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AI Takes India Pharma Reins

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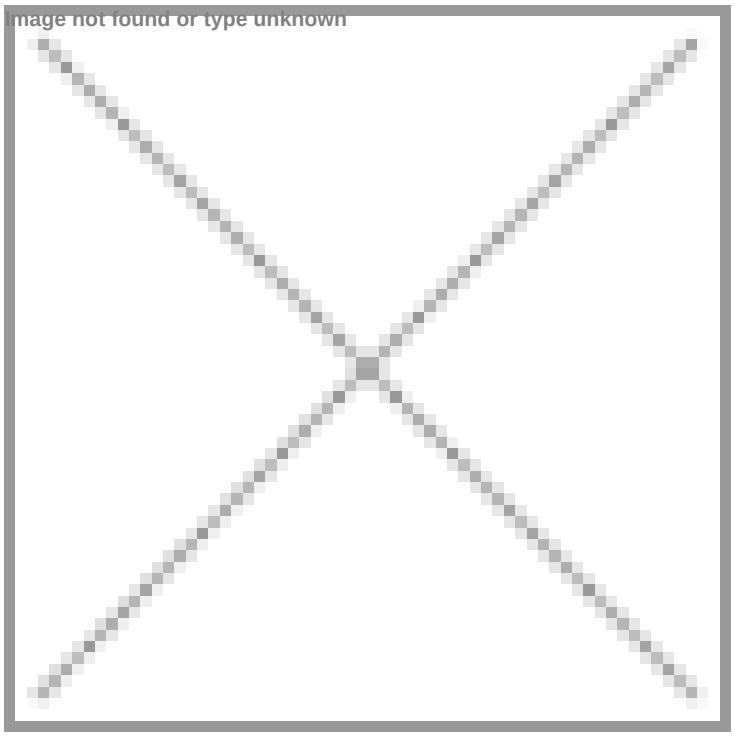
The Indian pharmaceutical sector, one of the largest in the world, is undergoing a strategic transformation in the way it operates. As artificial intelligence (AI) gains prominence across the industry, companies are actively adopting AI-driven solutions to enhance efficiency across the entire pharmaceutical ecosystem. Organisations are investing in AI training programmes to keep their workforce future-ready, foster innovation, strengthen supply chains, and transition away from manual record-keeping. In this industry analysis, experts share their perspectives on how AI is shaping the future of the pharma sector.



AI may be the buzzword of the moment, but in reality it represents a structural shift rather than a standalone technology. It is emerging as an enabling layer across the pharmaceutical value chain — from drug discovery and clinical development to manufacturing and patient engagement.

While AI is widely touted as transformative for the pharma industry, its adoption is not without caveats. There are several ifs and buts around data quality, regulatory expectations, integration with legacy systems, talent readiness, validation standards, and cultural acceptance. The promise is significant, but real impact will depend on how thoughtfully and responsibly the technology is implemented.

On the sidelines of three big events related to the pharma sector recently viz, AI India Impact Summit in New Delhi, BioAsia 2026 in Hyderabad and IPA Summit in Mumbai, pharma stalwarts all agreed to one fact that embracing AI is the only option as it will not only help the sector rise to newer heights but also make people gain more knowledge and work faster. However, a few experts gave a worrying outlook where questions on the job at stake lingered.

While concerns around employment continue to surface in industry discussions, the broader consensus among experts is that AI adoption is no longer optional. Beyond the headlines and speculation, the real driver for adoption lies in the tangible advantages AI offers across research, development, regulatory processes, and manufacturing operations. Understanding why companies are investing heavily in AI provides greater clarity on the sector's long-term strategic direction.

Why leverage AI?

AI has a huge role to play in the pharma industry. Ranging from drug discovery, a formulation scientist's assistant, a manufacturing optimiser, a clinical trial accelerator, a regulatory tool, a safety surveillance system etc, AI is being touted as a game changer for the pharma sector.

Generative AI and molecular simulation tools can explore chemical space orders of magnitude faster than bench chemistry allows, and the first AI-designed drug candidates have already entered human clinical trials.

On one hand where the industry loses enormous value to late-stage trial failures that could potentially have been predicted earlier, AI has a much larger role to play.

