Build vs. Buy: Weighing Pharma's AI Strategy Tradeoffs

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The pharmaceutical industry is investing heavily in artificial intelligence, but leaders face a fundamental strategic dilemma: should AI models be developed internally or sourced from external providers? It's a familiar build-or-buy question that has taken on new urgency as AI promises to transform drug discovery, clinical operations, and commercial strategy. In 2025, over 85% of pharma companies report increasing their AI investments despite budget pressures (1). Yet how they pursue these AI ambitions varies widely – some favor building in-house capabilities, others lean on third-party platforms, and many foresee a combination of both. This article examines the strategic, technical, and business tradeoffs of developing AI models internally versus relying on external partners. It explores the pros and cons of each approach, provides illustrative examples, and concludes with why a hybrid approach is emerging as the likely path forward.

Pharma's AI Dilemma: In-House Development vs. External Partners

Pharmaceutical companies have traditionally preferred an "ownership" mentality – building technology internally to maintain control. As one pharma leader put it, "everything to date was internal… we want to do most of this in-house," reflecting a deep-rooted skepticism toward black-box vendor solutions. This tendency made sense when off-the-shelf AI tools lacked pharma-specific capabilities. However, the landscape is shifting. According to recent industry surveys, only about 30% of pharma leaders now plan to stay fully in-house, while 40% expect to take a hybrid approach and 30% are leaning toward external-first strategies (2). In other words, a majority are open to partnering externally in some form. This shift "reflects a growing recognition that internal teams alone may not be able to move fast enough or capture the full value AI offers," as one report noted (1).

Current State: Many organizations are already blending approaches. One analysis found roughly 43% of pharma AI projects are developed internally, with the rest leveraging external solutions or partnerships (3). Even the highest-performing companies combine both: nearly 90% of AI leaders utilize internal development, and two-thirds also collaborate with outside partners to fill gaps in expertise or accelerate results. Clearly, there is no one-size-fits-all answer. Each approach brings distinct advantages and challenges, which we unpack below from strategic, technical, and business perspectives.

Developing AI In-House: Control and Customization at a Cost

Building AI models internally gives pharma companies full control over their data, technology, and intellectual property. Firms can architect solutions precisely to their needs and integrate them seamlessly with existing systems, potentially creating unique capabilities that confer competitive advantage. Internal development keeps sensitive data in-house, which appeals in a highly regulated industry concerned with patient privacy and trade secrets. Strategically, owning the AI stack can differentiate a company - the solution and insights are proprietary rather than available to competitors. For example, some pharma organizations have established internal AI centers of excellence and research labs, aiming to harness their proprietary data to discover new drug targets or optimize trials in ways that outsiders cannot replicate.

However, the in-house route comes with significant costs and risks. Developing a custom AI platform from scratch is *extremely expensive*, requiring substantial upfront investment and ongoing maintenance budgets. Companies must hire and retain top AI talent who also understand life sciences – a rare and competitive skill set. In fact, lack of in-house AI expertise is cited as a major barrier by over half of pharma executives. Even with talent on board, internal teams face the challenge of keeping pace with a rapidly evolving AI field. There is a continuous need to update models, adopt new techniques, and maintain cutting-edge infrastructure, which can strain resources. As a result, purely in-house AI efforts may progress slowly, delaying time-to-value. Large pharma companies can find it hard to secure buy-in for big, uncertain AI initiatives, especially if early results are not guaranteed.

Regulatory compliance is another in-house headache. Healthcare AI must meet stringent regulations (from data integrity to algorithm transparency), and internal teams shoulder the burden of monitoring evolving guidelines and ensuring the AI system remains compliant. This overhead can divert focus from innovation to paperwork. In short, while building internally maximizes control and customization, the approach demands heavy investment, specialized talent, longer timelines, and diligent compliance and maintenance efforts. Only organizations with strong commitment, resources, and patience tend to succeed with a fully in-house strategy. Many pharma companies have discovered that these hurdles make an exclusively internal approach difficult to scale.

