drafting briefs) – with the caveat that humans maintain oversight on high-stakes outputs (pharmadispatch.com). In an aspirational 3-year outlook, Sanofi's panel hoped that AI would become *so commonplace* that one wouldn't even talk about it – it would simply be part of every role (pharmadispatch.com). The lesson from Sanofi's example is clear: when executives themselves are fluent and have "skin in the game," they set a standard that permeates the organization.

Johnson & Johnson: The "Bilingual" Workforce

Johnson & Johnson's approach turns its entire workforce into "bilingual" employees – fluent in both their domain (science, manufacturing, sales, etc.) and AI. The J&J CIO, Jim Swanson, describes how he and other leaders made AI training mandatory to spread this culture (b17news.com). J&J CIO Jim Swanson has said that employees apply learning from the company's digital upskilling program on the job (Swanson's comment). The course covers practical skills like crafting prompts for large language models and using summarization tools. Completion is enforced before any employee can use the company's approved AI tools internally. A second "digital dive" bootcamp (covering AR, AI, automation) has logged 37,000 training hours by 14,000 employees as of 2025 (b17news.com).

Importantly, J&J links this training to career development: employees who master AI tools are positioned as innovators within their teams. The company also emphasizes efficiency gains: workers learn how AI can save time on routine tasks, freeing them for creative problem-solving. In short, J&J leverages large-scale mandatory training plus *cultural messaging* ("bilingual employees") to lift overall literacy.

Merck: An Integrated AI Platform (GPTeal) and Community Support

Merck's strategy was to build a **shared AI environment** for all scientists and staff. The GPTeal platform acts like a "pharma ChatGPT" – employees can safely query it with both company data and public LLMs (b17news.com). Crucially, GPTeal is not left unused: Merck invested heavily in training around it. In the March 2025 interview, Merck CTO Ron Kim reported more than 50,000 regular GPTeal users (Business Insider). The training was self-service (online modules), supplemented by monthly "office hours" webinars on GenAI and coding bootcamps for developers.

Merck's CTO emphasizes measuring the AI impact: a formal process is in place to identify which AI use cases ("demos") yield dramatic impact on business. They focus on high-value opportunities such as automating document drafting in regulatory filings (where scientists were historically slogging through repetitive edits) (b17news.com). By teaching employees that GPTeal exists and how to use it, Merck created a strong adoption chain: managers supported usage by small group projects, and analysts shared success stories. The result is that generative AI is now used routinely across functions (even marketing and HR), with oversight by a cross-functional steering group; many Merck leaders report AI freeing up staff for more creative work.

AstraZeneca: Tiered Accreditation and Global Learning Pathways

AstraZeneca's "AI Accelerator" program (launched 2024) exemplifies a **structured, gamified upskilling path**. It is sponsored by multiple C-suite members and open to all employees worldwide. The program offers a tiered certification scheme: participants earn Bronze, Silver, Gold (and higher) badges as they complete modules on technology, ethics, and business use-cases (www.astrazeneca.com). In its 11 April 2025 disclosure, AstraZeneca reported **over 12,000** employee participants (AstraZeneca). AZ emphasizes *"learning by doing":* virtual lab sessions, simulated projects, and real-time problem-solving workshops are all part of the curriculum (www.astrazeneca.com).

AstraZeneca's senior leaders frame this as future-proofing their workforce. C-level quotes highlight their belief that "AI we know today is the least capable it will ever be" and that empowering employees "to harness AI ethically and at scale" will yield "faster insights, smarter trials, and medicines that reach patients sooner" (www.astrazeneca.com). In other words, AZ is instilling a growth mindset: it isn't enough to train once, because AI itself is evolving rapidly (www.astrazeneca.com). Just like a medical student continuing education, AZ employees must keep learning.

AstraZeneca describes its development programs as combining formal training with practical experience (AstraZeneca).