Even the FDA published draft guidance in 2025 on using AI to support regulatory decision-making for drug and biological products. AI-assisted literature review, benefit-risk modelling, and labelling are becoming part of the submission workflow.

As the potential of AI becomes clearer, leaders across India's pharmaceutical ecosystem are increasingly outlining how these technologies could reshape the way companies operate. Several senior executives emphasise that while the opportunity is enormous, successful adoption will depend on organisational readiness, workforce transformation, and a willingness to rethink traditional ways of working.

What the pharma stalwarts are saying?

Pharma stalwarts while being optimistic about the role of AI that needs to be embraced also urged the need to upskill the workforce.

According to **Dilip Shanghvi, Executive Chairman, Sun Pharmaceutical Industries,** there is an enormous opportunity to look at AI. He mentioned using AI to identify the root causes, for identifying the right CAPA (Corrective and Preventive Action). "We can immediately embrace it and it will help us make our product more consistently and also possibly at much better cost. All of this level requires a change in culture," says Shanghvi.

Adding to it, **Sharvil Patel, Managing Director, Zydus Lifesciences & President, Indian Pharmaceutical Alliance (IPA)** , says "Everyone will have to find new skill sets, new skilling capabilities, new ways of doing things, new ways of using knowledge rather than brute force and repetitiveness. You have to go AI tech with the enterprise mindset. AI will completely revolutionise ERP systems. So, AI will truly transform the manufacturing sector and other sectors all around. We all have to get re-skilled, including at the very top. These will lead to significantly better efficiencies in terms of speed and time to do a manufacturing process including technology."

Lilly has made significant investments in this space and recently opened a new centre in Hyderabad dedicated to technology and AI. According to **Winselow Tucker, Senior Vice President and Chief Commercial Officer, Loxo Oncology, Lilly,** AI is accelerating innovation across the pharmaceutical value chain. The real question is not just how quickly we can innovate, but how we can bring that innovation to market in a way that delivers a more personalised experience for patients.

Sudarshan Jain, Secretary General, Indian Pharmaceutical Alliance (IPA) emphasises that AI represents affordable innovation at scale, and embarking on that journey could be a transformative starting point for India's pharmaceutical sector. While the industry continues to strengthen quality standards and manufacturing capabilities—areas where quick wins are possible—he stressed that the larger priority must be advancing affordable innovation.

Nilesh Gupta, Managing Director, Lupin mentions, “To unlock India’s healthcare potential, we must innovate relentlessly. By placing AI at the forefront of transformation, India can redefine global manufacturing standards and emerge as a healthcare leader by 2047.”

While providing his outlook on AI, **Madan Mohan Reddy, Whole-Time Director at Aurobindo Pharma** , shares that global credibility—particularly with regulators—must be continuously reinforced rather than taken for granted. The adoption of AI is set to become inevitable. Sustaining operational continuity without AI will be difficult highlighting that regulators increasingly demand greater data transparency and tighter oversight.” He argued that manufacturing must transition to fully digital systems, where real-time analytics replace manual, retrospective reviews.

While industry leaders highlight the importance of adopting AI, the responsibility of preparing the next generation of professionals also falls on academic institutions and specialised training bodies. Universities and skill-development platforms are increasingly integrating AI into their curricula to ensure that future pharmacists and researchers are equipped to work in an AI-enabled healthcare ecosystem.

Role of institutions

For India, which supplies roughly 20 per cent of the world's generic medicines, getting AI-enabled Quality by Design right is not just an academic interest; it is a supply chain imperative.

JSSAHER JSS College of Pharmacy, Mysuru is engaging students with AI as a support tool for future pharmaceutical research. The institute has established a dedicated AI Unit within JSS College of Pharmacy. A white paper was also released covering responsible AI in pharmacovigilance, Software as a Medical Device, biomarkers, and data governance. That is not the output of an institution that is tentatively exploring AI.

The institute has revised the pharmacy curriculum to include AI, ensuring that the graduates are equipped for the evolving landscape of medicine.

Says, **Dr TM Pramod Kumar, Dean, Faculty of Pharmacy & Principal, JSS College of Pharmacy, JSS Academy of Higher Education & Research (JSSAHER),** “Our curriculum reforms, industry partnerships, AI Unit, and research collaborations are all oriented toward producing graduates who will not merely survive the AI transition but will drive it. We believe the pharmacy profession, with its unique combination of clinical knowledge, drug expertise, and patient-centered care, is exceptionally well positioned to assume leadership roles in the AI-enabled healthcare ecosystem of tomorrow.”