Leveraging External AI Providers: Speed and Expertise with Tradeoffs

Given the challenges of doing everything internally, pharma companies often consider external AI solutions – ranging from off-the-shelf platforms (such as generic AI tools or cloud AI services) to specialized vendors and startup partnerships. Relying on external providers can offer faster implementation and lower upfront

cost. Instead of reinventing the wheel, teams can license or subscribe to existing AI tools that are ready to deploy, gaining instant capabilities without years of development. This agility is valuable in a competitive environment; an external solution can be piloted and delivering value in months rather than the multiyear timeline of a ground-up build. Moreover, external AI vendors bring deep technical expertise that may be hard to assemble internally. Providers focused on life sciences have AI engineers, data scientists, and domain experts on staff, allowing pharma clients to tap into cutting-edge skills and innovations without hiring a full team themselves. As one industry expert observed, no single pharma company has all the data or computing power to do AI entirely alone — partnering with outside models and infrastructure is often necessary to realize AI's full potential (2).

> **Illustrative example:** A pharmaceutical CIO recently piloted a well-known external AI productivity tool (Microsoft's Office 365 Copilot) but ended up cancelling the contract after finding the results underwhelming for the cost (4). The generic AI could produce flashy slides and text, but the content quality was likened to "middle school presentations," which did not justify paying nearly double the software license fees. This case highlights a broader point: not all external AI solutions are mature enough to meet pharma's high standards. Basic off-the-shelf models might work for general tasks, but they often falter on specialized pharmaceutical use cases.

The downsides of external AI fall into a few categories. First, many generic AI tools lack the domain-specific training and context needed for life sciences. They may misunderstand medical terminology or nuances — for instance, interpreting a "negative" test result as bad when in a medical context negative can mean a desired outcome (no disease). Such models risk hallucinations or incorrect outputs if they haven't been rigorously trained on biomedical data. Using them "out of the box" can lead to errors that have real consequences for patient safety or R&D decisions. Some pharma companies that eagerly adopted general-purpose AI are now *pulling back* after seeing these limitations. Secondly, data security and compliance concerns are paramount. Sending proprietary data to an external provider or cloud system raises the stakes on privacy and IP protection. Many generic AI SaaS products do not yet meet the stringent security and regulatory requirements of pharma. Companies must vet vendors thoroughly; if a tool cannot guarantee data isolation and compliance with healthcare regulations, using it is risky. Even when vendors claim to be secure, pharma IT teams often remain wary of "black box" solutions where they lack visibility into how the model works or how data is handled. Trust is a major hurdle — as one pharma exec said about external AI, "if it's a black box, it's hard to trust".

There are also business and strategic tradeoffs. An external solution that any competitor can buy offers less competitive differentiation. Over-reliance on vendors might lead to dependency or loss of internal capabilities in the long run. Integration with internal workflows can be challenging, too - if an external platform doesn't mesh with a company's data systems and processes, it can create friction. In fact, pharma leaders report that the toughest part of adopting external AI is often *integration*, not the AI's raw performance.

Without careful change management, even a technically sound external tool may not scale across an organization due to user resistance or IT integration issues.

That said, external partnerships continue to mature and adapt to pharma's needs. A new breed of specialized AI vendors offers "bespoke" life sciences solutions that combine the customization of in-house development with the convenience of off-the-shelf tools. These platforms come pre-trained on biomedical literature, clinical data, and domain ontologies, making them far more accurate for pharma use cases than generic models. They also provide secure, validated environments where sensitive data can be analyzed with full compliance, relieving the company of having to manage all regulatory aspects alone. In essence, such solutions deliver industry-specific AI capabilities quickly, while tailoring to each pharma client's needs and adhering to privacy standards. The vendor shoulders the burden of keeping the technology up-to-date and compliant, and the pharma company benefits from continuous improvements and expert support. This illustrates how working with external providers can be not just a stopgap, but a strategic choice to leverage outside innovation and scale AI initiatives faster.

Side-by-Side Summary: In-House vs. External AI Approaches

To summarize the tradeoffs, the table below compares key factors when developing AI in-house versus using external AI providers in pharma. Each approach has strengths and weaknesses across strategic, technical, and operational dimensions:

Factor	In-House Development	External Solutions
Control & IP	Full control of data, IP, and system design; solutions can be uniquely tailored, potentially yielding a competitive edge.	Relinquishes some control; data may be shared outside. Skepticism remains about "black-box" vendor models that lack transparency.
Cost & Investment	Requires significant upfront investment and ongoing maintenance budgets. Must hire specialized talent and build infrastructure internally.	Lower upfront cost – often subscription or usage-based. Provider handles development and upgrades. However, subscription fees can add up, and high licensing costs may not always equate to high value.
Time to Value	Longer development timelines (building from scratch can take years). Initial ROI may be delayed until models mature.	Faster implementation and iteration using ready-made tools. Quick to pilot; can demonstrate value in months if the solution fits the use case. Accelerates AI adoption and scaling.

