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"R&D and clinical development are likely to see the most significant AI-driven transformation over the next three to five years"

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AI is moving from experimentation to measurable impact across the life sciences value chain. As pharma and healthcare organisations move beyond AI pilots, the focus is increasingly shifting from where can AI be deployed; to where is it actually improving outcomes, accelerating decisions and changing how work gets done. During a detailed interaction with BioSpectrum, Karan Dhundia, Regional Managing Principal, ZS shares his perspective.



Where is AI delivering the most quantifiable ROI in pharma and biotech today and why are so many pilots failing to scale?

The clearest returns we are seeing today come from two areas: commercial functions and enterprise technology and data operations. AI has moved from promise to proof. In ZS's 2027 CDIO Outlook, 70% of technology leaders report measurable value in enterprise IT, and 56% report it in commercial sales and marketing, from HCP engagement to personalisation. Companies are putting AI to work to improve productivity, make engagement more relevant and run operations more efficiently. But the discipline matters as much as the ambition: the return on any investment comes down to what it costs and the business outcomes it delivers.

The bigger challenge is translating successful pilots into value at scale: in our experience, only 4 in 10 AI pilots get there. A solution may work well in isolation, but its impact is limited if the surrounding workflows, systems and handoffs remain unchanged. Fragmented data, legacy infrastructure and insufficient attention to data quality and governance can further undermine efforts to replicate those results across the organisation. Scaling AI is therefore as much an organizational challenge as a technology one.

Business ownership is equally important. When objectives are unclear or accountability is divided between technology and business teams, even a promising solution can stall. The organizations making progress are those that begin with a clearly defined business problem, agree on who owns the outcome and redesign the processes needed to deliver it. Across healthcare and life sciences, we find that the difference between a successful pilot and sustained value often lies in how well AI is integrated into day-to-day decisions and work.

How is AI moving beyond R&D to solve critical operational risks like drug stockouts and demand forecasting?

AI's role in pharma is extending well beyond R&D into supply chain and manufacturing, where it is helping companies address one of the industry's most persistent operational risks: anticipating where demand and supply are likely to diverge, and acting before product availability is affected. By bringing together data across demand, inventory, manufacturing and distribution, AI can improve forecast accuracy, identify emerging stockout risks and support better decisions on production and inventory allocation.

The bigger opportunity lies in connecting these capabilities across the supply chain rather than solving individual planning problems in isolation. When forecasting, risk detection and operational decision-making work together, companies can respond faster to changing demand and supply disruptions while balancing product availability with inventory costs.

We see growing evidence of business value in this area. ZS's latest research shows that the share of pharma and biotech organizations reporting measurable outcomes from data, digital and AI investments in supply chain and manufacturing rose from 29% to 53% in a year. Among those seeing the strongest results from AI, are also giving it more responsibility. Nearly

75% of them let AI make decisions within clear limits in supply chain and manufacturing, compared with about 50% of other companies. The next step is to embed AI more deeply into planning and execution, with strong data foundations and governance, and with people clearly in charge of the decisions that matter most.

What sets Agentic AI apart from standard AI tools, and how will it change day-to-day execution for pharma and biotech companies?

The key difference is that conventional AI tools typically generate insights or recommendations, while agentic AI can also coordinate tasks and act within defined boundaries. Agents can work through a sequence of steps, use approved tools and trigger workflows. With appropriate feedback and monitoring, those systems can also learn from outcomes to improve future recommendations.

In day-to-day execution, agents can monitor signals, identify relevant changes, recommend next-best actions and initiate approved workflows. This reduces manual handoffs and gives teams more time for exceptions and decisions requiring judgment. We see this with ZAIDYN, ZS's life sciences intelligence platform powered by agentic AI, which applies specialized agents across commercial, medical, patient and content workflows. For example, ZAIDYN Content has helped expedite more than 100,000 content assets across brands, markets and languages, reducing cycle time for personalized and derivative content by more than 67%.

The bigger opportunity is to build connected decision systems, rather than automating individual activities. Across supply chain, clinical development and patient engagement, organizations can link how they sense changes, make decisions, act and learn from results. In regulated pharma workflows, this requires clear decision rights, approval and escalation processes, and ongoing monitoring. Agents can execute within those guardrails, while people retain accountability for scientific, clinical and compliance-sensitive decisions.

What must pharma & biotech firms do to make their data genuinely "AI-ready"?

AI-ready data is not simply more data, or even cleaner data. For pharma and biotech companies, it rests on three priorities: making data accessible across the enterprise, giving it the context AI needs to interpret it, and building trust and governance in from day one.

The first is access. Authorised users and systems need to be able to find, connect and reuse data across applications. That creates a foundation for AI that extends well beyond individual pilots.

The second is context. AI has to understand what the data means, how information relates across functions and which scientific and business rules apply. Metadata, lineage and domain knowledge are essential, as is making scientific context, institutional knowledge and decision history accessible in a governed way. That means bringing together structured and unstructured information from clinical, commercial and other functions.

The third is trust, and it has to be built in from the outset. Data quality, access controls, privacy, regulatory compliance and clear ownership all belong in the foundation. With that in place, shared data, context and retrieval layers can support multiple AI applications without rebuilding the same capabilities for every use case. Ultimately, being AI-ready means making an organization's knowledge and data usable, reliable and available to the right people and systems, within appropriate safeguards.

Over the next 3–5 years, which stage of the pharma value chain will see the biggest AI-driven transformation?

R&D and clinical development are likely to see the most significant AI-driven transformation over the next three to five years. AI is beginning to address persistent challenges in drug development, particularly the time, cost and complexity of moving from discovery to clinical evidence. ZS's 2026 outlook also points to increased investment in AI, digital and data capabilities across these functions.

AI is influencing how companies identify drug targets, discover molecules, design and conduct trials, analyse clinical data and prepare regulatory submissions. Clinical development stands out because of the time and resources involved. ZS's modeling suggests that, as silico methods mature, regulatory acceptance grows and adoption expands, they could eventually reduce clinical trial costs by as much as 60% and shorten cycle times by up to 40%. These are projected opportunities; not typical results achieved across the industry today.

The larger change is a more connected, predictive approach to R&D. By bringing together data, digital twins, simulation and feedback from earlier decisions, organizations can refine trial designs, improve portfolio choices and strengthen evidence generation. The measure of success will be whether these approaches help promising therapies reach patients more

efficiently while maintaining scientific rigor and patient safety.

What are your views on AI-driven drug discovery reaching the market?

A therapy discovered or designed with AI reaching patients would be an important milestone. It would show that AI can contribute to creating viable therapeutic candidates, not just making R&D processes more efficient. The standard of evidence, however, remains the same. Any therapy must demonstrate safety, efficacy, reproducibility and meaningful clinical benefit, with scientific validation and regulatory reviews determining whether it reaches the market.

One promising direction is more personalised therapeutic design. Combining AI with genomic and patient-level data may help researchers identify disease targets and develop approaches tailored to the biology of specific patient groups. The potential is significant, but any resulting benefits will still need to be established through rigorous research and clinical evidence.

The longer-term test is whether these results can be repeated. One successful AI-designed therapy is an important proof point; the next question is whether these approaches can consistently identify better-targeted candidates and improve the likelihood of clinical success. That depends on sound biological evidence, reproducible methods and learning from outcomes across development programs. If those conditions are met, AI could become integral to therapeutic design, rather than remaining a tool used during discovery.

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