Similarly Pharmaceutical Academy for Global Excellence (PAGE), an initiative of the Indian Pharmaceutical Alliance, being promoted by 13 top pharma companies, has been formed with the objective of setting up a worldclass, cutting edge institute to provide state-of-the-art training to fresh pharmacy graduates and existing employees of leading pharma companies, thereby promoting a culture of manufacturing and quality excellence. At present, PAGE is developing various courses based on virtual reality (VR), where participants will have the chance to: Explore equipment and processes in immersive environments, undergo SOP training with gamification elements, experience post training assessments enhanced by AI.

Dr Pranav Jogani, Professor Consultant, Pharmaceutical Academy for Global Excellence (PAGE) mentions, "We are seeing great potential of AI in the area of post training assessment. With the help of AI, we will generate dynamic scenarios to test participants in real time. I see great potential for AI in addressing concerns in critical areas such as data integrity, compliance, and patient safety. I would like to see AI applied more and more in preventing errors, ensuring real-time quality assurance, and supporting workforce training and knowledge."

Beyond workforce training, industry analysts are also observing a deeper structural shift taking place across the pharmaceutical ecosystem. Strategic reports and research studies suggest that AI is not only improving individual processes but is fundamentally reshaping how innovation, manufacturing, and supply chains interact within the industry.

Reshaping speed and decision-making

EY-Parthenon India launched its latest report “Pharma’s New Architecture: Where Novel Science Meets AI and Manufacturing Power” at Bio Asia 2026. The report highlighted that the industry is moving beyond incremental product development toward platform-led innovation models that integrate discovery science, AI-native R&D, advanced manufacturing and resilient supply chains into unified systems.

Elaborating more on the report, **Suresh Subramanian, National Lifesciences Leader, EY Parthenon India** said, “Indian biopharma is undergoing a structural reset. Scientific breakthroughs alone are no longer enough. The winners will be those who integrate discovery, AI-native intelligence and manufacturing into disciplined, repeatable platforms. The shift from one-off products to reusable engines – from mRNA and CRISPR to AI-driven design stacks – is redefining speed, reliability and scale. It is about building systems that compound learning and consistently deliver therapies to patients. This will help India pivot to large molecules and new modalities where the larger opportunities moving forward will emerge.”

During Bio Asia 2026, **Shakthi Nagappan, CEO, Telangana Lifesciences** said that the life sciences sector is being reshaped by a deeper integration of biology and digital technologies. He mentions, “As research becomes more data-intensive, AI and advanced analytics are helping bridge the gap between discovery and real-world application — accelerating insight while maintaining scientific rigour. This shift extends beyond R&D into clinical development and manufacturing, creating more coordinated and resilient systems.”

At the same time, technology providers are developing practical AI-driven platforms designed to address everyday operational challenges in pharmaceutical manufacturing and compliance. These solutions aim to simplify workflows, reduce human errors, and improve regulatory readiness.

Simplifying pharma manufacturing

AI powered platform Leucine simplifies pharmaceutical manufacturing, making it faster, fully compliant, and always audit-ready. The company helps to streamline workflows, reduce errors, and achieve lasting excellence in pharma production. LeucineOS connects 16 applications across the manufacturing compliance workflow - from batch execution through cleaning validation, training, environmental monitoring, deviation management, change control, and quality release - on a single data platform with purpose-built AI agents that operate inside the compliance context.

Vivek Gera, CEO, Leucine mentions, “The pharmaceutical industry is right to be excited about AI. The technology is genuinely transformative. AI that generates a report which a human must then act on adds a step. Most pharmaceutical manufacturers are trying to layer AI on top of fundamentally disconnected systems. The result is a copilot that accelerates paperwork - not an agent that prevents compliance failures.”

CitiusTech brings healthcare ready AI to pharma and health organisations by combining deep clinical and operational expertise with advanced data, cloud, and engineering capabilities. The AI platform CitiusTech Knewron helps teams work faster and smarter with copilots, taskspecific agents, clinical information extraction, automated testing, and more than 100 healthcare accelerators.