Factor	In-House Development	External Solutions
Expertise & Talent	Must recruit and retain scarce AI + domain experts in-house. Internal team needs to stay current with rapid AI advances. Skills gaps can slow progress.	Leverages vendor's specialized expertise and R&D. Access to top AI talent via the provider. Also helps address internal skill gaps by having consultants or external experts guide and upskill staff.
Customization & Fit	Solution is built to the company's exact needs and processes, ensuring a tight fit and integration with existing systems. Ideal for proprietary data and unique use cases.	Generic tools may not handle pharma-specific terminology or nuances, leading to errors or "hallucinations" in outputs. Specialized vendors mitigate this by offering industry-tuned models, but off-the-shelf options can require significant tuning to fit.
Compliance & Security	Company maintains full data custody, reducing external privacy risk. However, internal teams must ensure ongoing compliance with regulations (a complex, resource-intensive task).	Reputable vendors provide secure, validated environments and take on compliance burdens. Still, due diligence is needed: not all tools meet pharma's stringent security requirements. Data sharing with partners requires robust safeguards and contracts.
Scalability & Support	Scalability depends on internal resources. Ongoing support and model improvements rely on internal team capacity. Could become outdated if the team can't keep up with AI innovations.	Vendors often offer scalable cloud infrastructure on demand and continuous model enhancements. Support and maintenance are part of the service. Integration at enterprise scale can be challenging, but external experts can help navigate deployment across the organization.
Competitive Advantage	Proprietary AI systems can become a source of sustained competitive advantage if they are truly novel and effective. Competitors cannot easily replicate an internal solution that is built on unique data and insights.	Widely used third-party solutions offer less differentiation (competitors could implement similar tools). The advantage comes from *how* you use the tool (e.g. superior data or processes), not from the tool itself. However, partnering with cutting-edge AI startups early could give a temporary edge.

Towards a Hybrid Approach: Blending Internal and External Strengths

In practice, pharma companies are increasingly finding that the optimal AI strategy is a hybrid one – combining internal development with external partnerships. A hybrid approach aims to capture the best of both worlds: the domain-specific knowledge, control, and proprietary assets of in-house development, plus the speed, innovation, and specialized capabilities of external providers. Rather than viewing it as an either/or choice, forward-looking organizations treat external AI tools as extensions of their team and a source of acceleration for their AI agenda.

Why is a hybrid model likely? First, internal teams often "can't move fast enough or capture the full breadth of AI's value alone", as experts note. By bringing in outside expertise — whether through consulting partnerships, collaborations with AI startups, or using cloud-based AI services — pharma companies can significantly speed up development and deployment. For example, a company might use a proven foundation model from a tech partner or open-source community as a starting point, and then have its in-house scientists fine-tune that model on proprietary clinical data. This way, the heavy lifting of building the core AI engine is outsourced, but the final solution is still adapted to the company's unique data to create differentiated value. Dan Sheeran, General Manager of Healthcare & Life Sciences at AWS, observed that no single pharma has all the data or computing power needed in isolation, and "the real traction today is with hybrid models" that start with external models and layer internal data/expertise on top (6).

Secondly, a hybrid approach addresses the talent and knowledge gap. Pharma firms can upskill their workforce by working alongside AI technology partners. Many are adopting a model where a core internal team works with external experts in a "co-development" fashion. This not only helps deliver projects faster but also transfers knowledge to internal staff. As an executive from a global pharma staffing firm noted, companies are moving toward a model where a certain percentage of the AI workforce is internal and a certain percentage is external — "every one of our large global pharma clients... has to be a mix of both, a balance". Such a balance ensures the company builds internal capability over time (so it isn't completely vendor-dependent), while still leveraging outside help to fill immediate gaps.

There are also strategic reasons for a blended approach. AI in pharma spans a wide range of applications – from research (e.g. molecule design, target identification) to clinical trial optimization, supply chain forecasting, and commercial analytics. It's unlikely one organization will have equal strengths in all these areas. A sensible strategy is to build in-house AI for core areas that align with a company's unique competitive advantage or rich proprietary data, and outsource or partner in other areas where external experts have proven solutions. For instance, a pharma might internally develop AI models for its proprietary chemistry data (to directly drive new IP in drug discovery), but use an external AI platform for something like pharmacovigilance text mining or HR analytics, where vendors already have robust offerings. By picking battles, companies focus their scarce

internal talent on what matters most, and avoid reinventing the wheel for non-core capabilities.