Implementation Insights from the Field

These cases reveal several **best practices** in pharma AI change management:

- **Executive Sponsorship is Crucial:** In each case, senior leaders (CIOs, CTOs, CDOs) actively championed the programs and even took training themselves (pharmadispatch.com) (b17news.com). This top-down buy-in sends a clear message that AI literacy is a strategic priority.
- **Skills Development for All Levels:** Programs are comprehensive, from basic awareness modules for non-technical staff up to specialized tracks for data scientists. Tiered learning accommodates different starting points (much as AZ's Bronze→Gold scheme).
- **Integration of Learning and Work:** Training is not just theoretical. Employees practice with real tools and tasks (J&J's prompt-engineering drills, Merck's real-doc editing with GPT, AstraZeneca's lab simulations). This "learning through doing" increases retention and relevance.
- **Metrics and Progress Tracking:** All companies track participation and proficiency. Setting numeric goals (e.g. J&J's 56K trained) and celebrating milestones creates momentum. Some even link it to business KPIs (e.g. AZ tying outcomes to pipeline acceleration).
- **Building Communities:** Many mentioned the importance of peer networks. For instance, AZ created a "learning community" across languages (www.astrazeneca.com), and Merck hosts online forums around GPTeal. This social aspect helps diffusion.
- **Addressing Fear and Ethics Heads-On:** Programs consistently include modules on AI ethics and regulatory compliance (e.g. AstraZeneca stresses ethical use, Sanofi's RAISE, Merck's supervised models). Leaders explicitly acknowledge employees' concerns about data privacy and job impact, and provide guidance to manage them.

In essence, these companies are creating an **AI-capable workforce pipeline** from the ground up, while simultaneously updating corporate policies and metrics to sustain adoption. Their successes so far – significant training completion numbers and early productivity gains – demonstrate that systematic change management can bridge the AI skills gap.

Data-Driven Evidence and Analysis

Throughout the above discussion, we have integrated evidence from surveys, expert interviews, and case reports. Here we summarize key quantitative findings and trends:

- **Expansion Metrics:** Surveys show 70–86% of life-science leaders are adopting or planning to adopt AI imminently (www.axios.com) (www.fiercepharma.com). 75% of firms report AI implementation in the past two years (www.axios.com). 80%+ increased AI budgets (www.fiercepharma.com). Investments in AI are high: global spending exceeded $250B in 2024 (www.mckinsey.com), with pharma projected to reach ~$25B by 2030 (www.mckinsey.com).
- **Skills Gap:** In lab R&D, the Pistoia survey documents a jump to 34% (from 23%) of labs citing “lack of people” as a barrier to AI (www.pistoiaalliance.org). 45% of lab respondents explicitly want AI/ML courses, and 51% want guidance resources (www.pistoiaalliance.org). The Pistoia Alliance provides educational resources focused on pharmaceutical AI/ML applications (Pistoia Alliance).
- **Training Outcomes:** While hard to measure directly, companies report training uptake. Examples cited include 56,000 J&J staff trained (b17news.com), Merck’s training in prompt engineering and data pipelines for its clinical-study-report platform, reported in June 2025 (Merck), over 12,000 AstraZeneca employee participants reported on 11 April 2025 (AstraZeneca). These scale metrics demonstrate a significant organizational commitment. In some cases, increased efficiency is measurable: e.g. Sanofi anticipates trimming clinical report time to 1/3 and making targeted recruiting faster (pharmadispatch.com). Aizon’s case study reports that, within three months of implementation, Recordati increased yield by 1.5% and reduced cost of goods sold by 2% (Aizon). While more systematic ROI data is emerging, early signs (like doubled tagging productivity (catalant.com)) are encouraging.
- **Leadership and Culture:** Anecdotal evidence suggests a change in mindset. Analyst surveys from ZS and others find that when employees participate in AI initiatives, trust and comfort grow, but also reveal psychological barriers (unrest about AI roles (www.zs.com)). Companies are using those insights: e.g. structured feedback loops and transparency to build trust (www.zs.com). Quantitatively, the majority of change efforts in general (not pharma-specific) have historically failed (~60–70%) (catalant.com) without deliberate management – underscoring why pharma must pay attention.

Overall, the **evidence base** – from published surveys, company disclosures, and white papers – shows rapidly rising AI engagement across pharma, tempered by tangible organizational challenges. Our arguments and recommendations are rooted in this data: for instance, the cited Pistoia figures on skills bottlenecks directly

support the need for the training programs we describe. By triangulating sources like business news, industry consortia reports, and expert blog analyses (e.g. (eularis.com) (www.pistoiaalliance.org)), we build a comprehensive, data-driven picture of the transformation underway.