Says **Srinath Rao, EVP, CitiusTech**, "We expect to see deeper use of agent?driven automation, domain?specific models, and policy?aware AI systems that work reliably in real clinical and operational settings. Healthcare and pharma will increasingly rely on AI systems that can interpret multimodal data, encode clinical and regulatory knowledge, and work safely within high?stake environments. The shift will come from understanding entire value chains rather than building disconnected use cases."

Despite these technological advancements, the rapid adoption of AI has also sparked anxiety among sections of the pharmaceutical workforce. Concerns around automation and potential job losses continue to surface in industry discussions and conferences.

Will AI reduce employment opportunities

Panic has set in among the major work force in the pharma sector. With random Chinese whispers and a few sections of the industry openly announcing that AI will gobble up jobs has raised eyebrows among many. At one of the pharma conferences held in Mumbai, one expert was critical about jobs being taken away by AI.

That AI will transform and not eliminate pharmaceutical employment is what should ponder over.

Routine, high-volume, and repetitive tasks such as manual data entry in pharmacovigilance case processing, literature screening, MedDRA coding, and basic quality checks will increasingly be automated.

Pharmacists and scientists can focus their expertise toward complex clinical decision-making, safety signal interpretation, regulatory strategy, and patient engagement—activities where human judgment, ethical reasoning, and contextual knowledge remain irreplaceable.

And all these can be achieved when an employee can embrace AI, get more educated on recent AI tools and keep a positive outlook.

According to **Amit Sheth, Founding Director, India AI Research Organisation (IAIRO) & Professor, University of South Carolina**, the pharma sector is one of the highest R&D-investing industries globally. The value creation potential is enormous, and AI can have an immediate and measurable impact."

Sheth outlined three priorities:

- First, to create world-class AI talent in India.
- Second, to generate original intellectual property and move rapidly from research to products.
- Third, to work with startups and corporations to create near-term economic impact.

Historically, technological shifts in pharma — from automation in manufacturing to digital clinical trials — have led to role evolution rather than large-scale displacement. This according to **Joydeep Ghosh, Life Sciences & Healthcare Industry Leader, Deloitte India** will increasingly move toward higher-value analytical roles, cross-functional digital capabilities and human-AI collaboration models over the next 10–20 years. The key will be reskilling and upskilling to ensure talent evolves alongside technology.

Ghosh adds, "The principal challenge is availability of data on several fronts, in the right quality, quantity, granularity and timeliness. One example is fragmented healthcare data, which is scattered across different healthcare providers, laboratories, insurance companies, and pharmaceutical companies. The data is often stored in different legacy systems with limited interoperability."

Beyond workforce concerns, another major challenge for AI adoption lies in organisational readiness. Many pharmaceutical companies are experimenting with AI tools, but integrating them into existing processes, governance structures, and decision-making frameworks remains a significant hurdle.

Organisational readiness

The reality is that most pharma companies are already leaning heavily into AI, but the real bottleneck is not the technology, it is organisational readiness. Legacy workflows, siloed data structures, and traditional team models were never designed for AI-native ways of working.

Says **Dr Purav Gandhi, Founder and CEO, Healthark**, "The challenge today is less about adopting AI tools and more about reorienting processes, governance, and talent structures to embed AI seamlessly into day-to-day decision-making. The transition will not happen overnight, but over a 10 to 20 year horizon it will become deeply integrated into how organisations operate. Importantly, history tells us that such shifts do not necessarily eliminate jobs, they reshape them. When ATMs were introduced, there was widespread fear that bank jobs would disappear. Instead, banks evolved, routine tasks were automated, and employees moved to higher value, relationship-driven and advisory roles."

Taken together, the perspectives of industry leaders, analysts, academic institutions, and technology providers point to a common conclusion: AI is not merely another digital tool but a foundational shift in how the pharmaceutical industry will operate in the future.

Embracing AI holds the key

On how quickly and deliberately Indian pharma can use AI to shift from world's largest supplier by volume to its most valuable innovation hub.

People will need to get reskilled. According to experts, future plants will have less human interaction and AI will have a major role to play. One has to build the capability to manage future compliance. Adopting the capability will lead India to become the most trusted manufacturing powerhouse.

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