Finally, the hybrid model is favored because the AI vendor ecosystem has matured**.** Pharma companies now have access to a "maturing ecosystem of consultants, vendors, and industry partners" who understand life sciences and can collaborate effectively. Early in the AI wave, many pharma engagements were with academia or unproven startups, which carried high risk. Today, there are established players and platforms that have demonstrated value in pharma settings. This makes executives more comfortable splitting the work. Leaders in AI adoption tend to maintain a network of partners while also growing their internal center of excellence — they leverage external solutions to accelerate *and* ensure internal teams learn and govern the AI strategically.

Emergence of Domain-Specific AI Platforms: The Example of Anthropic's "Claude for Life Sciences"

A recent development underscores just how far external AI providers have advanced. In late 2025, Anthropic launched *Claude for Life Sciences* — a version of its foundation model optimized for biomedical R&D workflows (5). Unlike general-purpose AI tools, Claude for Life Sciences integrates directly with research environments such as Benchling, Synapse.org, and 10x Genomics Cloud, and has been benchmarked to perform at or above human-level accuracy in interpreting laboratory protocols and biomedical text.

This marks a shift in the "buy" landscape. External AI solutions are no longer limited to productivity tasks or surface analytics; they now reach into scientific reasoning, experiment design, and regulatory documentation — areas once considered out of scope for generic models. In effect, domain-tuned platforms like Claude for Life Sciences blur the boundary between internal R&D systems and external AI services.

For pharmaceutical companies, this evolution changes the strategic calculus. The choice is no longer between black-box generalist models and slow internal builds. Instead, leaders can now access external AI that is *purpose-built* for their industry — offering both speed and domain specificity. This creates new opportunities to "buy smarter," selectively integrating such tools for data-heavy or knowledge-intense workflows (e.g., literature mining, target validation, or preclinical documentation), while reserving in-house AI for proprietary use cases tied to unique company data or IP.

At the same time, these new platforms raise familiar concerns around data governance and dependency. Companies must still ensure that externally hosted models comply with internal security, privacy, and regulatory frameworks — especially when models have the ability to ingest or reason over proprietary data. The emergence of life-science-specific foundation models like Claude for Life Sciences therefore reinforces a broader trend: the external AI market is maturing rapidly, but prudent pharma organizations will

blend external adoption with internal governance and custom development to retain control over critical IP and insight generation.

Conclusion: From Dilemma to Design Choice

For most pharma and life sciences organizations, the “build vs. buy” debate is no longer a binary decision but a design question: what do we build, what do we buy, and how do we govern the interface between both? Building AI models internally offers unmatched alignment with proprietary data and scientific intent, yet is resource-intensive and slow. Relying on external AI accelerates adoption but raises questions of dependency, data governance, and long-term differentiation.

A hybrid approach — developing critical IP-related models in-house while leveraging domain-tuned external platforms for speed and scale — has emerged as the pragmatic middle path. The rise of purpose-built AI tools such as Anthropic’s Claude for Life Sciences demonstrates how “buy” options are becoming more sophisticated, reducing the gap between external convenience and internal scientific depth.

Ultimately, success will depend not only on technical excellence but on strategic orchestration: aligning talent, governance, and data ownership in a way that lets AI augment — rather than outsource organizational intelligence.

Strategic Questions Ahead

As hybrid AI models evolve from experiments to enterprise infrastructure, several unresolved questions deserve closer attention:

- Governance implications: Who owns the model’s decisions, risks, and regulatory accountability when internal and external AI layers intertwine?
- Long-term capability: How can “temporary” vendor partnerships evolve into embedded ecosystems that strengthen, not substitute, internal know-how?
- Competitive leakage: As vendors train on aggregated client data, how can pharma ensure that insights derived from its assets do not diffuse into the market?
- Transparency & ethics: What governance structures will ensure explainability, auditability, and fairness across distributed AI ecosystems?

These questions move the discussion beyond build vs. buy — toward designing a trusted and resilient AI operating model for the life sciences.

Crowlight Perspective

At Crowlight Partners, we view these not as theoretical puzzles but as strategic design challenges that determine how pharma captures long-term value from AI. Our work focuses on helping leadership teams define:

- which AI capabilities to own,
- where to partner or license, and
- how to structure governance frameworks that safeguard data integrity, IP, and compliance while enabling innovation.

If your organization is navigating these decisions, we would welcome a dialogue on how to turn AI strategy into measurable business and patient impact.

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