Future Implications and Outlook

Short-Term (1–3 Years)

In the near term, we expect these trends to accelerate:

- **Widespread AI Adoption:** As generative AI tools become more reliable and user-friendly, even non-technical pharma employees will incorporate them into routine tasks (document drafting, data lookup, basic analytics). Shadow AI (unauthorized use) is likely to persist unless governance is strong, but on-balance the trajectory is toward integration. By 2028, it is plausible that many of today's "experiments" (like trial design optimization) will reach some regulatory maturity, provided foundational work on validation and explainability is done (pharmadispatch.com) (www.ema.europa.eu).
- **Evolving Roles and Skills:** Job roles will continue to evolve. Biologists and clinicians will increasingly need data fluency (e.g. interpreting AI model outputs). Data scientists in pharma will be expected to have domain knowledge. New hybrid roles – "Machine Learning Engineers" embedded in disease-area teams – will become common. Some propose even an "AI ethicist" on safety boards. As the head of J&J's data office put it, "you need people who are *trilingual*: versed in science, data, and strategy" (www.mckinsey.com).
- **Regulatory Integration:** Regulatory agencies themselves are moving fast: the FDA draft (2025) on model credibility, and the EMA/FDA joint principles (2026) show that within a few years there will be established guidelines for how AI must be documented and validated in submissions (www.fda.gov) (www.ema.europa.eu). Pharma companies will need to institutionalize those practices (e.g. reproducibility checks, bias audits) as part of training literate staff in compliance.
- **Ethical and Social Considerations:** With wearable devices and personalized medicine, patient data will flow more into AI systems. Papers warn that **transparency and privacy** could affect patient trust (pharmadispatch.com). In a possible future, patients might opt in to share device data for AI insights, but this will require clear communication and consent—another form of literacy (patients as well as providers will need education about how AI is used with their data).
- **Economic Pressures:** Competitive pressure will only grow. One possible scenario is that smaller biotechs using AI generate discoveries faster, pushing larger pharmaceutical companies to scale their efforts. At the same time, AI could lower early discovery costs, which might benefit big companies through higher success rates (moneyweek.com). In either case, shareholders and investors will demand that pharma companies not be left behind, so the C-suite will likely continue to prioritize AI literacy. We may see AI-related metrics included in quarterly reports or board presentations (e.g. number of AI trials completed, percentage of projects with AI components).

Long-Term (Beyond 2028)

Looking further ahead, profound changes are conceivable:

- **Embedded AI Culture:** The hope expressed by Sanofi's leaders – "we should not still be talking about AI, but simply *using* it" (pharmadispatch.com) – reflects the vision of an organization where AI is completely integrated. In 5–10 years, successful pharma companies might not have separate "digital" departments; instead, all R&D, manufacturing, and commercial processes will be digitally native, with AI tools as standard equipment (like PCR machines or HPLC analyzers are today).
- **Human-in-the-Loop Paradigms:** Many experts argue that the future is not AI *replacing* humans, but *pairing* with them in a hybrid model (eularis.com). We will likely see work designs where robots/AI handle routine analysis, while humans focus on designing experiments, interpreting subtle patterns, and ethical oversight. Formation Bio's CEO describes his aim as creating a better pharmaceutical company (TIME interview). If such models scale, pharma business models could revolutionize (fewer large headcounts, more value on data and AI assets).
- **Continuous Learning:** AI languages and frameworks evolve rapidly. The organizations that prosper will treat learning itself as a continuous process. Pharmaceutical companies may establish permanent partnerships with universities and AI firms, rotating personnel between academia and industry for ongoing training. Consortiums like Pistoia's expansion of training programs (www.pistoiaalliance.org) hint at this future.
- **Ethical Standardization:** Over time, we expect international standards analogous to Good Clinical Practice (GCP) to emerge for AI (some already being drafted). Pharma boards will routinely review AI governance alongside safety and quality. AI ethics will become integrated into corporate compliance frameworks, and industry-wide codes (like GAMP for automation) may be developed specifically for AI in drug development.
- **Patient-Centered AI:** On the ground level, AI literacy will extend beyond employees to patients and healthcare providers. Companies might run public education campaigns so that end-users (patients, doctors) understand how AI-enhanced drugs or devices work. An "AI-literate patient" may become a regulatory consideration (e.g. designing patient-facing apps that use AI).

Overall, the future of pharma appears to be one where data and AI are as fundamental to innovation as chemistry was a century ago. However, only those organizations that manage the human transition – building broad literacy and adaptable cultures – will capture the full promise. As one panelist put it, leadership in pharma must "show up, set the standard, and be accountable" for AI outcomes (pharmadispatch.com). The necessary ingredients are in sight: motivation, budgets, and early successes. The recipe for survival and success is now clear: **develop the people and processes that can feed, trust, and properly govern the AI engines of progress**.

Conclusion

Adopting AI in the pharmaceutical industry is not merely a technological upgrade but a deep organizational transformation. Our research shows that while AI has potential to accelerate discovery, streamline trials, and improve efficiency, these gains will not materialize automatically. The most critical factor is **people** – their skills, mindsets, and behaviors. The industry is well into a "pilot" phase now; the companies that transition to "production" phase of AI will be those that invest heavily in change management and literacy.

Key conclusions and recommendations include:

- **Invest in Education and Training:** R&D scientists, clinicians, quality engineers, and all staff need training in AI fundamentals, data literacy, and even the use of specific tools. This training must be mandatory and measured (as seen at J&J, Merck, AZ). Senior leaders must lead by example by participating in training and championing AI initiatives (pharmadispatch.com) (b17news.com).
- **Embed AI in Strategy and Governance:** AI projects should be aligned with clear business goals, sponsored by top management, and governed by multi-disciplinary committees. Legal and compliance teams should be involved from the start to ensure responsible use (catalant.com). Frameworks for ethics (like Sanofi's RAISE or the EMA's principles (pharmadispatch.com) (www.ema.europa.eu)) should be codified company-wide.
- **Cultivate an Adaptive Culture:** Companies must transition from cautious pilots to an agile, experimental mindset (build, test, learn, refine). Sharing of best practices, celebrating small wins, and normalizing failure-as-learning (as Sanofi's leaders emphasize) help overcome cultural resistance (pharmadispatch.com) (www.pharmexec.com). Ambassadors and peer networks can accelerate acceptance.
- **Focus on Data Foundations:** Without high-quality, FAIR data, AI cannot deliver. Firms should expedite digital integration (lab notebooks, ERP, EHRs) and ensure data engineers and stewards are on staff. Data and AI literacy go hand-in-hand; leaders must enforce data management as a strategic priority (www.pharmexec.com) (www.mckinsey.com).
- **Measure and Iterate:** Set clear metrics for AI adoption (percentage of processes digitized, user adoption rates, time saved, etc.) and review them. Survey employee comfort and skills periodically, and adapt training accordingly. The recent Pistoia data suggests that keeping a pulse on skills needs enables companies to tailor programs quickly (www.pistoiaalliance.org).
- **Collaborate With the Ecosystem:** No company can do this alone. Join consortia (e.g. Pistoia Alliance, industry AI forums) and engage with regulators early. Share anonymized data and best practices to help establish industry standards. The FDA has piloted AI-assisted scientific review internally (FDA). Companies should engage with regulators and industry groups when developing responsible adoption practices.

In sum, building AI literacy from the lab bench to the boardroom is a strategic imperative for pharma. It touches every function and level of the organization. The depth of change is comparable to the shift from mechanistic chemistry to biotechnology decades ago. Those firms that treat it as an "industrial revolution" and proactively

train and align their people will gain competitive advantage, whereas those that hope AI alone will solve their problems risk wasted investment and missed opportunities (pharmadispatch.com) (eularis.com). The evidence and case studies all point to the same conclusion: **empowering people** is the essential step toward unlocking AI's transformative power in medicine.

Ultimately, a pharma industry that succeeds in this change will not just be one where AI tools exist, but one where **every scientist, every clinician, and every executive understands and effectively uses AI** – where decisions are consistently informed by intelligent data analysis, and where innovation thrives because human expertise is amplified rather than replaced. This vision can be realized, but only through concerted, strategic effort to manage the human side of AI adoption.

References: All claims and data above are backed by industry reports, scientific literature, and news sources. Sources are linked inline using descriptive labels or domain names. Key references include industry surveys (e.g. Arnold & Porter, FiercePharma, Pistoia Alliance), expert analyses (McKinsey, ZS, Catalant, PharmExec), corporate announcements (Sanofi, AstraZeneca media releases), and academic reviews (www.axios.com) (www.pistoiaalliance.org) (pharmadispatch.com) (www.astrazeneca.com). These citations provide an evidence base for the trends and recommendations discussed.

Source links

Links cited in this article, in order of first appearance. Full addresses are provided for readers using extracted text.

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